Contract Program or Project Title:	Inservice Testing Program
Subject of this Document:	Recommendations to the NRC for the Safety Evaluation Report of Browns Ferry Nuclear Plant - Unit 3
Type of Document:	Informal Report
Author(s):	V. Lettieri, T. Restivo, and R.E. Hall
Date of Document:	July 1979
Responsible NRC Individual and NRC Office or Division:	Dr. Cy Cheng Division of Operating Reactors U.S. Nuclear Regulatory Commission Washington, D.C. 20555

This document was prepared primarily for preliminary or internal use. It has not received full review and approval. Since there may be substantive changes, this document should not be considered final.

Brookhaven National Laboratory
Upton, NY 11973
Associated Universities, Inc.
for the
U.S. Department of Energy

Prepared for
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555
Under Interagency Agreement EY-76-C-02-0016
NRC FIN No. A-3117

INTERIM REPORT

LIMITED DISTRIBUTION

BNL-NUREG26583
INFORMAL REPORT

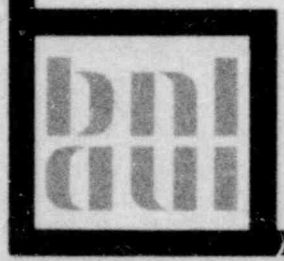
RECOMMENDATIONS TO THE NRC FOR THE SAFETY EVALUATION REPORT OF BROWNS FERRY NUCLEAR PLANT - UNIT 3 REVISION 1

INSERVICE TESTING PROGRAM

V. LETTIERI, T. RESTIVO, AND R.E. HALL

ENGINEERING AND ADVANCED REACTOR SAFETY DIVISION

DATE PUBLISHED - JULY 1979
DEPARTMENT OF NUCLEAR ENERGY BROOKHAVEN NATIONAL LABORATORY
UPTON, NEW YORK 11973



Prepared for the U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Contract No. EY-76-C-02-0016

BNL-NUREG-26583
INFORMAL REPORT
LIMITED DISTRIBUTION

Recommendations to the NRC for the Safety Evaluation Report of Browns Ferry Nuclear Plant - Unit 3 Inservice Testing Program Revision 1

V. Lettieri, T. Restivo, and R.E. Hall

Engineering and Advanced Reactor Safety Division
Department of Nuclear Energy
Brookhaven National Laboratory
Upton, New York 11973

July 1979

Prepared for
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
Under Interagency Agreement EY-76-C-02-0016
NRC FIN No. A-3117

NOTICE: This document contains preliminary information and was prepared primarily for interim use. Since it may be subject to revision or correction and does not represent a final report, it should not be cited as reference without the expressed consent of the author(s).

TABLE OF CONTENTS

999 007

Brookhaven National Laboratory
Recommendations to the NRC for the
Safety Evaluation Report of
Browns Ferry Nuclear Plant - Unit 3
Tennessee Valley Authority
Inservice Testing Program
For the 1978-1980 Period
(Docket No. 50-296)
(Submittal dated May 25, 1977)

Executive Summary

Under contract to the Nuclear Regulatory Commission (NRC), the Reactor Engineering Analysis Group of Brookhaven National Laboratory (BNL) has conducted a review of the following Browns Ferry - Unit 3 Inservice Testing Program submittals:

a. May 25, 1977, the Tennessee Valley Authority's (TVA) letter to E.G. Case (NRC) describing the IST Program.

b. Revisions to the May 25, 1977 letter dated August 15, 1977, October 18, 1977, January 24, 1978, and June 26, 1978.

c. BNL-NUREG-25450, Informal Report "Recommendations to the Staff on Browns Ferry Nuclear Plant - Unit 3" dated August 1978.

d. September 29, 1978, the TVA's letter to T. A. Ippolito (NRC) describing the revised IST program as a result of the August 15 and 16, 1978 meeting between the TVA, NRC, and BNL.

e. Revisions to the September 29, 1978 letter dated November 22, 1978, January 29, 1979, March 6, 1979, and June 4, 1979.

The BNL review process included the Safety Evaluation Review (SER) meeting held at Bethesda, Maryland on August 15 and 16, 1978. Attendees were personnel from the plant, NRC and BNL. Mr. T.J. Restivo (consultant to BNL) and Mr. V. Lettieri (BNL) represented BNL.

The recommendations made in this report are based on evaluations which considered: Practicality within limitations of equipment design and geometry, requirements of Section XI of the 1974 Edition thru Summer of 1975 of the ASME Boiler and Pressure Vessel Code, 10 CFR 50.55a(g), NRC Staff Guidance Letters (November 1976 and January 1978), and topics of numerous NRC Staff/BNL briefings.

The licensee has requested that Code relief be granted for 9 pump test items and 14 valve items. Also that, Cold Shutdown Testing be approved for 31 other valves.

This report recommends that Code relief be granted for 4 of the 9 pump items and 9 of the 14 valve items.

Also recommended is that Cold Shutdown Testing be approved for all of the valves against which this request was made.

999 008

1.0 PUMPS, INSERVICE TESTING PROGRAM

1.1 All Pumps

1.1.1 Relief Request: The requirements of Section XI for declaring a pump inoperable if deviations fall within the "Required Action Range" (IWP-3230(c)) will not be adhered to.

Code Requirement: If the deviations fall within the "Required Action Range" of Table IWP-3100-2, the pump shall be declared inoperative and not returned to service until the condition has been corrected.

Licensee Basis for Relief Request: Due to the possibility of instrument problems, and the difficulty of obtaining the precision necessary under Section XI, and the burden placed on the licensee of performing various other surveillance instructions when unjustifiably declaring equipment inoperable, this requirement should be altered.

Alternate Testing - If a pump parameter falls within the "Required Action Range," the Shift Engineer and Cognizant Engineer will be immediately notified to determine if an instrumentation problem exists. Instruments will be checked and the test rerun. If results of this test are comparable to the previous test, the results will be immediately analyzed versus safety analysis limits to determine acceptability. If the new values are not acceptable, the pump will be declared inoperable. If the new values are acceptable, a new set of reference values will be established.

Evaluation: The intent of the Code is that when test results show deviations greater than allowed by Table IWP-3100-2, the instruments involved may be recalibrated and the test rerun. If the second test provides results falling with the "Required Action Range" of Table IWP-3100-2 then the condition must be corrected. The intent of the Code is for correction to be either replacement or repair per IWP-3111, or to be an analysis to demonstrate that the condition does not impair pump operability and that the pump will still fulfill its function. A new set of reference values shall be established after such an analysis. This analysis and its results shall be forwarded to the NRC for review within four working days from the completion of the analysis.

It is recommended that this relief request meets the intent of the Code should it follow the clarification of the Code as presented in this evaluation, in conjunction with the proposed alternate testing as described in the "Licensee Basis for Relief Request."

999 009

Therefore, it is recommended that relief be denied until such time as the licensee agrees to meet the suggested procedures outlined in this evaluation.

1.1.2 Relief Request: Pump parameters of flow rate and differential pressure will be reviewed immediately after the test to verify that they do not fall within the "Required Action Range" of Table IWP-3100-2. Complete analysis of test data will be performed within 4 working days of the test.

Code Requirement: Analysis of test data within 96 hours per IWP-3220.

Licensee Basis for Relief Request: Due to the time involved in processing surveillance of weekends and/or holidays falling between running tests and completely reviewing the results, 96 hours is impractical.

Evaluation: The licensee should review immediately (within 96 hours after the test) all pump parameters as is required by the Code, to verify that they do not fall within the "Required Action Range" of Table IWP-3100-2. Those that do fall within the "Required Action Range" are to be processed as described in item 1.1.1 of this report. Those that do not fall within the "Required Action Range," it is recommended, that relief be granted to allow analysis within four working days after completion of a test. This request, for those pump parameters not falling within the "Required Action Range," meets the intent of the Code.

1.2 RHR, RCIC, Core Spray, and RHRSW pumps

1.2.1 Relief Request: The inservice test quantities for the RHR, RCIC, Core Spray (ASME Code Class 2) and RHRSW (ASME Code Class 3) pumps will be measured quarterly instead of monthly in accordance with IWP-3400.

Code Requirement: An inservice test shall be run on each pump, nominally each month during normal plant operation. Each inservice test shall include measurement and observation of all quantities in Table IWP-3100-1 except bearing temperatures which shall be measured during at least one inservice test each year.

Licensee Basis for Relief Request: Quarterly flow testing of these pumps has been a technical specification requirement for these pumps. A three page table is presented in "Request for Relief PV-5" providing data consisting of flow rate and pressure, the data are for the time period of August 5, 1977 to August 25, 1978. These tests have shown no significant changes in performance characteristics every 3 months. Monthly testing, therefore, would not significantly increase plant safety. These pumps are presently run monthly to prove operability. The pumps are standby pumps whose continuous operation is not required.

999 010

In addition, monthly testing would require at least an additional 100 manhours per year for vibration monitoring; at least an additional 56 manhours per year for pump operation; and at least an additional 17 manhours per year for data reduction, analysis, and record keeping. This amounts to a conservative estimate of 173 manhours per year for unit 3. When Section XI becomes applicable to units 1 and 2, this becomes 519 manhours per year. At a conservative total cost of $20/manhour, this amounts to $10,380/year.

Based on an average exposure rate of ≈ 5 mrem/hr in the areas of these (all but RHRSW) pumps, the total man-rem exposure per year is approximately 1.5 man-rems. At present industry cost of exposure of ≈$10,000/man-rem to plant personnel, this exposure costs an additional $15,000/year.

Total cost to TVA and our rate payers is $25,400/year, for no increased safety.

Alternate Testing - Pumps will be tested in accordance with ASME Section XI quarterly with pump operability tests monthly.

Evaluation: This practice does not meet the requirements of Section XI of the ASME B&PV Code. The licensee has indicated that this imposes an undo hardship; however, the licensee's submittal does not have sufficient documentation to justify full relief from Code requirements. The data the licensee presents to show "no significant changes in performance characteristics every three months" for the pumps listed cannot be verified. Using the Code rules and IWP-3100-2 criteria, it is not possible to verify the licensee's claim since no reference valves are provided. It is not clear from the data presented whether or not the requirements of IWP-3111 or IWP-3112 have been fulfilled for those items with asterisks.

The licensee states The pumps are standby pumps whose continuous operation is not required." As presented, it is not possible to determine the extent to which these pumps are in actuality operated. If the data presented can be shown to support the licensee's claim by utilizing Code procedures (reference valves established, readings taken from in-line tests, etc.), by meeting Code criteria as required by Table IWP-3100-2, and pump operation is equal to or less than approximately 2800 hours (about one-third continuous operation) a relief request could be recommended.

The intent of the Code in specifying flow testing measurements is to detect wear of of hydraulic components. The Code does not differentiate between degrees of yearly operation, the requirements include the most severe case -- continuous operation. A pump that is operated less than or equal to 33 percent of the time, on a yearly basis, can meet the intent of the Code without monthly Code testing provided documentation can be presented supporting the data taken over a significant period of time using three month test intervals demonstrates no significant changes in pump performance. In the

event the above can be justified, it could be recommended, that relief be granted to permit a Code required test quarterly, provided the pumps are given a monthly operability test. This monthly operability test is to include verification that the pump comes up to nominal speed and verification, in the case of oil lubricated units, that the lubrication system is functioning properly. This relief would be recommended in lieu of Section XI requirements. Until such time as the above recommendation can be complied with, it is recommended that this relief request be denied.

1.2.2 Relief Request: The bearing temperatures on the RHR, RCIC, Core Spray and RHRSW (ASME Code Class 3) pumps will not be measured in accordance with Section XI Requirements.

Code Requirement: Bearing temperature shall be measured during at least one inservice test each year.

Licensee Basis for Relief Request: For the RHR, RCIC, Core Spray and RHRSW pumps, instrumentation is not available to monitor the bearing temperature. Proper operation is verified by the other inservice test quantities which are measured.

All of these pumps, except RCIC, have water lubricated pump bearings. The RHR, Core Spray, and RHRSW pump bearings are lubricated by water supplied by the pump itself. Satisfactory pump operation is indicative of sufficient bearing lubrication. The RCIC pump has oil cooled bearings, but this pump can't be operated long enough to reach stable bearing temperatures without overheating the torus and causing plant shutdown. RCIC bearings do not have temperature instrumentation.

Evaluation: During normal plant operation or hot shutdowns, the RCIC pumps cannot be operated for a time period long enough to meet the Code requirements for measuring bearing temperature. These pumps use steam driven turbines, discharging the spent steam into the torus. Running these pumps for the 30 minute minimum time period required by the Code for measuring bearing temperature would cause the torus water temperature to elevate above technical specification limits. During cold shutdowns there is insufficient steam available to enable testing the pumps at the operational conditions necessary for measuring bearing temperature.

The RHR, RCIC, Core Spray and RHRSW pumps do not have instrumentation available to directly measure bearing temperature. The bearings on these pumps are water lubricated/cooled by the use of system water.

Based on the above statements, we conclude that it is not practical to obtain bearing temperatures as required by the Code. In addition, other pump parameters including vibration are measured as required by the Code, indicating pump performance and bearing conditions. Therefore, we recommend that relief be granted not to measure bearing temperature of the RHR, RCIC, Core Spray and RHRSW pumps.

999 012

1.3 HPC. Pumps

1.3.1 Relief Request: The inservice test quantities for the HPCI pumps will be measured quarterly instead of monthly in accordance with IWP-3400.

Code Requirement: An inservice test shall be run on each pump, nominally each month during normal plant operation. Each inservice test shall include measurement and observation of all quantities in Table IWP-3100-1 except bearing temperatures which shall be measured during at least one inservice test each year.

Licensee Basis for Relief Request: See Licensee Basis for Relief Request Item 1.2.1.

Evaluation: See Evaluation Item 1.2.1.

1.3.2 Relief Request: The bearing temperatures on the HPCI pumps will not be measured in accordance with Section XI requirements.

Code Requirement: Bearing temperature shall be measured during at least one inservice test each year.

Licensee Basis for Relief Request: It is not possible to run the HPCI pump for a sufficient amount of time for the bearing temperature to stabilize without exceeding technical specification limits on torus water temperature. Proper operation is verified by the other inservice test quantities which are measured.

Evaluation: During normal plant operation or hot shutdowns the HPCI pumps cannot be operated for a time period long enough to meet the Code requirements for measuring bearing temperature. These pumps use steam driven turbines, discharging the spent steam into the torus. Running these pumps for the 30 minute minimum time period required by the Code for measuring bearing temperature would cause the torus water temperature to elevate above technical specification limits. During cold shutdowns there is insufficient steam available to enable testing the pumps at the operational conditions necessary for measuring bearing temperature.

The HPCI pump has provisions for measuring bearing temperature and measurements are taken. However, these measurements are taken before stabilized conditions are obtained as required by the Code. Some information is thus available on the bearings of the HPCI System, but is of questionable value.

Based on the above statements, we conclude that it is not practical to obtain bearing temperatures as required by the Code. In addition, other pump parameters including vibration are measured as required by the Code, indicating pump performance and bearing condition. Therefore, we recommend that relief be granted not to measure bearing temperature of the HPCI pumps.

1.4 Standby Liquid Control Pumps

1.4.1 Relief Request The duration of inservice tests for the Standby Liquid Control Pumps (ASME Code Class 2) will not be in accordance with the requirements of Section XI, IWP-3500(a).

Code Requirement: When measurement of bearing temperature is not required, each pump shall be run for at least five minutes under conditions as stable as the system permits. At the end of this time at least one measurement or observation of each of the quantities specified shall be made and recorded.

Licensee Basis for Relief Request: These pumps are tested by circulating liquid to a test tank for 3 minutes and measuring the volume change in the tank. Running for 5 minutes before measuring parameters is not compatible with the system design.

Evaluation: The intent of the five minute Code requirement is to prevent tests "on-the-fly," to allow time to bleed gages etc., if necessary, and to assure reasonably stable operating conditions. Relief could be recommended, provided the licensee can document that the three minute interval will allow adequate time to bleed, and otherwise prepare to make all required measurements and observations. Also, that the operating conditions as stable as the system permits can be maintained over the three minute period. The basis for recommending the granting of relief would be that the intent of Section XI requirements was met. However, until such time as above requested documentation is received, reviewed and approved, it is recommended that the relief requested be denied.

1.4.2 Relief Request: The bearing temperatures of the Standby Liquid Control (ASME Code Class 2) pumps will not be measured in accordance with Section XI requirements.

Code Requirement: Bearing temperature shall be measured during at least one inservice test each year.

Licensee Basis for Relief Request: Instrumentation is not available to measure the bearing temperature of the Standby Liquid Control Pumps.

Evaluation: The Standby Liquid Control Pumps do not have instrumentation available to directly measure bearing temperature. The bearings on these pumps are water lubricated/cooled by the use of system water.

Based on the above, we conclude that it is not practical to obtain bearing temperatures as required by the Code. In addition, other pump parameters including vibration are measured as required by the Code, indicating pump performance and bearing condition. Therefore, we recommend that relief be granted not to measure bearing temperature of the Standby Liquid Control Pumps.

999 014

1.4.3 Relief Request: Inlet pressure and differential pressure will not be measured for the Standby Liquid Control Pumps (ASME Code Class 2) in accordance with IWP-4000.

Code Requirement: Table IWP-3100-1 requires the measurement of inlet pressure or the pump and differential pressure across the pump.

Licensee Basis for Relief Request: These pumps take suction from a tank that changes level during pump operation. In addition, these are positive displacement pumps whose inlet pressure does not affect pump operating characteristics. Therefore, differential pressure measurement is also not important.

Alternate Testing - Pump discharge pressure will be measured during monthly testing.

Evaluation: The "Licensee Basis for Relief Request" is technically incorrect. If a pump, regardless of type, is presented at the inlet with fluid at an adequate pressure level, it will generate a fixed differential pressure at a specific flowrate, centrifugal pumps, or at a specific speed, reciprocating pumps. Thus pressure differential is the key parameter to watch to detect deterioration of performance. Since $\Delta P = P_d - P_i$, P_d is Pump Discharge Pressure at any speed for a reciprocating pump, $P_d = \Delta P + P_i$ or a constant - P_i. The licensee's statement that P_i does not affect P_d is incorrect as is his statement that "differential pressure measurement is not important."

If the licensee does not wish to measure ΔP directly or P_i and it is known that the minimum P_i (head tank at lowest level) always assures adequate P_i, he may measure for his reference values and for subsequent inservice tests P_d at reference speed. P_i will be reflected in P_d. The range limits of IWP-3100-2 for ΔP should be applied to P_d. If P_d is very large relative to P_i (or ΔP_i <<< 9% P_d) this may not present a problem. If ΔP_i = 9% P_d, the situation would be untenable.

Based on the assumption that minimum P_i (head tank at lowest level) always assures adequate P_i, relief from Section XI requirements could be recommended.

These pumps take suction from a head tank in which the liquid level changes as the pumps are operated. The minimum level assures that inlet pressure is greater than the minimum specified by the pump manufacturer. Pump discharge pressure shall be measured during monthly inservice testing and variations from the reference pressure shall be determined and processed as specified for differential pressure in Table IWP-3100-2. Since adequate inlet pressure is assured, Note 1 of Table IWP-3100-2 of the Code is satisfied. By applying the range limits specified for ΔP in Table IWP-3100-2 of the Code to discharge pressure, reduced range limits due to pump deterioration of performance result. This is permitted by IWP-3210

of the Code. Accordingly, relief could be granted to measure discharge pressure in lieu of Code required measurement of inlet pressure and differential pressure.

However, until such time as the licensee presents adequate documentation that assures that the minimum P_i (head tank at lowest level) always assures adequate P_i, a recommendation must be made to deny this relief request.

2.0 VALVES, INSERVICE TESTING PROGRAM

2.1 General

2.1.1 The scope of this review is limited to those valves which perform a safety-related function. Safety-related valves, for the purpose of IST, have been defined as those valves that are necessary to function to safely shut down the plant and/or mitigate the consequences of an accident. As a minimum, all valves that receive a containment isolation signal or a safety injection signal shall be included in the IST program.

2.1.2 The following are valves that are listed in the IST submittal with a test frequency of 60 months. This frequency, as stated, does not meet the Code. The frequency statement is in error. Relief has not been requested, reviewed or acted upon; therefore, all relief valves shall meet the requirements of IMV-3510.

2.1.2.1 Main Steam System

Valve	Category
1-501	C
1-537	C

2.1.2.2 Standby Liquid Control

Valve	Category
63-512	C
63-513	C

2.1.2.3 Reactor Core Isolation Cooling System

Valve	Category
71-543	C

2.1.2.4 High Pressure Coolant Injection System

Valve	Category
73-574	C

2.1.2.5 Core Spray

Valve	Category
75-507A	C
75-507B	C
75-507C	C
75-507D	C

2.1.3 The following valves were not included in the original IST program submitted directly; they were addressed in the form of "Requests for Relief." For the purpose of consistency, these valves are shown as being added to the IST program. At the SER meeting, these valves were deleted as nonsafety related.

2.1.3.1 Residual Heat Removal Service Water

Valve
23-601
23-603
23-605
23-607

2.1.3.2 Reactor Water Cleanup System

Valve
69-12

2.1.3.3 Reactor Core Isolation Cooling System

Valve
71-547
71-589

2.1.3.4 High Pressure Coolant Injection System

Valve
73-620
73-624
73-625
73-559

2.1.3.5 Residual Heat Removal System

Valve
74-698
74-706
74-669
74-674
74-680A
74-680B
74-691
74-76

999 018

2.1.4 The following are valves which were suggested to be CIV candidates at the SER meeting.

Valve
73-30
73-6[illegible]
71-[illegible]4
71-580
74-722

The following guidelines were developed after review of some initial IST programs.

2.1.5 Leak Testing of Valves which Perform a Pressure Isolation Function

There are several safety systems connected to the reactor coolant pressure boundary that have design pressures that are below the reactor coolant system operating pressure. It is required that there be redundant isolation valves forming the interface between these high and low pressure systems to prevent the low pressure systems from being subjected to pressures which exceed their design limits. In this role, the valves are performing a pressure isolation function.

The redundant isolation provided by these valves regarding their pressure isolation function is important. It is considered necessary to provide assurance that the condition of each of these valves is adequate to maintain this redundant isolation and system integrity. For this reason it is believed that some method, such as a leak testing, should be used to assure their condition is sufficient to maintain this pressure isolation function.

In the event that leak testing is selected as the appropriate procedure for reaching this objective, the staff believes that the following valves should be categorized as A or AC and leak tested in accordance with IWV-3420 of Section XI of the applicable edition of the ASME Code. These valves are:

43-13	Sampling and Water Quality
43-14	Sampling and Water Quality
71-39	RCIC
71-40	RCIC
73-17A	HPCI
73-17B	HPCI
73-6A	HPCI
73-6B	HPCI
73-23	HPCI
73-24	HPCI
73-44	HPCI

73-45	HPCI
74-47	Reactor Heat Removal
74-48	Reactor Heat Removal
74-53	Reactor Heat Removal
74-54	Reactor Heat Removal
74-67	Reactor Heat Removal
74-68	Reactor Heat Removal
74-77	Reactor Heat Removal
74-78	Reactor Heat Removal
74-661	Reactor Heat Removal
74-662	Reactor Heat Removal
75-25	Core Spray System
75-26	Core Spray System
75-53	Core Spray System
75-54	Core Spray System

We have discussed this matter and identified the valves listed above to the licensee. The licensee has agreed to consider leak testing these valves in accordance with IWV-3420 of the applicable edition of the ASME Code and to categorize these valves with the appropriate designation. If the licensee determines that leak testing is not necessary because there are other methods that the licensee has and will use to determine each valve's condition, the licensee will provide to the NRC for evaluation on a valve-by-valve basis the details of the method used that clearly demonstrates the condition of each valve.

2.1.6 Containment Isolation Valves

The Appendix J review for this plant is a completely separate review from this IST program review. However, the determinations made by that review are directly applicable to the IST program. The present IST submittal should be acceptable until the Appendix J review is completed. At that time, the licensee will be required to amend his IST program to reflect the conclusions of the Appendix J review.

2.1.7 Category A Valve Leak Check Requirements for Containment Isolation Valves (CIV)

All CIVs shall be classified as Category A valves. The Category A valve leak rate test requirements of IWV-3420 (a-e) have been superceded by Appendix J requirements for CIVs. The staff has concluded that the applicable leak test procedures and requirements for CIVs are determined by 10 CFR 50 Appendix J. Relief from paragraph IWV-3420 (a-e) for CIVs presents no safety problem since the intent of IWV-3420 (a-e) is met by the Appendix J requirements.

Sections f and g of IWV-3420 must be met by the licensee otherwise relief must be requested from these paragraphs. It should be noted that these paragraphs are only applicable where a type C Appendix J leak test is performed.

The safety function of CIVs and thus passive CIVs is to perform leak limiting barriers. These are valves, which are normally closed, thus in their safety position, and are not required to open to mitigate the consequences of an accident or to safely shutdown the plant. Therefore, the operability of these valves is inconsequential with regard to the safety function for which they perform. It is thus concluded that the quarterly stroke and stroke time measurement are meaningless for passive CIVs.

2.1.8 Stroke Requirements for Passive Valves

These valves are normally closed and thus in their safety-related position, and are not required to change position, that is to open or close to mitigate the consequences of an accident or to safely shutdown the plant. Therefore, the operability of these valves is inconsequential with regard to the safety function for which they perform. It is thus concluded that the quarterly stroke and stroke time measurement are meaningless for passive valves.

2.1.9 Valves to be Tested at Cold Shutdowns

Valve testing should commence not later than 48 hours after shutdown, and continue until complete or plant is ready to return to power. Completion of all valve testing is not a prerequisite to return to power. Any testing not completed at one cold shutdown should be performed during subsequent cold shutdowns to meet the Code specified testing frequency.

In the case of valves exercised less frequently than cold shutdown (i.e., refueling), relief from the Code requirement must be requested. These cases are treated as such in this review.

2.1.10 Valve Exercising Requirements

ASME Code, Section XI, Subsection IWV-3410(a) requires that Code Category A and B valves be exercised once every 3 months, with the exceptions as defined in IWV-3410(b-1), (e), and (f). IWV-3520(a) requires that Code Category C valves be exercised once every 3 months, with the exceptions as defined in IWV-3420(b). IWV-3700 requires no regular testing for Code Category E valves. Operational checks, with appropriate record entries, shall record the position of these valves before operations are performed and after operations are completed and shall verify that each valve is locked, or sealed. The limiting value of full stroke time for each power operated valve shall be identified by the owner and tested in accordance with IWV-3410(c). In the above exceptions, the code permits the valves to be tested at cold shutdown where:

a. It is not practical to exercise the valves to the position required to fulfill their function or to the partial position during plant operation.

b. It is not practical to observe the operation of the valves (with fail-safe actuators) upon loss of actuator power.

2.1.11 Changes to the Technical Specifications

In a November 1976 letter to the Browns Ferry Nuclear Plant, Unit 3, the NRC provided an attachment entitled "NRC Staff Guidelines for Excluding Exercising (Cycling) Tests of Certain Valves During Plant Operation." The attachment stated that when one train of a redundant system such as in the ECCS is inoperable, nonredundant valves in the remaining train should not be cycled since their failure would cause a loss of total system function. For example, during power operation in some plants, there are stated minimum requirements for systems which make up the ECCS which allow certain limiting conditions for operation to exist at any one time and if the system is not restored to meet the requirements within the time period specified in a plant's Technical Specification the reactor is required to be put in some other mode. Furthermore, prior to initiating repairs all valves and interlocks in the system that provide a duplicate function are required to be tested to demonstrate operability immediately and periodically thereafter during power operation. For such plants this situation would be contrary to the NRC guideline as stated in the document mentioned above.

The Browns Ferry Nuclear Power Station, Unit 3, Technical Specifications may have requirements that are contrary to the above mentioned guidelines. We have discussed this situation with the licensee and the licensee has agreed to review the Technical Specifications and to consider the need to propose Technical Specification (TS)changes which would have the effect of precluding such testing.

If, after making this consideration, the licensee determines that the TS should not be changed because the guidelines are not applicable or if that the guidelines cannot be followed, the licensee shall submit to the NRC the reasons that led to their determination for each potentially affected valve. In the licensee submittal, the potentially affected sections of the TS, in addition to the valves, should be identified.

2.2 General Relief Requests

2.2.1 Relief Request: The following Category A valves will meet Appendix J leak testing requirements in lieu of Section XI requirements:

Main Steam System

1-14	1-38
1-15	1-51
1-26	1-52
1-27	1-55
1-37	1-56

999 022

Feedwater System

3-554	3-568
3-558	3-572

Standby Liquid Control

63-525
63-526

Reactor Water Cleanup

69-1
69-2
69-579

Reactor Core Isolation Coolant System

71-2	71-14
71-3	71-32
71-39	71-580
71-40	71-592

High Pressure Coolant Injection System

73-2	73-23
73-3	73-24
73-44	73-603
73-45	73-609

Reactor Heat Removal

74-57	74-71
74-58	74-72
74-60	74-74
74-61	74-75

Core Spray System

75-57
75-58

Code Requirement: IWV-3420 Valve Leak Rate Test. Category A valves shall be leak-tested. Tests shall be conducted at the same (or greater) frequency as scheduled refueling outages, but not less than once every two years. Valve seat leakage tests shall be made with the pressure differential in the same direction as will applied when the valve is performing its function with the following exceptions:

1. Any globe type valve my be tested with pressure underseat.

2. Butterfly valves may be tested in either direction, provided their seat construction is designed for sealing against pressure on either side.

3. Gate valves with two-piece disks may be tested by pressurizing them between the seats.

4. All valves (except check valves) may be tested in either direction if the function differential pressure is 15 psi or less.

5. The use of leakage tests involving pressure differentials lower than function pressure differentials are permitted in those types of valves in which service pressure will tend to diminish the overall leakage channel opening, as by pressing the disk into or onto the seat with greater force. Gate valves, check valves, and globe type valves having function pressure differential applied over the seat, are examples of valve applications satisfying this requirement. When leakage tests are made in such cases using pressures lower than function maximum pressure differential, the observed leakage shall be adjusted to function maximum pressure differential value by calculation appropriate to the test media and the ratio between test and function pressure differential assuming leakage to be directly proportional to the pressure differential to the one-half power.

6. Any valves not qualifying for reduced pressure testing as efined in 3420(c)(5) shall be leak-tested at full maximum function pressure differential, with adjustment by calculation if needed to compensate for a difference between service and test media.

Valve seat leakage may be determined by:

1. Draining the line, closing the valve, bringing one side to test pressure, and measuring leakage through a downstream telltale connection, or,

2. By measuring feed rate required to maintain pressure between two valves, or between two seats of a gate valve, provided the total apparent leak rate is charged to the valve or gate valve seat being tested, and that the conditions required by IWV-3420(c) are satisfied.

The test medium shall be specified by the Owner.

Licensee Basis for Relief Request: Appendix J leak testing meets the intent of Section XI requirements.

Evaluation: The Category A valve leak rate test requirements of IWV-3420 (a-e) have been superceded by Appendix J requirements for CIVs. The NRC staff has concluded that the applicable leak test procedures and requirements for CIVs are determined by 10 CFR 50 Appendix J. Relief from paragraph IWV-3420 (a-e) for CIVs presents no safety problem since the intent of IWV-3420 (a-e) is met by the Appendix J requirements.

Sections f and g of IWV-3420 must be met by the licensee otherwise relief must be requested from these paragraphs. It should be noted that this relief request applies only where a type C Appendix J leak test is performed. Therefore, it is recommended that relief be granted from the leak test requirements of Section XI for the preceding valves.

2.2.2 Relief Request: For all components, the inspector will be an employee of TVA and will not be qualified in accordance with IWA-2130.

Code Requirement: IWA-2130(b) - Any inspector who performs inspections required by this Division shall have first been qualified by written examination pursuant to the legislation or rules of a State of the United States, the legislation of a Canadian Province, or the rules of another authority having jurisdiction over a nuclear power plant at the installation location and that has adopted this Division. The Inspector shall not be an employee of the Owner or his agent.

Licensee Basis for Requesting Relief: The inservice tests are technical specification requirements and as such will receive a close and thorough review. Personnel from the central office in Chattanooga have been assigned responsibility to review the Section XI inservice testing programs at all TVA nuclear plants. An inspector will be designated from the central office and will perform the duties of the inspector in accordance with IWA-2120. This will provide an independent review of the program.

Evaluation: This is in direct conflict with the ASME B&PV Code and does not meet the intent of the Code. This request should be denied. Therefore, we recommend that the licensee meet the requirements of the Code.

2.2.3 Relief Request: For all valves, an inoperable valve will not necessarily preclude unit startup in accordance with IWV-3410 (g) and IWV-3520 (c).

Code Requirement: IWV-3410 (g) - Corrective Action. If a valve fails to exhibit the required change of valve stem or disk position by this testing, corrective action shall be initiated immediately. If the condition is not, or cannot be corrected within 24 hours, the valve shall be declared inoperative. When corrective action is required as a result of tests made during cold shutdown, the condition shall be corrected before startup. A retest showing acceptable operation shall be run following any required corrective action before the valve is returned to service.

IWV-3520 (c) - Corrective Action. If a check valve fails to exhibit the required change of disk position by this testing, corrective action shall be initiated immediately. If the condition is not, or cannot be corrected within 24 hours, the check valve shall be declared inoperative. When corrective action is required as a result

of tests made during cold shutdown, the condition shall be corrected before startup. A retest showing acceptable performance shall be run following any required corrective action before the valve is returned to service.

Licensee Basis for Relief Request: Whether a unit startup can be performed with an inoperable valve depends on many factors. Limiting conditions for startup have been analyzed in Browns Ferry Unit 3 Technical Specifications, Technical Bases 3.4B, 4.4, 3.5A, 3.5B, 3.5C, 3.5E, 3.5F. Valve inoperability will preclude unit startup only if the valve places the system itself in a position of preventing startup per present Technical Specifications.

Evaluation: The licensee has referenced applicable Technical Specifications paragraphs that are the basis for the relief request. This is in accordance with the latest NRC guidance on the subject. Therefore, it is recommended that relief be granted as requested.

2.3 Main Steam System (47W801-2)

2.3.1 Code Relief: Category B Valves

2.3.1.1 Relief Request: Valves 1-4, 1-5, 1-18, 1-19, 1-22, 1-23, 1-30, 1-31, 1-34, 1-41, and 1-42 will not be exercised in accordance with IWV-3410. In lieu of this, once each operating cycle, each main steam relief valve will be manually stroked until thermocouples downstream of the valve indicate steam is flowing from the valve.

Code Requirement: Category B valves shall be exercised at least once every 3 months with the exceptions as shown in the following paragraph.

Valves shall be exercised to the position required to fulfill their function unless such operation is not practical during plant operation. If only limited operation is practical during plant operation the valve shall be part stroke exercised during plant operation and full stroked during each cold shut; in case of frequent cold shutdowns these valves need not be exercised more often than once every 3 months. Normally closed valves that cannot be operated during normal plant operation shall be specifically identified by the Owner and shall be full stroke exercised during each cold shutdown; in case of frequent cold shutdowns these valves need not be exercised more often than once every 3 months.

Licensee Basis for Relief Request: These main steam relief valves cannot be operated during shutdown because diferential pressure across the valves is required to open them.

Evaluation: Valves 1-4, 1-5, 1-18, 1-19, 1-22, 1-23, 1-30, 1-34, 1-41, and 1-42 are main steam relief valves. They are power operated relief valves and thus put into category BC instead of Category C only. They cannot be partially stroked or fully stroked quarterly

due to the fact the plant would be adversely effected by the loss of steam associated with stroking these valves. These valves require differential steam pressure in addition to an initiate signal to cause movement. Adequate steam pressure is not available during cold shutdowns to stroke these valves. Based on the fact that exercising these valves quarterly adversely effects plant operations that there is no steam available at cold shutdowns, it is impractical, due to plant design, to full stroke exercise these valves quarterly. Therefore, relief is recommended to allow full stroke exercising of these valves at refueling outages in lieu of Section XI requirements for stroking, IWV-3510 requirements will have to be met. These valves have been recategorized.

2.4 Standby Liquid Control: (47W854-1 R5)

2.4.1 Code Relief: Category A valves.

2.4.1.1 Relief Request: For valve 63-525, the exercising frequency will be refueling outage in lieu of Section XI requirements.

Code Requirement: Category A valves shall be exercised at least once every 3 months with the exceptions as shown in the following paragraph. They shall be leak-tested at the same (or greater) frequency as scheduled refueling outages but not less than once every two years.

Valves shall be exercised to the position required to fulfill their function unless such operation is not practical during plant operation. If only limited operation is practical during plant operation the valve shall be part stroke exercised during plant operation and full stroked during each cold shut; in case of frequent cold shutdowns these valves need not be exercised more often than once every 3 months. Normally closed valves that cannot be operated during normal plant operation shall be specifically identified by the Owner and shall be full stroke exercised during each cold shutdown; in case of frequent cold shutdowns these valves need not be exercised more often than once every 3 months.

Licensee Basis for Relief Request: This check valve's operation cannot be practically verified during plant operation. In addition, cycling this valve requires actuation of the explosively operated valve.

Evaluation: Check valve 63-525 of the Standby Liquid Control System cannot be partially or fully stroked during normal plant operations or at cold shutdown. This is due to the fact the valve requires a reversal of flow which requires an explosive valve to be activated. There are no test connections available for verifying either a partial or full stroking of the valve. This valve has been categorized as Category AC. Due to the impracticality of stroking this valve quarterly or at cold shutdowns, relief is recommended to allow full stroking of the valve at refueling outages in lieu of Section XI requirements.

999 027

2.5 Nuclear Boiler System: (47W817-1 R13)

2.5.1 Code Relief: Category A valves

2.5.1.1 Relief Request: There will be no testing of valves 68-523, 68-550, 68-555, and 68-508.

Code Requirement: See Code Requirement Item 2.4.1.1.

Licensee Basis for Relief Request: These valves cannot be tested without interrupting seal water to the Recirculation Pumps, which is very likely to cause seal damage, which is a more serious failure than the valve failure.

Alternate Testing - Valves will be tested in accordance with 10 CFR 50, Appendix J, at each refueling outage, after suitable connections for such testing have been added to the piping.

Evaluation: Valves 68-523, 68-550, 68-555, and 68-500 are check valves of the nuclear boiler system. To demonstrate fulfillment of function these check valves require reversal of flow. A cessation of flow caused by stroking these valves affects the seal water to the Reactor Coolant Recirculation pumps. A change in seal water flow could damage these pumps, therefore partial stroking or full stroking at quarterly intervals is not practical. In addition, if seal water is stopped there exists the potential of reactor grade water leaking into the seal. Should reactor quality water with contamination of particulate matter enter the seals, the seals can be damaged when the pump is returned to operation. Therefore stroking these valves at cold shtudowns is not practical. Presently there are no test connections or instrumentation available to perform a test, at any time, to demonstrate that these valves move to the position to fulfill there safety function. However, the licensee states a proposed modification is presently being reviewed and awaits approval for installation. This modification would allow testing of the subject valves at refueling outages. It is acknowledged that the pumps must be shutdown periodically and then the danger exists to damage the pump seals. The intent of this relief request is to minimize such periodic pump shut downs. However, the requirement to exercise these valves is also important. Therefore, based on the impracticality of exercising these valves, and the licensee's plan to install modification to allow exercising, relief is recommended for this test period only, the next program should require exercising of these valves.

2.6 Reactor Water Cleanup System: (47W810-1 R13)

2.6.1 Code Relief: Category A Valves

2.6.1.1 Relief Request: The testing frequency for valves 69-1 and 69-2 will be at cold shutdowns if not tested within the last three months.

999 028

Code Requirement: See Code Requirement Item 2.4.1.1.

Licensee Basis for Relief Request: The valves cannot be tested unless the pump is off because of the interlocks. With the pump off, the seals are more susceptible to failure which subsequently results in bearing and pump failure. The failure of the pump presents a more serious problem than the possible failure of the valve.

Evaluation: Valves 69-1 and 69-2 of the Reactor Water Clean-up System are open or closed only valves, therefore a partial stroking of the valves is not practical. In addition, these valves cannot be tested unless the Clean-up Recirculation Pumps are off because of interlocks in the system. With the Clean-up Recirculation pumps off, their seals are more susceptible to failure which subsequently results in bearing and pump failure, the licensee states. The licensee has not submitted sufficient documentation to support the determination that these pumps will experience damage if these valves are exercised quarterly or at cold shutdowns. Therefore until such time as sufficient documentation to grant relief is presented, reviewed and acted upon the licensee should meet the requirements of the Code for valves 69-1 and 69-2.

2.6.1.2 Relief Request: The testing frequency for valve 69-579 will be at each refueling outage instead of each cold shutdown in accordance with IWV-3520.

Code Requirement: See Code Requirement Item 2.4.1.1.

Licensee Basis for Relief Request: This valve is a check valve whose operation cannot be practically verified during plant operation. Cycling valve 69-579 would require entering the drywell and installing test equipment.

Evaluation: Check valve 69-579 requires a cessation of flow to demonstrate it has moved to the position to fulfill its safety function. This valve cannot be tested unless the Clean-up Recirculation pumps are off because of interlocks in the system. With the Clean-up Recirculation pumps off, their seals are more susceptible to failure which subsequently results in bearing and pump failure, the licensee states. The licensee has not submitted sufficient documentation to support the determination that these pumps will experience damage if these valves are exercised quarterly or at cold shutdowns. Therefore, until such time as sufficient documentation to grant relief is presented, reviewed and acted upon the licensee should meet the requirements of the Code for valve 69-579.

2.7 Reactor Core Isolation Cooling System: (47W813-1 R11)

2.7.1 Code Relief: Category C valves.

2.7.1.1 Relief Request: Valve 71-508 will not be tested.

999 029

Code Requirement: Check valves shall be exercised at least once every 3 months, with the exceptions as shown in the following paragraph.

Check valves shall be exercised to the position required to fulfill their function unless such operation is not practical during plant operation. If only limited operation is practical during plant operation the check valve shall be part stroke exercised during plant operation and full stroked during each cold shutdown. In case of frequent cold shutdowns these check valves need not be exercised more often than once every 3 months. Normally closed check valves that cannot be operated during normal plant operation shall be specifically identified by the Owner and shall be full stroke exercised during each cold shutdown. In case of frequent cold shutdowns these check valves need not be exercised more often than once every 3 months.

Licensee Basis for Relief Request: Valve 71-508 cannot be cycled without introducing torus water into the vessel during RCIC actuations. This water is of such quality that it should not be introduced into the vessel unless an accident has occurred.

Evaluation: Check valve 71-508 of the RCIC System requires a flow of water thru the valve to demonstrate movement to fulfill its safety related function. The licensee states the water in the torus is not of acceptable quality to be introduced into the reactor except during an accident condition. To exercise this valve requires running the system pump in the torus to reactor vessel mode which the licensee finds unacceptable. The review of the licensee's submittal has indicated that the licensee has not submitted sufficient documentation to justify full relief from Code requirements. Until such time as sufficient documentation to grant relief is presented, reviewed, and acted upon the licensee should meet the requirements of the Code.

2.7.1.2 Relief Request: Valves 71-597, 71-598, 71-599, and 71-600 will not be tested individually to the Code..

Code Requirement: See Code Requirement Item 2.7.1.1.

Licensee Basis for Relief Request: There are no practical means available to verify full cycling of these valves in accordance with IWV-3410 and IWV-3520.

Evaluation: Valves 71-597, 71-598, 71-599, and 71-600 of the RCIC System will be treated as a single valve. This is because they are piped in parallel with cross connecting piping. In addition, there are no test connections available to verify their function independently. As a unit they will be tested to the requirements of Section XI. Therefore, based upon the impracticality due to plant design, it is recommended relief be granted to test these four valves as a unit in lieu of the Code's required independent testing.

2.8 High Pressure Coolant Injection System: (47W813-1 R11)

2.8.1 Code Relief: Category C Valves

2.8.1.1 Relief Request: Valve 73-517 will not be tested.

Code Requirement: See Code Requirement Item 2.7.1.1.

Licensee Basis for Relief Request: Valve 73-517 cannot be cycled without introducing torus water into the vessel during HPCI actuations. This water is of such quality that it should not be introduced into the vessel unless an accident has occurred.

Evaluation: Check valve 73-517 of the HPCI System requires a flow of water thru the valve to demonstrate movement to fulfill its safety related function. The licensee states the water in the torus is not of acceptable quality to be introduced into the reactor except during an accident condition. To exercise this valve requires running the system pump in the torus to reactor vessel mode which the licensee finds unacceptable. The review of the licensee's submittal has indicated that the licensee has not submitted sufficient documentation to justify full relief from Code requirements. Until such time as sufficient documentation to grant relief is presented, reviewed, and acted upon the licensee should meet the requirements of the Code.

2.8.1.2 Relief Request: Valves 73-633, 73-634, 73-635, and 73-636 will not be tested individually to the Code.

Code Requirement: See Code Requirement Item 2.7.1.1.

Licensee Basis for Relief Request: There are no practical means available to verify independent full cycling of these valves in accordance with IWV-3410 and IWV-3520. In addition, these valves are redundant and do not require full opening to perform their function.

Evaluation: Valves 73-633, 73-634, 73-635, and 73-636 of the HPCI System will be treated as a single valve in the system. These valves are credited in the system as a single valve because they are piped in parallel with cross connecting piping. In addition, there are no test connections available to verify their function independently. As a unit they will be tested to the requirements of Section XI. Therefore, based upon the impracticality due to plant design, it is recommended relief be granted to test these four valves as a unit in lieu of the Code's required independent testing.

2.9 Residual Heat Removal System: (47W811-1 R16)

2.9.1 Code Relief: Category A valves.

2.9.1.1 Relief Request: The exercising frequency for valves 74-661, and 74-662 will be each refueling outage instead of Section XI requirements.

Code Requirement: See Code Requirement Item 2.4.1.1.

Licensee Basis for Relief Request: These are check valves whose operation cannot be practically verified during plant operation. Cycling valves 74-661 and 74-662 would require entering the drywell and installing test equipment.

Evaluation: Valves 74-661 and 74-662 of the RHR System must be treated as a single valve due to the fact there are no test connections available to verify their function independently. In the system they are credited as a single valve for containment isolation and pressure isolation considerations. As a unit they will be classified as Category AC in the IST program. These check valves require flow to verify movement to fulfill function, and during normal plant operations the approximately 1000 psi system pressure cannot be overcome for either a partial stroke or full stroke of the valve. At cold shutdowns this system is required to operate, to stroke the valve requires the shutdown of the system, therefore stroking at cold shutdowns is impractical. Relief is recommended, based on the impracticality due to plant design, of stroking these valves at refueling outages in lieu of Section XI requirements.

2.9.2 Code Relief: Category B valves.

2.9.2.1 Relief Request: Valves 74-102, 74-103, 74-119, and 74-120 will not be exercised as required by Section XI of the ASME B&PV Code.

Code Requirement: See Code Requirement Item 2.3.1.1.

Licensee Basis for Relief Request: These valves are not required to be exercised due to the fact that they are always in their safety related position. The position of these valves during normal plant operation is the same as the position of the valve when performing its safety related function.

Evaluation: Valves 74-102, 74-103, 74-119, and 74-120 of the RHR System are passive valves. Therefore, it is recommended per item 2.1.8 that relief be granted from the stroking requirements of the Code.

3.0 COLD SHUTDOWN TESTING OF VALVES

3.1 General:

3.1.1 Valves shall be exercised to the position required to fulfill their function unless such operation is not practical during plant operation. If only limited operation is practical during plant operation, the valve shall be part-stroke exercised during plant operation and full-stroke exercised during cold shutdowns. Valves that cannot be exercised during plant operation shall be full-stroke exercised during cold shutdowns. Full-stroke exercising during cold shutdowns for valves not full-stroke exercised during plant operation shall be on a frequency determined by the intervals between shutdowns as follows: for intervals of 3 months or longer, exercise during each shutdown; for intervals of less than 3 months, full-stroke exercise is not required unless 3 months have passed since last shutdown exercise.

The intent of this section is to satisfy the requirements of the NRC letter dated January 13, 1978, i.e., "NRC Staff Guidance For Preparing Pump and Valve Testing Program Descriptions and Associated Relief Requests Pursuant to 10 CFR 50.55 a(g)," specifically section 5, page 7.

3.2 Feedwater System (47W803-1 R13)

3.2.1 Category A valves

3.2.1.1 Valves: 3-554, 3-558, 3-568, and 3-572.

Code Requirement: See Code Requirement Item 2.4.1.1.

Licensee Basis: These valves are check valves whose operation cannot be practically verified during plant operation. Cycling these valves requires entering the drywell and installing test equipment.

Evaluation: Valves 3-554, 3-558, 3-568, 3-572 of the Reactor Feedwater System are check valves which require the cessation of feedwater flow to demonstrate fulfillment of their function. During normal plant operation cessation of feedwater flow, for either part stroking or full stroking of these valves, will trip the reactor. The licensee has indicated that the exercising of these valves will require a large effort on the licensee's part. Based on the fact that exercising these valves during normal plant operations trips the reactor. Therefore, it is recommended, per NRC guidelines, to allow full stroke exercising of these valves at cold shutdowns.

999 033

3.3 Standby Liquid Control (47W854-1 R5)

3.3.1 Category AC valves

3.3.1.1 Valve: 63-526

Code Requirement: See Code Requirement Item 2.4.1.1.

Licensee Basis: This check valve's operation cannot be practically verified during plant operation. In addition, cycling this valve requires actuation of the explosively operated valve.

Evaluation: Check valve 63-526 cannot be exercised partially or fully during normal plant operations because reactor pressure cannot be overcome. It is recommended, per NRC guidelines, that because of the impracticality of stroking valve 63-526 during normal plant operation, to allow exercising the valve to the position to fulfill its function at cold shutdowns.

3.4 Nuclear Boiler System (47W817-1 R13)

3.4.1 Category B Valves

3.4.1.1 Valves: 68-1, 68-3, 68-77, 68-79.

Code Requirement: See Code Requirement Item 2.3.1.1.

Licensee Basis: The stroking of these valves is not practical during normal operation.

Evaluation: Valves 68-1, 68-3, 68-77, and 68-79 are open or closed only valves in the Nuclear Boiler System and therefore cannot be partially stroked. Full stroking these valves causes the loss of flow to the recirculation pumps causing adverse plant operations such as changes in reactivity, power transients, and a possible reactor trip, during normal plant operations. Since exercising these valves adversely affects normal plant operations, causing the potential for a reactor trip, it is recommended, per NRC guidelines, to allow full stroke exercising of these valves at cold shutdowns.

3.5 Reactor Core Isolation Cooling System (47W813-1 R11)

3.5.1 Category A Valves

3.5.1.1 Valves: 71-2 and 71-3.

Code Requirement: See Code Requirement Item 2.4.1.1.

Licensee Basis: The stroking of these valves is not practical during normal operation.

Evaluation: Valves 71-2 and 71-3 of the RCIC System are open or closed only valves, therefore a partial-stroking of the valves is not practical. Should either of these valves fail closed during exercising, this system becomes inoperative. Based on the fact that failure of any one of the valves during exercising places the plant in an unsafe condition, it is recommended, per NRC guidelines, to allow full stroke exercising of these valves at cold shutdowns.

3.5.1.2 Valve: 71-40

Code Requirement: See Code Requirement Item 2.4.1.1.

Licensee Basis: The stroking of this valve is not practical during normal plant operation.

Evaluation: Valve 71-40 of the RCIC System cannot be fully or partially stroked during operation because there is no practical means available to provide positive assurance that valve 73-45 will prevent the over pressurization of the RCIC System. Since there exists the potential to place the RCIC System out of service by testing valve 71-40 during normal operation, it is recommended, per NRC guidelines, to allow full stroke exercising of this valve at cold shutdowns.

3.5.1.3 Valve: 71-39

Code Requirement: See Code Requirement Item 2.4.1.1.

Licensee Basis: The stroking of this valve is not practical during normal plant operation.

Evaluation: Valve 71-39 cannot be partially or fully stroked during normal operation because there is no practical means available to provide positive assurance that check valve 71-40 is leak tight, and the possibility exists to over pressurize the RCIC System. Since there exists the potential to place the RCIC System out of service by testing valve 71-39 during normal operation, it is recommended, per NRC guidelines, to allow full stroke exercising of this valve at cold shutdowns.

3.5.2 Category B Valves

3.5.2.1 Valve: 71-37

Code Requirement: See Code Requirement Item 2.3.1.1.

Licensee Basis: The stroking of this valve is not practical during normal plant operation.

Evaluation: Valve 71-37 of the RCIC System is an open or closed only valve, therefore a partial stroking of this valve is not practical.

Should it fail closed during exercising, this system becomes inoperative. Based on the fact that failure of this valve during exercising places the plant in an unsafe condition, it is recommended, per NRC guidelines, to allow full stroke exercising of valve 71-37 at cold shutdowns.

3.6 High Pressure Coolant Injection System (47W812-1 R15)

3.6.1 Category A Valves

3.6.1.1 Valves: 73-44, and 73-45

Code Requirement: See Code Requirement Item 2.4.1.1.

Licensee Basis: The stroking of these valves is not practical during normal plant operation.

Evaluation: Valves 73-44 and 73-45 are category AC check valves in series. Valve 73-44 cannot be partially or fully stroked during normal operation because there is no practical means available to provide positive assurance that check valve 73-45 is leak tight and the possibility exists to overpressurize the HPCI system. In the same way, valve 73-45 cannot be partially or fully stroked during normal operation because there is no practical means available to provide positive assurance that check valve 73-44 is leak tight and the possibility exists to overpressurize the HPCI System. Since there exists the potential to place the HPCI out of service by testing either valve, it is recommended, per NRC guidelines, to allow full stroke exercising of these valves at cold shutdowns.

3.6.1.2 Valve: 73-2, 73-3.

Code Requirement: See Code Requirement Item 2.4.1.1.

Licensee Basis: The stroking of these valves is not practical during normal plant operation.

Evaluation: Valves 73-2 and 73-3 of the HPCI System are open or closed only valves, therefore a partial-stroking of these valves is not practical. Should either of these valves fail closed during exercising, this system becomes inoperative. Based on the fact that failure of any one of the valves during exercising places the plant in an unsafe condition, it is recommended, per NRC guidelines, to allow full stroke exercising of these valves at cold shutdowns.

3.6.2 Category B Valves

3.6.2.1 Valve: 73-34

Code Requirement: See Code Requirement Item 2.3.1.1.

Licer. e Basis: The stroking of this valve is not practical during normal plant operation.

Evaluation: Valve 73-34 of the HPCI System is an open or closed only valve, therefore, a partial stroking of this valve is not practical. Should it fail closed during exercising, the HPCI system becomes inoperative. Based on the fact that failure of this valve during exercising places the plant in an unsafe condition, it is recommended, per NRC guidelines, to allow full stroke exercising of valve 73-34 at cold shutdowns.

3.7 Residual Heat Removal System (47W811-1 R16)

3.7.1 Category A Valves

3.7.1.1 Valves: 74-47 and 74-48.

Code Requirement: See Code Requirement Item 2.4.1.1.

Licensee Basis: The stroking of these valves is not practical during normal plant operation.

Evaluation: Valves 74-47 and 74-48 of the RHR System cannot be partial or fully stroked during normal operations due to the fact they are pressure interlocked and will not open at system pressures of approximately 1000 psi. Since it is not practical to test these valves during normal operation, it is recommended, per NRC guidelines, to allow full stroke exercising of these valves at cold shutdowns.

3.7.1.2 Valves: 74-53 and 74-54

Code Requirement: See Code Requirement Item 2.4.1.1.

Licensee Basis: The stroking of these valves is not practical during normal plant operation.

Evaluation: Valves 74-53 and 74-54 are category AC check valves in series. Valve 74-53 cannot be partially or fully stroked during normal operation because there is no practical means available to provide positive assurance that check valve 74-54 is leak tight and the possibility exists to overpressurize the RHR system. In the same way, valve 74-54 cannot be partially or fully stroked during normal operation. Because there is no practical means available to provide positive assurance that check valve 74-53 is leak tight and the possibility exists to overpressurize the RHR system. Since there exists the potential to place the RHR System out of service by testing either valve 74-53 or 74-54 during normal operation, it is recommended, per NRC guidelines, to allow full stroke exercising of these valves at cold shutdowns.

3.7.1.3 Valves: 74-67 and 74-68

Code Requirement: See Code Requirement Item 2.4.1.1.

Licensee Basis: The stroking of these valves is not practical during normal plant operation.

Evaluation: Valves 74-67 and 74-68 are a pair of category AC check valves in series. Valve 74-67 cannot be partially or fully stroked during normal operation because there is no practical means available to provide positive assurance that check valve 74-68 is leak tight and the possibility exists to overpressurize the RHR system. In the same way, valve 74-68 cannot be partially or fully stroked during normal operation because there is no practical means available to provide positive assurance that check valve 74-67 is leak tight and the possibility exists to overpressurize the RHR system. Since there exists the potential to place the RHR out of service by testing either valve 74-67 or 74-68 during normal operation, it is recommended, per NRC guidelines, to allow full stroke exercising of these valves at cold shutdowns.

3.7.1.4 Valves: 74-77 and 74-78

Code Requirement: See Code Requirement Item 2.4.1.1.

Licensee Basis: The stroking of these valves is not practical during normal plant operation.

Evaluation: Valves 74-77 and 74-78 are category A check valves in series. Valve 74-77 cannot be partially or fully stroked during normal operation because there is no practical means available to provide positive assurance that check valve 74-78 is leak tight and the possibility exists to overpressurize the RHR system. In the same way, valve 74-78 cannot be partially or fully stroked during normal operation because there is no practical means available to provide positive assurance that check valve 74-77 is leak tight and the possibility exists to overpressurize the RHR System. Since there exists the potential to place the RHR out of service by testing either valve 74-77 or 74-78 during normal operation, it is recommended, per NRC guidelines, to allow full stroke exercising of these valves at cold shutdowns.

3.8 Core Spray System (47W814-1 R15)

3.8.1 Category A Valves

3.8.1.1 Valves: 75-25 and 75-26.

Code Requirement: See Code Requirement Item 2.4.1.1.

Licensee Basis: The stroking of these valves is not practical during normal plant operation.

Evaluation: Valves 75-25 and 75-26 are category AC check valves in series. Valve 75-25 cannot be partially or fully stroked during normal operation because there is no practical means available to provide positive assurance that check valve 75-26 is leak tight and the possibility exists to overpressurize the core spray system. In the same way, valve 75-26 cannot be partially or fully stroked during normal operation because there is no practical means available to provide positive assurance that check valve 75-25 is leak tight and the possibility exists to overpressurize the core spray system. Since there exists the potential to place the core spray out of service by testing either valve 75-25 or 75-26 during normal operation, it is recommended, per NRC guidelines, to allow full stroke exercising of these valves at cold shutdowns.

3.8.1.2 Valves: 75-53 and 75-54.

Code Requirement: See Code Requirement Item 2.4.1.1.

Licensee Basis: The stroking of these valves is not practical during normal plant operation.

Evaluation: Valves 75-53 and 75-54 are category AC check valves in series. Valve 75-53 cannot be partially or fully stroked during normal operation because there is no practical means available to provide positive assurance that check valve 75-54 is leak tight and the possibility exists to overpressurize the core spray system. In the same way, valve 75-54 cannot be partially or fully stroked during normal operation because there is no practical means available to provide positive assurance that check valve 75-53 is leak tight and the possibility exists to overpressurize the core spray system. Since there exists the potential to place the core spray out of service by testing either valve 75-53 or 75-54 during normal operation, it is recommended, per NRC guidelines, to allow full stroke exercising of these valves at cold shutdowns.

3.9 Control Rod Drive System (47W820-1 R9, 47W820-2 R8)

3.9.1 Category B Valves

3.9.1.1 Valves: 85-39A-1 thru 85-39A-185, 85-39B-1 thru 85-39B-185.

Code Requirement: See Code Requirement Item 2.3.1.1.

Licensee Basis: Cycling these valves requires scramming a control rod. There are 185 control rods in the reactor. Scramming every rod once every three months is not practical for the following reasons.

a. A power reduction is required to test the scram function. Reducing power for the length of time required to scram 185 rods places an unfair burden on the licensee.

b. Fuel preconditioning must follow this power reduction to avoid possible fuel damage. The longer the reduction in power, the longer the preconditioning.

Alternate Testing - 10% of the rods will be scram tested every sixteen weeks, and all rods will be scram tested during refueling, per present Technical Specifications. In addition, all rods are provided with the same test during normal operation when the unit scrams.

Evaluation: Valves 85-39A-1 thru 85-39A-185 and 85-39B-1 thru 85-39B-185 of the Control Rod Drive System are open or closed valves only, therefore partial stroking is not practical. These valves are the Scram inlet and outlet valves and to full stroke them requires a load reduction because of the changes in neutron flux caused by their exercising. Presently, technical specifications require ten percent of all control rods to be scram tested at sixteen-week intervals and all rods to be scram tested once per operating cycle (currently annually). The licensee states these valves are full stroked at every plant outage. Based on the fact that quarterly stroking of these valves adversely affects plant operation, it is recommended, per NRC guidelines, to allow full stroke exercising of these valves at cold shutdowns.

4.0 PROGRAM BREAKDOWN

4.1 Main Steam System (47W801-1 R10; 47W801-2 R9)

4.1.1 The following are valves in the IST program which the licensee intends to test to the applicable code requirement.

Valve	Category	Valve	Category
1-14	A	1-51	A
1-15	A	1-52	A
1-26	A	%1-55	A
1-27	A	%1-56	A
1-37	A	$1-501	C
1-38	A	$1-537	C

4.1.2 The following are valves that were listed in the IST submittal and were deleted from the IST program as being non-safety related (safety related as defined by "NRC Staff Guidance for Preparing Pump/Valve Testing...," dated January 13, 1978).

Valve	Valve
1-57	1-172
1-133	1-173
1-155	1-125
1-156	1-141

4.1.3 The following are valves in the IST submittal that will be recategorized in the resubmittal as a result of the SER meeting(1).

Valve	From Category	To Category
1-4	B	BC
1-5	B	BC
1-18	B	BC
1-19	B	BC
1-22	B	BC

$ General Relief Request 2.1.2

% 1-55 and 1-56. These valves were deleted from the IST Program, as resubmitted, by TVA letter dated 6/4/79, page 1 of Attachment 2. The Technical Specifications show these valves as being Containment Isolation Valves.

(1) All of these valves shown as Category BC are in the IST Program resubmittal as Category C. These are power operated relief valves which require Category B stroking.

Valve	From Category	To Category
1-23	B	BC
1-30	B	BC
1-31	B	BC
1-34	B	BC
1-41	B	BC
1-42	B	BC

4.1.4 The following are valves in the IST submittal that cannot meet the requirements of Section XI and relief has been requested.

Valve	Category	Valve	Category
*1-4	B	*1-23	B
*1-5	B	*1-30	B
*1-18	B	*1-34	B
*1-19	B	*1-41	B
*1-22	B	*1-42	B
+1-14	A	+1-38	A
+1-15	A	+1-51	A
+1-26	A	+1-52	A
+1-27	A	+1-55	A
+1-37	A	+1-56	A

4.2 Feedwater System (47W803-1 R13)

4.2.1 The following are valves in the IST program which the licensee intends to test to the applicable code requirement.

Valve	Category
3-66	E
3-67	E

4.2.2 The following are valves in the IST submittal that will be recategorized in the resubmittal as a result of the SER meeting.

Valve	From Category	To Category
*3-554	C	C
*3-558	C	C
*3-568	C	C
*3-572	C	C

4.2.3 The following are valves in the IST submittal that cannot be full stroke exercised every 3 months but will meet the requirements of Section XI. Additional information is required by the NRC to verify the impracticality of full stroke exercising every 3 months.

*Valves Recategorized
+General Relief Request 2.2.1

Valve	Category
*3-554	C
*3-558	C
*3-568	C
*3-572	C

4.3 Heater Drains and Vents (47W805-1 R9)

4.3.1 The following are valves that were listed in the IST submittal and were deleted from the IST program as being non-safety related (safety related as defined by "NRC Staff Guidance for Preparing Pump/Valve Testing...," dated January 13, 1978).

Valve
6-113
6-114
6-153
6-155
6-157

4.4 Residual Heat Removal Service Water (47W858-1 R10)

4.4.1 The following are valves in the IST program which the licensee intends to test to the applicable code requirement.

Valve	Category	Valve	Category
23-502	C	23-581	C
23-506	C	23-582	C
23-522	C	23-591	C
23-526	C	23-594	C
23-542	C	23-597	C
23-546	C	23-34	B
23-561	C	23-40	B
23-565	C	23-46	B
23-579	C	23-52	B
23-580	C	23-588	C

4.4.2 The following are valves that were not listed in the IST submittal and were agreed upon to be considered safety related and therefore will be added to the resubmittal as shown.

Valve	Category
23-588	C

4.4.3 The following are valves that were listed in the IST submittal and were deleted from the IST program as being non-safety related (safety related as defined by "NRC Staff Guidance for Preparing Pump/Valve Testing...," dated January 13, 1978).

* Valves recategorized

Valve	Valve
23-509	$23-605
23-516	$23-607
23-529	23-549
23-536	23-555
$23-601	23-574
$23-603	23-568

4.5 Reactor Cooling Water (47W844-2 R13)

4.5.1 The following are valves in the IST program which the licensee intends to test to the applicable code requirement(1).

Valve	Category	Valve	Category
24-707	C	24-798	C
24-714A	C	24-826	C
24-714B	C	24-831	C
24-730	C	24-833	C
24-796	C		

4.6 Sampling and Water Quality (47W610-43-1 R24)

4.6.1 The following are valves in the IST program which the licensee intends to test to the applicable code requirement.

Valve	Category
%43-13	A
%43-14	A

4.7 Standby Liquid Control (47W854-1 R5)

4.7.1 The following are valves in the IST program which the licensee intends to test to the applicable code requirement.

Valve	Category	Valve	Category
63-514	C	63-507	E
63-516	C	63-515	E
$%63-512	C	63-517	E
$%63-513	C	63-524	E

$ 23-601, 23-603, 23-605, and 23-607 see Item 2.1.3.

$ 63-512 and 63-513. See Item 2.1.2.

% 43-13 and 43-14. These valves do not appear in the resubmitted IST Program.

% 63-512 and 63-513. Setpoints of these valves are tested once per operating cycle in place per present Technical specification 4.4.A.2. There is no additional safety margin gained by testing per Section XI. These valves are meeting a more conservative requirement than Section XI, therefore, "Request for Relief PV-30" is not required.

(1) Previously these valves tested every 9 months.

Valve	Category	Valve	Category
63-8A	D	63-527	E
63-8B	D	63-528	E
63-500	E	63-506	E

4.7.2 The following are valves that were not listed in the IST submittal and were agreed upon to be considered safety related and therefore will be added to the resubmittal as shown.

Valve	Category
*63-525	C
*63-526	C

4.7.3 The following are valves that were listed in the IST submittal and were deleted from the IST program as being non-safety related (safety related as defined by "NRC Staff Guidance for Preparing Pump/Valve Testing...," dated January 13, 1978)

Valve	Valve
63-502	63-518
63-505	63-522
63-509	63-540
63-511	

4.7.4 The following are valves in the IST submittal that will be re-categorized in the resubmittal as a result of the SER meeting.

Valve	From Category	To Category
63-526	C	AC
63-525	C	AC

4.7.5 The following are valves in the IST submittal that cannot meet the requirements of Section XI and relief has been requested.

Valve	Category
*63-525	C

4.7.6 The following are valves in the IST submittal that cannot be full stroke exercised every 3 months but will meet the requirements of Section XI. Additional information is required by the NRC to verify the impracticality of full stroke exercising every 3 months.

Valve	Category
*63-526	C

* Valves recategorized

4.8 Emergency Equipment - Cooling Water (47W859-1 R17)

4.8.1 The following are valves in the IST program which the licensee intends to test to the applicable code requirement.

4.8.1.1 The following valves will be tested to Code requirements.

Valve	Category	Valve	Category
67-13	B	67-582	C
67-14	B	67-622	C
67-17	B	67-743	E
67-18	B	67-744	E
67-21	B	67-511	E
67-22	B	67-518	E
67-25	B	67-525	E
67-26	B	67-532	E
67-48	B	67-551	E
67-49	B	67-561	E
67-56	B	67-565	E
67-556	C	67-572	E
67-598	C	67-594	E
67-785	C	67-603	E
67-502	C	67-606	E
		67-614	E

4.8.1.2 The following valves will meet the Code requirements. Previously, they were tested every 9 months.

Valve	Category	Valve	Category
67-541	C	67-693	C
67-542	C	67-694	C
67-558	C	67-695	C
67-559	C	67-696	C
67-577	C	%67-700	C
67-584	C	67-703	C
67-585	C	67-704	C
67-597	C	67-705	C
67-600	C	67-706	C
67-601	C	%67-710	C
67-619	C	67-713	C
67-638	C	67-714	C
67-639	C	67-715	C
67-642	C	67-716	C
67-648	C	%67-720	C
67-649	C	67-723	C

% These valves were added to the IST Program by letter dated January 24, 1978 to the NRC from the TVA - Attachment 1 titled Attachment 2 - Additions to Valve list. This letter changes the TVA letter sent to the NRC dated May 25, 1977.

Valve	Category	Valve	Category
67-656	C	67-724	C
67-657	C	67-725	C
67-659	C	67-726	C
67-660	C	67-730	C
67-671	C	67-735	C
67-679	C	67-736	C
67-737	C	67-738	C

4.8.2 The following are valves that were not listed in the IST submittal and were agreed upon to be considered safety related and therefore will be added to the resubmittal as shown.

Valve	Category
67-556	C
67-598	C
67-785	C
67-502	C
67-582	C
67-622	C

4.8.3 The following are valves that were listed in the IST submittal and were deleted from the IST program as being non-safety related (safety related as defined by "NRC Staff Guidance for Preparing Pump/Valve Testing...," dated January 13, 1978).

Valve	Valve
67-783	67-1
67-799	67-5
67-802	67-8
67-805	67-11
67-544	67-50
67-548	67-51
67-587	67-53
67-591	

4.9 Nuclear Boiler System (47W817-1 R13)

4.9.1 The following are valves that were not listed in the IST submittal and were agreed upon to be considered safety related and therefore will be added to the resubmittal as shown.

Valve	Category
*68-523	C
*68-550	C
*68-555	C

* Valves recategorized.

999 047

4.9.2 The following are valves in the IST submittal that will be recategorized in the resubmittal as a result of the SER meeting.

Valve	From Category	To Category
68-523	C	AC
68-550	C	AC
68-555	C	AC
68-508	C	AC

4.9.3 The following are valves in the IST sdubmittal that cannot meet the requirements of Section XI and relief has been requested.

Valve	Category
*68-523	C
*68-550	C
*68-555	C
*68-508	C

4.9.4 The following are valves in the IST submittal that cannot be full stroke exercised every 3 months but will meet the requirements of Section XI. Additional information is required by the NRC to verify the impracticality of full stroke exercising every 3 months.

Valve	Category	Valve	Category
%68-1	B	%68-77	B
68-3	B	68-79	B

4.10 Reactor Water Cleanup System (47W310-1 R13)

4.10.1 The following are valves that were listed in the IST submittal and were deleted from the IST program as being non-safety related (safety related as defined by "NRC Staff Guidance for Preparing Pump/Valve Testing...," dated January 13, 1978).

Valve
$69-12

4.10.2 The following are valves in the IST submittal that will be recategorized in the resubmittal as a result of the SER meeting.

Valve	From Category	To Category
69-579	C	AC

* Valve recategorized

$ See Item 2.1.2

% 68-1 and 68-77. These valves were deleted from the IST Program, as resubmitted, by TVA letter dated 6/4/79, page 7 of Attachment 2. No information was provided with the deletion of these valves.

4.10.3 The following are valves in the IST submittal that cannot meet the requirements of Section XI and relief has been requested.

Valve	Category
69-1	A
69-2	A
*69-579	C

4.11 Reactor Core Isolation Cooling System (47W813-1 R11)

4.11.1 The following are valves in the IST program which the licensee intends to test to the applicable code requirement for stroking.

Valve	Category	Valve	Category
71-5	B	71-9	B
71-17	A	71-22	B
71-18	B	71-571	E
71-6A	B	%71-14	C
71-6B	B	*71-59	B
71-16	E	%71-32	C
71-570	E	71-580	AC
71-578	E	71-592	AC
71-579	E	%71-543	C
71-8	B	71-10	B
71-25	B		

4.11.2 The following are valves that were not listed in the IST submittal and were agreed upon to be considered safety related and therefore will be added to the resubmittal as shown.

Valve	Category	Valve	Category
71-597	C	71-10	B
71-598	C	71-22	B
71-599	C	71-571	E
71-600	C	*71-32	C
71-9	B	71-508	C
71-592	AC	71-592	AC

4.11.3 The following are valves that were listed in the IST submittal and were deleted from the IST program as being non-safety related (safety related as defined by "NRC Staff Guidance for Preparing Pump/Valve Testing...," dated January 13, 1978).

---

* Valves recategorized

% 71-543. This valve is shown with a test frequency of 60 months in the resubmitted IST Program. This frequency requires a relief request to be granted which has not been done.

% 71-32 and 71-14. These valves do not have a relief request approved to deviate from Section XI requirements for stroking.

Valve	Valve
71-38	71-502
71-19	71-503
71-7B	71-542
%71-7A	

4.11.4 The following are valves in the IST submittal that will be recategorized in the resubmittal as a result of the SER meeting.

Valve	From Category	To Category
71-14	C	AE
71-32	C	AE
71-59	B	E
71-39	B	A

4.11.5 The following are valves in the IST submittal that cannot meet the requirements of Section XI and relief has been requested.

Valve	Category	Valve	Category
71-508	C	71-599	C
71-597	C	71-600	C
71-598	C	*+71-14	C
*+71-39	B	+71-2	A
+71-40	A	+71-3	A
*+71-32	C	+71-580	AC
+71-592	AC	+71-543	C

4.11.6 The following are valves in the IST submittal that cannot be full stroke exercised every 3 months but will meet the requirements of Section XI. Additional information is required by the NRC to verify the impracticality of full stroke exercising every 3 months.

Valve	Category	Valve	Category
71-2	A	*71-39	B
71-3	A	71-37	B
71-40	A		

+ General Relief Request 2.2.1
* Valves recategorized.
% 71-7A. This valve was shown as deleted in the November 22, 1978 resubmittal (Reference 2). This valve appears to be similar to valve 71-7B which was deleted at the August 15, 1978 SER meeting; therefore, it would appear that valve 71-7A is a non-safety related valve, and that the licensee has chosen the option of deleting this valve from the IST program as non-safety related.

4.12 High Pressure Coolant Injection System: (47W813-1 R11)

4.12.1 The following are valves in the IST program which the licensee intends to test to the applicable code requirement for stroking.

Valve	Category	Valve	Category
73-5	B	73-607	E
73-16	B	73-608	E
%73-26	A	73-25	E
73-27	B	%*73-24	C
73-593	E	%*73-64	B
73-6A	B	73-18	B
73-6B	B	73-19	B
73-43	B	73-23	C
73-609	AC	*73-603	AC
		$73-574	C

4.12.2 The following are valves that were not listed in the IST submittal and were agreed upon to be considered safety related and therefore will be added to the resubmittal as shown.

Valve	Category	Valve	Category
73-633	C	73-517	C
73-634	C	73-24	C
73-635	C	73-593	E
73-636	C	73-609	AC
73-18	B	73-44	AC
73-19	B	%73-30	B
73-43	B		

$ See Item 2.1.2

* Valve recategorized

% 73-26. For this valve the TVA's 11/28/78 letter, page 4, shows this valve as being a Category B valve.

% 73-24. This valve does not have a relief request approved to deviate from Section XI requirements for stroking.

% 73-23. This valve was shown as a Category C valve meeting Code requirements in the original IST program. In the resubmitted IST program it is shown as Category AE. This valve does not have a relief request approved to deviate from Section XI requirements for stroking. A review of Drawing #47W812-1 R15, indicates that this valve is normally locked open. Per page 279 of the Technical Specifications dated July 2, 1976, this valve appears as a CIV. This valve requires further review.

% 73-64. This valve does not appear in the resubmitted IST Program and see Item 2.1.4. The August 15 and 16, 1978 meeting notes show this valve being changed from Category B to Category E.

% 73-30. This valve does not appear in the resubmitted IST Program and see Item 2.1.4.

4.12 3 The following are valves that were listed in the IST submittal and were deleted from the IST program as being non-safety related (safety related as defined by "NRC Staff Guidance For Preparing Pump/Valve Testing...," dated January 13, 1978).

Valve	Valve
73-8	73-625
73-35	73-559
73-36	73-40
73-620	73-505
73-624	73-506

4.12.4 The following are valves in the IST submittal that will be re-categorized in the resubmittal as a result of the SER meeting.

Valve	From Category	To Category
73-64	B	E
73-24	C	AE
73-603	C	AC
73-45	C	AC

4.12.5 The following are valves in the IST submittal that cannot meet the requirements of Section XI and relief has been requested.

Valve	Category	Valve	Category
73-517	C	73-635	C
73-633	C	73-636	C
73-634	C	*+73-24	C
+73-609	AC	+73-2	A
+73-44	AC	+73-3	A
*+73-45	C	*+73-603	C
+73-23	E		

4.12.6 The following are valves in the IST submittal that cannot be full stroke exercised every 3 months but will meet the requirements of Section XI. Additional information is required by the NRC to verify the impracticality of full stroke exercising every 3 months.

Valve	Category	Valve	Category
%73-44	C	73-3	A
%*73-45	C	73-34	B
73-2	A		

4.13 Residual Heat Removal System: (47W811-1 R16)

---

* Valves recategorized
\+ General Relief Request 2.2.1
% 73-44 and 73-45. These valves are shown in the resubmittal as Category A valves.

4.13.1 The following are valves in the IST program which the licensee intends to test to the applicable code requirement.

Valve	Category	Valve	Category
74-1	B	74-560C	C
74-2	B	74-560D	C
74-7	B	74-75	A
74-12	B	74-96	B
74-13	B	74-97	B
74-24	B	74-100	B
74-25	B	74-559A	C
74-30	B	74-559B	C
74-35	B	74-559C	C
74-36	B	74-559D	C
74-46	B	74-10	E
74-52	P	74-22	E
74-57	A	74-33	E
74-58	A	74-44	E
%74-59	A	74-49	E
74-60	A	74-55	E
74-61	A	74-69	E
74-66	B	74-85	E
74-71	A	74-86	E
74-72	A	74-87	E
%74-73	B	74-88	E
74-74	B	74-89	E
74-98	B	74-90	E
74-560A	C	74-150	E
74-560B	C	74-99	B
		74-722	E

4.13.2 The following are valves that were not listed in the IST submittal and were agreed upon to be considered safety related and therefore will be added to the resubmittal as shown.

Valve	Category	Valve	Category
74-560A	C	%74-67	A
74-560B	C	74-98	B
74-560C	C	74-99	B
74-560D	C	74-76	B
%74-53	A		

% 74-59 and 74-73. These valves do not appear in the resubmitted IST Program.

% 74-53 and 74-67. These valves should be categorized as AC.

4.13.3 The following are valves that were listed in the IST submittal and were deleted from the IST program as being non-safety related (safety related as defined by "NRC Staff Guidance For Preparing Pump/Valve Testing...," dated January 13, 1978).

Valve	Valve
$74-76	74-570A
74-803	74-570B
74-804	74-570C
74-509A	74-570D
74-509B	74-573A
74-509C	74-573B
74-509D	74-622
74-578A	74-624
74-578B	74-765A
74-578C	74-765B
74-578D	74-575A
74-659	74-575B
74-686	74-575C
74-525A	74-575D
74-525B	$74-698
74-525C	$74-706
74-525D	$74-669
74-532A	$74-674
74-532B	$74-680A
74-532C	$74-680B
74-532D	$74-691

4.13.4 The following are valves in the IST submittal that will be re-categorized in the resubmittal as a result of the SER meeting.

Valve	From Category	To Category
74-661	C	AC
74-662	C	AC
74-68	C	AC
74-54	C	AC

4.13.5 The following are valves in the IST submittal that cannot meet the requirements of Section XI and relief has been requested.

Valve	Category	Valve	Category
74-661	AC	74-103	B
74-662	AC	74-119	B
74-102	B	74-120	B
+74-60	A	+74-71	A
+74-61	A	+74-72	A
+74-57	A	+74-58	A
+74-75	A	+74-74	A

+ General Relief Request 2.2.1
$ See Item 2.1.3.

4.13.6 The following are valves in the IST submittal that cannot be full stroke exercised every 3 months but will meet the requirements of Section XI. Additional information is required by the NRC to verify the impracticality of full stroke exercising every 3 months.

Valve	Category	Valve	Category
74-47	A	74-68	C
74-48	A	74-67	A
*74-53	A	74-77	A
*74-54	C	74-78	A

4.14 Core Spray System: (47W814-1 R15)

4.14.1 The following are valves in the IST program which the licensee intends to test to the applicable code requirements.

Valve	Category	Valve	Category
75-2	B	75-17	E
75-9	B	75-18	E
75-11	B	75-27	E
75-23	B	75-29	E
75-30	B	75-36	E
75-37	B	75-38	E
75-51	B	75-45	E
75-57	A	75-46	E
75-58	A	75-55	E
75-537A	C	75-10	E
75-537B	C	75-570A	C
75-537C	C	75-570B	C
75-538D	C	75-570C	C
$75-507A	C	75-570D	C
$75-507B	C	$75-507C	C
75-1	E	$75-507D	C
75-8			

4.14.2 The following are valves that were not listed in the IST submittal and were agreed upon to be considered safety related and therefore will be added to the resubmittal as shown.

Valve	Category	Valve	Category
75-570A	C	75-570C	C
75-570B	C	75-570D	C
75-25	AC	75-53	AC

* Valves recategorized
$ See Item 2.1.2

4.14.3 The following are valves that were listed in the IST submittal and were deleted from the IST program as being non-safety related (safety related as defined by "NRC Staff Guidance For Preparing Pump/Valve Testing...," dated January 13, 1978).

Valve	Valve
75-543A	75-512B
75-543B	75-512C
75-3	75-512D
75-12	75-574A
75-31	75-574B
75-22	75-574C
75-40	75-574D
75-512A	75-50

4.14.4 The following are valves in the IST submittal that will be re-categorized in the resubmittal as a result of the SER meeting.

Valve	From Category	To Category
75-26	C	AC
75-54	C	AC

4.14.5 The following are valves in the IST submittal that cannot meet the requirements of Section XI and relief has been requested.

Valve	Category	Valve	Category
+75-57	A	75-25	AC
+75-58	A	75-26	C

4.14.6 The following are valves in the IST submittal that cannot be full stroke exercised every 3 months but will meet the requirements of Section XI. Additional information is required by the NRC to verify the impracticality of full stroke exercising every 3 months.

Valve	Category	Valve	Category
%75-25	AC	%75-53	AC
*75-26	C	*75-54	AC

4.15 Floor and Equipment Drains

4.15.1 The following are valves in the IST program which the licensee intends to test to the applicable code requirement.

\+ General Relief Request 2.2.1
* Valves recategorized
% 75-25 and 75-53. These valves are shown in the resubmittal as Category A valves.

Valve	Category	Valve	Category
77-2A	A	77-15A	A
77-2B	A	77-15B	A

4.15.2 The following are valves that were not listed in the IST submittal and were agreed upon to be considered safety related and therefore will be added to the resubmittal as shown.

Valve	Category	Valve	Category
77-2A	A	77-15A	A
77-2B	A	77-15B	A

4.16 Control Rod Drive System: (47W820-1 R9; 47W820-2 R8)

4.16.1 The following are valves that were not listed in the IST submittal and were agreed upon to be considered safety related and therefore will be added to the resubmittal as shown.

Valve	Category
85-39A-1 thru 85-39A-185	B
85-39B-1 thru 85-39B-185	B

4.15.2 The following are valves in the IST submittal that cannot be full stroke exercised every 3 months but will meet the requirements of Section XI. Additional information is required by the NRC to verify the impracticality of full stroke exercising every 3 months.

Valve	Category
85-39A-1 thru 85-39A-185	B
85-39B-1 thru 85-39B-185	B

5.0 MISCELLANEOUS COMMENTS

5.1 Augmented Inspections of Valves - It is recommended that the Nuclear Regulatory Commission (NRC) take a position of requiring augmented inspections for valves that are currently designated as Category E in this IST program, and are proven to be of safety significance.

The Code, to date, has not addressed the generic function of these valves during an accident situation. It is most essential that these safety related valves be in the correct position during an accident situation. Safety related is defined by "NRC Staff Guidance For Preparing Pump and Valve Testing..." dated January 13, 1978. This definition states "safety related are those pump and valves necessary to safely shutdown the plant or mitigate the consequences of an accident." Should these valves be in the incorrect position a safe shutdown may not be possible. The Code chooses to ignore this type of valve with statements of the form: "IWV-1300 Exclusions. Valves that are not covered by this subsection include valves used for operating convenience only such as manual vent, drain, instrument and test valves and valves used for maintenance only."

It is inconsistent to be concerned solely with the operability of some valves (Category A, B, C, and D) when others (Category E valves incorrectly positioned) will nullify the operation of the pumps and Category A, B, C, and D valves. In light of recent events this inconsistency should be addressed and resolved.

The concept of "augmented inspection" is to have periodic visual inspections, with written records, of the position of the valve. This concept might be a method of standardizing the procedures relating to passive valves (Category E, and non-Category E type), position verification. Valves that the NRC should be concerned with are Category E, and non-Category E type valves, such as on the accumulator discharge outlets, valves on either side of safety related pumps, and valves in the ECCS injection path or recirculation path (RWST to RCS, pump to RCS, Emergency Feedwater flow path).

This concept of augmented inspections is not original, the NRC stated it could be used in its November 17, 1976 letter to the Power Authority of the State of New York. This was a generic letter that went to all operating plants. The topic of the letter was NRC Staff Guidance for Complying with 10 CFR 50.55 a (g) Inservice Inspection Requirements.

Conclusion

The Inservice Testing Program submitted by the Tennessee Valley Authority for the Browns Ferry Nuclear Plant - Unit 3, and modified by this evaluation report is in general compliance with the requirements of Section XI of the 1974 Edition and Addenda through the Summer of 1975 of the ASME Boiler and Pressure Vessel Code as required by 10 CFR 50.55 a(g), and NRC Staff guidance letters and briefings. Those items not found to be in compliance with the above require further evaluation.