ENCLOSURE 2

SEQUOYAH NUCLEAR PLANT

UNITS 1 AND 2

SUPPLEMENT TO

PUMP AND VALVE

INSERVICE TESTING PROGRAM

Submitted:_____
Date

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CONTENTS (continued)

1.0 Introduction and Summary

Contained herein is a supplement to the Sequoyah Units 1 and 2 Pump and Valve Inservice Testing (IST) program. This supplement is provided in response to and as required by the safety evaluation report (SER) transmitted to the licensee by letter dated April 5, 1985. This supplement serves to document applicable Section XI items for which relief was granted in the SER, licensee commitment to implement items for which relief was not granted, and all verbal agreements made between the licensee and NRC representatives in a working meeting held subsequent to receipt of the SER. All relief requests granted or denied in the SER will be indicated by (SER) and verbal agreements reached in the working meeting will be designated by (WM). Accordingly sections 2.0 and 3.0 address item by item as presented in sections 2.0 and 3.0 of the SER, with, in most cases, corresponding numerical sequencing to facilitate cross referencing. Several additional items are addressed which were either discussed with NRC representatives at the previously mentioned working meeting, or recently identified by the licensee as IST program changes or corrections; additionally, Appendix D items from the SER are addressed in Section 3.9 of this supplement. Where this text refers to specific paragraphs in Section XI, the paragraph in the 1977 Edition through Summer 1978 Addenda is referenced. The equivalent paragraph in the 1974 Edition through Summer 1975 Addenda may be referenced as required.

2.0 Pump Testing Program

2.1 Pump Testing Frequency

Present regulatory policy requires that all safety related pumps installed in water-cooled nuclear power plants be tested in accordance with the ASME Code, Section XI, Subsection IWP. The purpose of these tests is to collect data to be used in assessing the operational readiness of pumps during their service life.

There are two reasons for conducting periodic pump testing. The first is to record data for assessing operational readiness and the second is to lubricate those bearings of the prime mover and pump which may lose their oil lubrication film due to lack of operation. In order to properly lubricate their bearings, these pumps should be "rolled" or "jogged" for a very short time, in order to supply lubricant to wear surfaces.

Starting and running the pump for the purpose of recording data permits an assessment of operational readiness but also subjects the pump to wear. In determining the most effective and efficient pump test frequency, the benefits of running the pump to record this data must be weighed against the cost in degraded pump integrity and reliability. Pump reliability can be adequately demonstrated (and degradation reduced) by conducting the Section XI pump test quarterly,as is consistent with the operational readiness test for valves as presently endorsed by the ASME code. In addition, the latest NRC-accepted version of the ASME code calls for quarterly testing of safety-related pumps.

2.1 Pump Testing Frequency (continued)

Accordingly, the licensee requested and was granted relief (SER) to fully test each pump quarterly per Section XI.

2.2 Pump Inlet and Differental Pressure Measurements

2.2.1 The licensee has requested and been granted relief (SER) from directly measuring inlet pressure for the essential raw cooling water (ERCW) pumps in accordance with the requirements of Section XI. These pumps are submerged in a pit and do not have installed inlet pressure measurement devices.
As an alternate method, the licensee will calculate inlet pressure from the level of the lake to meet the intent of the Code.

2.2.2 Relief Request - The licensee requested and was denied relief (SER) from measuring inlet and differential pressure for the diesel fuel oil transfer pumps in accordance with the requirements of Section XI. The basis provided by the licensee was that no indication was available to measure inlet or differential pressure.

The Sequoyah units 1 and 2 diesel fuel oil transfer pumps are positive displacement type pumps. Measuring differential pressure on a positive displacement pump does not provide meaningful information as intended by IWP-1600. This consideration was discussed with the NRC and concurrence reached (WM) that this information is not required and relief would be granted.

2.3 Pump Flow and Differential Pressure Measurements

2.3.1 The licensee requested and was granted relief (SER) from comparing flowrate and differential pressure for the ERCW and component cooling water (CCS) pumps with reference values in accordance with code requirements. The nature of the systems that these pumps feed are such that make it impossible to specify a particular flowpath that can be repeated. Alternate testing will compare pump data with a curve of reference values which establishes the relationship between flow and differential pressure in a band around the design point.

2.3.2 The licensee requested and was denied relief (SER) from measuring flowrate for the Sequoyah unit 2 auxiliary feedwater (AFW), centrifugal charging (CCP), and boric acid transfer (BATP) pumps in accordance with the requirements of Section XI. No plant installed instrumentation is available for measuring flowrate for these pumps during quarterly testing.

The requirements for the AFWPs and CCPs will be met through use of ultrasonic flow measuring devices which should become available during the 1985-86 fiscal year. We are requesting relief from the requirements of IWP-4110 (see section 2.3.3). Heat tracing on the boric acid piping precludes use of ultrasonics for measuring flowrate for the BATPs. An alternate lineup for the BATP testing is being examined which would align existing plant flow instrumentation.

2.3.3 Relief Request--Manufacturer specifications for the ultrasonic equipment being procured for the AFWPs and CCPs (see 2.3.2 above) quote an intrinsic accuracy of 1-3%. IWP-4110 requires flowrates to be measured with an accuracy of ±2% of full scale. From discussions with the manufacturer and TVA laboratory calibration technicians and from previous experience in use of ultrasonics for flow measurement, the licensee anticipates highly accurate results. The licensee will require an accuracy of ±3% when employing ultrasonics. The benefits of a possible 1% ircrease in accuracy for an internally installed instrument over the ultrasonics would not warrant the expense of a plant modification. Furthermore, use of externally mounted ultrasonic transducers will preclude incidence of problems inherrently associated with an internally installed measurement device e.g. increased system resistance, flow obstruction, inoperability of system for maintenance or repair. The licensee requests generic relief to employ ultrasonics with a required accuracy of ±3% for all Section XI pumps as desired. This will provide backup equipment which could be quickly used if problems were encountered with plant installed instrumentation. Equivalent degradation detection capability will be provided; relief as requested will not endanger life or property or the common defense and security of the public.

2.4 Pump Vibration Measurements

2.4.1 The licensee requested and was denied relief (SER) from code vibration instrumentation accuracy requirements. The licensee will obtain and maintain vibration test equipment within the code specified accuracy of ±5%.

2.4.2 The licensee requested and was granted relief (SER) from Code vibration requirements for testing the ERCW pumps based on the submerged installation. The ability to detect degradation will be afforded through examination of other available Code-required data. Additionally, the 100% redundancy provided for each of the ERCW pumps required for both units 1 and 2 provides sufficient margin for capacity degradation.

2.5 Pump Bearing Temperature Measurements

2.5.1 The licensee requested and was granted relief (SER) from requirements for measuring pump bearing temperatures for component cooling, containment spray, and boric acid transfer pumps due to lack of installed instrumentation, minimal impact on degradation detection and, availability of other code required data for detecting degradation.

3.0 Valve Testing Program

3.1 General Considerations

3.1.1 Exercising of Check Valves

The NRC's position was stated to the licensee that check valves whose safety function is to open are expected to be full-stroke exercised. Since the disc position is not always observable, verification of the maximum flowrate through the check valve identified in any of the plant's safety analyses presents an adequate demonstration of the full-stroke requirements. Any flowrate less than this will be considered partial-stroke exercising unless it can be shown that the check valve's disc position at the lower flow rate would permit maximum required flow through the valve. This reduced flow rate method of demonstrating full-stroke capability is the only test that requires measurement of the differential pressure across the valve.

3.1.2 Valves Identified for Cold Shutdown (CSD) Exercising

In accordance with paragraph IWV-3412(a) of the Code, the licensee has identified valves for which exercising quarterly during plant operation is not practical and are therefore to be exercised during CSDs at a frequency not to exceed once per three months. Classifying valves as CSD valves has been done from both necessity in some cases and, in some cases, from practical considerations. The intent is not, however, meant to restrict valve testing conditions beyond the extent defined by the plant Technical Specifications or practical operating constraints. Section XI does not address plant defined operating modes for non-power operation. Accordingly differentiation has not been made in the IST Pump and Valve Testing Program between valves tested in various plant standby or shutdown conditions. All valves which cannot be tested quarterly at power are identified as CSD valves. For valves identified for testing during CSDs, testing will be performed during CSDs and refueling outages (ROs). Valves identified for testing at refueling outages will be tested at ROs only.

3.1.3 Conditions for Valve Testing During CSDs

CSD valve testing as identified by the licensee will be conducted pursuant to the following conditions:

Valve testing will commence as soon as possible, but no later than 48 hours after reaching CSD conditions. Valve testing will proceed in a normal manner until all testing is complete or the plant is ready to return to power. A completion of all valve testing is NOT a prerequisite to return to power. Any testing not completed by the end of one cold shutdown will be performed during subsequent cold shutdowns, starting from the last test performed at the previous cold shutdown.

3.1.3 Conditions for Valve Testing during CSDs (continued)

For planned cold shutdowns, where ample time is available and testing of all valves identifed for cold shutdown test frequency in the IST program will be completed, exceptions to the 48-hour requirement may be taken.

3.1.4 Category A Valve Leak Test Requirements for Containment Isolation Valves (CIVs)

Relief Request - All CIVs that are Appendix J, Type C, leak tested are included in the IST program as Category A or A/C valves. The licensee requested and was granted relief (SER) from paragraphs IWV-3420(a) through -3420(e) (1974 Edition through Summer 1975 Addenda) and paragraphs IWV-3421 through -3425 (1977 Edition through Summer 1978 Addenda) for CIVs on the basis that the applicable leak test procedures and requirements are met by 10CFR50, Appendix J testing. However, relief was not granted (SER) from complying with Analysis of Leakage Rates and Corrective Action requirements of IWV-3426 and IWV-3427, respectively. The licensee, at this time, requests specific relief from trending leakrates and performing corrective actions per IWV-3427 for CIVs and presents below the alternate method used for meeting the intent of IWV-3426 and IWV-3427.

CIVs which are leaktested in accordance with the requirements of 10CFR50, Appendix J, are assigned conservative reference leakrates based upon the valve size and the total allowable containment penetration leakage, 0.6 La. The total of all of the reference leakrates is set equal to approximately 40% of the total allowable containment leakage, i.e., 40% of (0.6 La); this provides a comfortable margin even if all valves are leaking their respective reference leakrates. If a maximum permissible leakrate is not specified by the owner (licensee), IWV-3426, as a guideline, recommends a permissible leakrate equivalent to 0.3125 scfh per inch valve size; the reference leakrate assigned to CIVs from the preceding methodology corresponds to 0.06 scfh per inch valve size, less than one fifth the Code guideline.

During refueling outages maintenance is performed, if required, in an attempt to restore all CIVs to below their reference leakrates and as close to zero leakage as reasonably achievable; this ensures the ability of the containment system to satisfy the Integrated Leak Rate Testing criteria and to provide adequate margin for valve degradation over the next fuel cycle. While every attempt is made to maintain CIVs at zero leakage or below their reference leakrates at all times, a valve leaking in excess of its reference value may remain operable and left "as is" in certain situations, provided that an evaluation by plant management (i.e., supervisory personnel or designated senior level engineer) finds it acceptable. An example of such a situation would be a valve found to be leaking in excess of its reference leakrate in mid fuel cycle, and for which all reasonable on-line maintenance efforts have been made. Such

3.1.4 Category A Valve Leak Test Requirements for CIVs (continued)

evaluation shall be based upon consideration of the effects on overall containment leakage and possible effects on adjacent piping and components, as well as consideration of time, cost, unit operations, and radiological exposure required for corrective measures. While the maximum permissible leakrate at this time would, by plant technical specifications, be limited to the current margin between overall containment leakage and 0.6 La, maximum single penetration leakage is at all times administratively limited to 20% of 0.6 La. Any such valve, exceeding the reference leakrate but not in excess of 20% of 0.6 La, would be repaired or replaced no later than the next refueling outage or even during the next CSD of sufficient duration if practical.

The above described methodology for setting and maintaining ultra conservative maximum leakrates ensures system operability and provides reasonable assurance of valve leak-tight integrity intended by the Code. At the same time flexibility is provided to prudently operate until the next refueling outage (or lengthy cold shutdown). For these reasons relief as requested will not endanger life or property or the common defense and security of the public.

3.1.5 Application of 10CFR50 Appendix J Testing to the IST Program

Although the Appendix J review for Sequoyah Units 1 and 2 is separate from the IST program review, determinations made by the Appendix J review are directly applicable to the IST program. Should the Appendix J program be amended, the IST program will be amended accordingly.

3.1.6 Valves Whose Function is Safety Related

The IST program addresses valves whose function is safety related. Valves whose function is important to safety are defined as those valves that are needed to mitigate the consequences of any accident and/or to shut down the reactor and to maintain the reactor in a shutdown condition. Valves in this category typically include certain ASME Code Class 1, 2, and 3 valves and could include some non-Code class valves. Valves whose function is not safety related may be added to the IST program by the licensee as a decision on their part to expand the program.

3.1.7 Test Frequency of Check Valves (CVs) Tested at CSDs

All CSD Category C CVs, except for as granted specific relief, will be tested once every three months, the same frequency as required for Category A and B valves.

3.1.8 Valves Which Perform a Pressure Boundary Isolation Function (PSIVs)

Several safety systems connected to the reactor coolant system (RCS) pressure boundary have design pressures below the reactor coolant system operating pressure. Redundant isolation valves within the Class 1 boundary forming the interface between these high and low pressure systems protect the low pressure systems from pressures which exceed their design limit. In this role, the valves perform a pressure isolation function.

The following is a list of valves for the Sequoyah Units 1 and 2 which perform a pressure isolation function as described above.

Safety Injection System (SIS)

63-543, SIS check valve to RCS loop 1 hot leg
63-545, SIS check valve to RCS loop 3 hot leg
63-547, SIS check valve to RCS loop 2 hot leg
63-549, SIS check valve to RCS loop 4 hot leg
63-551, SIS check valve to RCS loop 1 cold leg
63-553, SIS check valve to RCS loop 2 cold leg
63-555, SIS check valve to RCS loop 3 cold leg
63-557, SIS check valve to RCS loop 4 cold leg
63-558, SIS check valve to RCS loop 4 hot leg
63-559, SIS check valve to RCS loop 2 hot leg
63-560, check valve to RCS loop 1 cold leg
63-561, check valve to RCS loop 2 cold leg
63-562, check valve to RCS loop 3 cold leg
63-563, check valve to RCS loop 4 cold leg
63-622, SIS Accumulator Number 1 discharge check valve
63-623, SIS Accumulator Number 2 discharge check valve
63-624, SIS Accumulator Number 3 discharge check valve
63-625, SIS Accumulator Number 4 discharge check valve
63-632, RHR check valve to RCS loop 2 cold leg
63-633, RHR check valve to RCS loop 1 cold leg
63-634, RHR check valve to RCS loop 3 cold leg
63-635, RHR check valve to RCS loop 4 cold leg
63-640, RHR check valve to RCS loop 1 hot leg
63-641, RHR and SIS check valve to RCS loop 1 hot leg
63-643, RHR check valve to RCS loop 3 hot leg
63-644, RHR and SIS check valve to RCS loop 3 hot leg

Residual Heat Removal System (RHR)

FCV-74-1, RHR suction isolation valve from RCS loop 4 hot leg
FCV-74-2, RHR suction isolation valve from RCS loop 4 hot leg

3.1.8 Valves Which Perform a Pressure Boundary Isolation Function (PSIVs) (continued)

Upper Head Injection System (UHI)

FCV-87-7, Charging header isolation valve to UHI header
FCV-87-8, Charging header isolation valve to UHI header
87-558, UHI line check valve
87-559, UHI line check valve
87-560, UHI line check valve
87-561, UHI line check valve
87-562, UHI header check valve
87-563, UHI header check valve

All of the above valves have been Categorized A or A/C as appropriate and listed in the Sequoyah Units 1 and 2 IST program. All of the above valves, with the exception of FCV-87-7 and FCV-87-8, are listed in the Sequoyah Units 1 and 2 Technical Specifications list of pressure isolation valves. A Technical Specification revision will be submitted to add FCV-87-7 and FCV-87-8 to the list of pressure isolation valves. The revision proposes to remove the entire list of valves from the Technical Specifications and reference the valve list which will be included in section 6.8 of the FSAR for Sequoyah.

3.1.9 Pressurizer Power Operated Relief Valves (PORVs)

The pressurizer PORVs are included in the IST program as Category B valves and tested to the requirements of Section XI. Since the PORVs have shown a high probability of sticking open and are not needed for overpressure protection during power operation, routine exercising during power operation is considered by the NRC to be "not practical" and, therefore, not required. The PORV's function during reactor startup and shutdown is to protect the reactor vessel and coolant system from low temperature-overpressurizatrion conditions and should be exercised prior to initation of system conditions for which vessel protection is needed.

The following test requirements for the PORVs are included in the Sequoyah Units 1 and 2 IST program:

1. Full stroke exercising shall be performed at each* cold shutdown or, as a minimum, once each refueling cycle.

2. Stroke timing shall be performed at each* cold shutdown or, at a minimum, once each refueling cycle.

3. Fail safe actuation testing shall be performed at each* cold shutdown.

3.1.9 Pressurizer Power Operated Relief Valves (PORVs) (continued)

4. The PORV block valves are included in the IST program in order to assure protection against a small break LOCA should a PORV fail open.

*The conditions described in section 3.1.3 regarding CSD testing is not applicable to the PORVs. In the case of frequent CSDs, testing of the PORVs is not required more often than once each three months.

3.2 Generic Relief Requests

3.2.1 Stroke Timing

The licensee had identified the following valves in Appendix C of the previous submittal as valves which were cycled only and not timed. This notation did not reflect the actual testing status of these valves in the Sequoyah Units 1 and 2 IST program. The main steam and ERCW valves are stroked and timed in accordance with the requirements of Section XI. The motor driven (M-D) AFWP discharge pressure control valves have been removed from the system and replaced with cavitating venturi's. These valves are accordingly removed from the IST program.

Main Steam Atmospheric Dump Valves: PCV-1-5, PCV-1-12, PCV-1-23, PCV-1-30

ERCW Inlet Isolation Valves to EGTS Room Coolers: FCV-67-336, FCV-67-338

M-D AFWP Discharge Pressure Control Valves: PCV-3-122, PCV-3-132

3.2.2 Corrective Actions for Valve Exercising and Valve Leak Testing

Relief Request--The licensee requested and was denied relief (SER) from performing corrective action requirement of paragraphs IWV-3417 and -3523 of Section XI. The licensee had stated the corrective actions of components in safety systems as being adequately addressed in the LCOs of plant technical specifications but had not provided sufficient information in the submittal to support this position. The additional justification is provided below and was discussed with the NRC. Concurrence was reached (WM) that since requirements of the Technical Specifications are more restrictive than IWV-3417 and -3523, a relief request for these paragraphs is not needed, i.e., the licensee is meeting the requirements of IWV-3417 and -3523.

IWV-3417 requires that if a Category A or B valve fails to test satisfactorily (valve exercising) that corrective action be taken immediately; if the condition is not corrected within 24 hours, the valve should be declared inoperable. If repairs are necessary due to CSD testing, the repairs shall be made prior to startup. A retest showing acceptable operation shall be run following any repairs before returning the valve to service.

3.2.2 Corrective Actions for Valve Exercising and Valve Leak Testing (continued)

Sequoyah Units 1 and 2 Technical Specifications regarding corrective actions are more restrictive than those identified in IWV-3417. By the technical specification definition of OPERABLE, no grace period is allowed before a device that is not capable of performing its specified function is declared inoperable. LCO 3.0.4 and specific LCOs adequately address changes in OPERATIONAL MODES with inoperable equipment to ensure against entry into a condition without required safety related equipment. The definition of OPERABLE, again requires an acceptable retest to prove the component capable of performing its intended function prior to declaring the component (i.e. valve) operable.

IWV-3523 requires the same corrective actions for Category C CVs as described above for Category A and B valves. The same discussion as presented above, for IWV-3417 applies for IWV-3523.

Not addressed in the licensee's previous submittal was paragraph IWV-3427 of the Code: IWV-3427(a) requires that valves with leak rates exceeding owner specified values shall be replaced or repaired. The licensee has identified maximum permissible leakrates for all Section XI leak tested valves; any valve exceeding the maximum permissible leakrates is either repaired or replaced in accordance with this requirement prior to returning the valve operable. The two principal types of valves for which this is applicable are CIVs and PSIVs. Applicability to CIVs is previously discussed in Section 3.1.4. For PSIVs, this requirement is adequately addressed by plant Technical Specifications LCO 3.4.6.2 and the definition of OPERABLE. (See discussion above regarding compliance with IWV-3417.)

IWV-3427(b) requires that for valves of $\geq$6 inch size which have leak rates such that the margin from the previous measured leak rate to the maximum permissible leak rate is decreased by >50%, that test frequency will be doubled until corrective action taken; this increased frequency will coincide with CSDs. Additionally, if tests show leakage increasing with time, and a projection based on three or more tests indicates that the leak rate of the next test will exceed the maximum by more than 10%, then the valve must be replaced or repaired.

The two principal types of valves for which this is applicable are CIVs and PSIVs. The applicability to CIVs is previously discussed in Section 3.1.4. The applicability of IWV-3427(b) to Sequoyah PSIVs, with the exception of FCV-74-1 and FCV-74-2, is not practical and cannot be performed to meet the intent of the Code for the following reasons. PSIVs are leak tested to meet the requirements of Technical Specification 3.4.6.2 of less than or equal to 1 gpm per valve. The Sequoyah Units 1 and 2 testing systems are such that often more than one valve in parallel is

3.2.2 Corrective Actions for Valve Exercising and Valve Leak Testing (continued)

being tested at a time. Additionally, the leak test system is such that many leak test lines may feed into the leakage path. Therefore a leaking test system valve could add to the measured leakage; that is, the leak rate could be coming from the tested valve, from test line valves or both. If the combined leakage is less than 1 gpm then Technical Specifications are guaranteed satisfied for the individual valves; a leak rate for each valve, however, cannot be determined. For these reasons, trending of leakrates is meaningless for the purpose of monitoring for valve degradation.

The Code intent of monitoring leak rates is to assess functional readiness and detect component degradation. The purpose of this is to project/predict incipient valve failure and enable corrective actions to be taken prior to that point. It is sound operating procedure to analyze available information and perform planned maintenance rather than forced maintenance which could be caused by unexpected valve failure. From a safety consideration, however, plant design and technical specifications adequately address functional readiness through component redundancy, LCOs, surveillance requirements, and specified surveillance intervals. LCO 3.4.6.2 specifies a maximum leakrate for each redundant PSIV and a corresponding surveillance interval which, when combined, provide a high level of confidence in valve functional readiness until the next scheduled surveillance, even accounting for degradation. Additionally, the associated systems are equipped with relief valves which further ensure against overpressurization of lower pressure safety related systems.

For the above described reasons, the licensee requests relief from the requirements of IWV-3427 for all listed pressure isolation valves with the exception of FCV-74-1 and FCV-74-2. (These valves will not be trended when an outstanding design change request is implemented which ties FCV-74-1 and FCV-74-2 into the CV test system.) The incremental benefits would be non-existent for practical purposes, there would be no assurance that degradation had occurred, and trending and performing maintenance on CVs leaking <1 gpm would be unjustified for ALARA, maintenance cost and unit down time considerations; neither functional readiness nor protection of the public would be enhanced. Relief as requested will not endanger life or property or the common defense and security of the public.

3.2.3 Testing of Valves Which Were Previously Out of Service

Relief Request--The license requested and was denied relief (SER) from the requirements for testing valves in systems which are out of service before returning those systems to operating status, per IWV-3416 of Section XI. The licensee stated that these requirements are adequately covered in the Sequoyah Technical Specifications and plant procedures but had not provided sufficient information in the submittal to support this position. The

3.2.3 Testing of Valves Which Were Previously Out of Service (continued)

additional justification is provided below and was discussed with the NRC. Concurrence was reached (WM) that the below described procedure for testing of valves on systems previously out of service adequately assures operability of components in systems previously out of service.

IWV-3416 says for a valve in a system declared inoperable or not required to be operable, the exercising test schedule need not be followed. Within 30 days prior to return of the system to operable status, the valves shall be exercised and the schedule resumed in accordance with requirements of this Article.

If a system is declared inoperable for the reason of a failure of a valve, then the valve will be exercised and tested satisfactorily prior to returning the system to operable status. This is provided for by the technical specifications definition of OPERABLE. If, however, a system is declared inoperable or is not required to be operable for some other reason than valve problems, e.g., a pump is tagged for maintenance, then the system valves do not have to be exercised prior to returning the system operable provided the valve exercising schedule is in the required frequency; in this case, the applicable pump test would be run to determine operability of the system. For an extended outage or period for which the system is not operable or required to be operable, the respective valve exercising must only be in frequency prior to declaring the system operable. Relief is therefore requested only from the 30 day requirement, i.e., valve exercising must only be in frequency (e.g., exercised within 90 days) prior to returning the system operable.

3.2.4 Category E Valves

The licensee requested and was denied relief (SER) from including the Sequoyah Unit 1 Category E valves in the IST program listing. The licensee cited the lack of testing requirements for Category B-Passive valves per the Code (Table IWV-3700-1). Additionally, the 1977 Edition through Summer 1978 Addenda of the Section XI Code does not identify Category E valves as a IWV-2200 defined category; this results in exclusion of Sequoyah Unit 2 Category E valves from any Section XI Code requirements. The relief request was to facilitate code application consistency where practical and avoid potential confusion over different requirements for the two units.

The NRC position held in denying relief was that if the licensee was utilizing the 1974 Edition through Summer 1975 Addenda, then the applicable Category E valves must be included in the IST program valve listing and the requirements of IWV-3700 (1974 Edition through Summer 1975 Addenda) must be performed. All unit 1 locked open or locked closed valves have been included in the IST valve listing, Appendix E.

3.2.5 Containment Isolation Valves

The licensee requested and was granted relief (SER) from leak testing CIVs which are CIVs only in accordance with the requirements of Section XI and was permitted testing CIVs in accordance with the requirements of 10CFR50, Appendix J. All CIVs that are Appendix J, Type C leak tested have been included in the IST program as Category A or A/C valves. The applicable leak test procedures and requirements for CIVs are determined by 10CFR50, Appendix J, and will give reasonable assurance of valve leak-tight integrity intended by the Code.

3.3 Chemical and Volume Control System (CVCS)

3.3.1 Category C Valves

3.3.1.1 The licensee requested and was granted relief (SER) from exercising 62-525 and 62-532, centrifugal charging pump discharge CVs, in accordance with the requirements of Section XI. Full flow exercising during power operations would result in undesirable RCS boron concentration and system pressure, temperature and level transients; full stroke exercising these valves at CSDs would result in RCS system pressure and level transients due to limitations of letdown capability. The licensee will partial stroke these valves quarterly and full stroke exercise them during refueling outages.

3.3.1.2 The licensee requested and was granted relief (SER) from exercising 62-504, centrifugal charing pump suction CV from the RWST in accordance with the requirements of Section XI. Full flow exercising during power operations would result in undesirable RCS boron concentration and system pressure, temperature and level transients; full stroke exercising this valve at CSD would result in RCS system pressure and level transients due to limitations of letdown capability. The licensee will backseat the valve quarterly, partial stroke exercise the valve at CSDs and full stroke exercise during refueling outages.

3.4 Safety Injection System

3.4.1 Category A/C Valves

3.4.1.1 The licensee requested and was granted relief (SER) from exercising valves 63-543, -545, -547, -549, -551, -553, -555, -557, -558, and -559 in the injection lines from the safety injection pumps to the RCS loops, in accordance with the requirements of Section XI.

The safety injection pumps do not develop sufficient head to overcome normal RCS pressure. Use of another pump would result in undesirable boron concentration and system pressure, temperature and level transients. Letdown capability will not allow full flow testing with the reactor head on. Technical Specification 4.4.6.2.2 requires these valves to be leak tested following valve

3.4.1.1 (continued)

actuation and during cold shutdown if they have not been leak tested in the last nine months; exercising these valves at a greater frequency would therefore necessitate technical specification leak testing at the same increased frequency.

The licensee will partial stroke these valves during CSDs not to exceed once per nine months, full-stroke exercise these valves each refueling outage, and verify valve closure during cold shutdowns not to exceed once per nine months when the valves are leak tested as required by Technical Specification 4.4.6.2.2.

3.4.1.2 The licensee requested and was granted (SER) relief from exercising valves 63-632, -633, -634, -635, -640, -641, -643, and -644 on the RHR injection lines to the RCS loops in accordance with the requirements of Section XI. The residual heat removal pumps do not develop sufficient head to overcome normal RCS pressure. Use of another pump could result in undesirable boron concentration and system pressure/temperature/level transients. Technical Specification 4.4.6.2.2 requires these valves to be leak tested following valve actuation and during cold shutdowns if they have not been leak tested in the last nine months; exercising these valves at a greater frequency than once every nine months would impose an additional leak testing requirement on these valves which could result in delaying plant startup. The CVs can only be verified closed through the leak testing performed per Technical Specification 4.4.6.2.2.

The licensee will full stroke exercise these valves during cold shutdowns at a frequency no greater than once per nine months and verify valve closure during CSDs at a frequency no greater than once per nine months when the valves are leak tested as required by Technical Specification 4.4.6.2.2.

3.4.1.3 The licensee requested and was granted relief (SER) from exercising valves 63-622, -623, -624, -625, safety injection accumulator outlet CVs in accordance with the requirements of Section XI, contingent upon providing a method for verifying full flow capability of the valves.

These valves cannot be exercised during power operation because neither the safety injection accumulators, residual heat removal pumps, or safety injection pumps develop sufficient head to overcome reactor coolant system pressure. These valves cannot be exercised at full flow without removing the fuel from the core, removing the internals package and causing a rapid depressuriation of the RCS. Technical Specification 4.4.6.2.2 requires these valves to be leak tested following valve actuation and during cold shutdown if they have not been leak tested in the last nine months. Partial stroking of these valves during CSDs can be performed using either the safety injection or residual heat removal pumps through the check valve test system lines. If these

3.4.1.3 (continued)

valves are partial stroked at a frequency greater than once per nine months, an additional leak testing requirement would be imposed on these valves which could result in delaying plant startup. These valves can only be verified closed by performing the leak testing per Technical Specification 4.4.6.2.2. These valves cannot be full flow tested with flow from the safety injection accumulators in accordance with Section XI requirements without risking damage to the reactor vessel.

The licensee will partial stroke and verify these valves are closed at CSDs at a frequency not greater than once per nine months. As an alternate to full flow testing, the licensee will disassemble one of the four valves each refueling outage, on a rotating basis, in order to verify the operability of the valves. If a valve is found to be inoperable and the cause determined to be potentially generic, then the other three valves will be disassembled and inspected before the valves can be declared operable.

3.4.1.4 The licensee requested and was granted relief (SER) from exercising valves 63-560, -561, -562, -563, common CVs from the safety injection accumulators, safety injection system, and residual heat removal system to the RCS cold legs, in accordance with the requirements of Section XI contingent upon providing a method for verifying full flow capability of the valves.

These valves cannot be exercised during power operation because the safety injection accumulators, safety injection pumps, or residual heat removal pumps cannot develop sufficient head to overcome normal RCS presssure. These valves cannot be full flow exercised at CSDs without removing the fuel from the core, removing the internals package, and causing a rapid depressurization of the RCS. Technical Specification 4.4.6.2.2 requires these valves to be leak tested following valve actuation and during CSD if they have not been leak tested in the last nine months. These valves can be partial stroke exercised using safety injection or residual heat removal pumps during CSD. If these valves are partial stroke exercised at CSD at a frequency greater than once per nine months, an additional leak test requirement may be imposed on part of these valves which could delay startup. These valves cannot be full flow exercised per Section XI without risking reactor vessel damage. These valves can only be verified closed by leak testing performed by Technical Specification 4.4.6.2.2.

The licensee will partial stroke exercise and verify valve closure at CSDs at a frequency not to exceed once per nine months. As an alternate to full flow testing, the licensee will disassemble one of the four valves each refueling outage, on a rotating basis, in order to verify the operability of the valves. If any valve is found to be inoperable and the cause determined to be potentially generic, then the other three valves will also be disassembled and inspected before the valves can be declared operable.

3.4.2 Category C Valves

3.4.2.1 The licensee requested and was granted relief (SER) from exercising valve 63-502, CV in suction line from the refueling water storage tank (RWST) to the residual heat removal pumps, in accordance with the requirements of Section XI.

The RHR pumps do not develop sufficient head to overcome normal RCS pressure. The pump recirculation path does not contain this CV. The refueling cavity dewatering line cannot be used because the required valve alignment would result in degrading both trains of RHR. Letdown capabilities preclude use during CSDs. Backseating this CV would require closure of FCV-63-1 and inoperability of both trains of low head SIS. This valve will be verified closed during CSDs and full-stroke exercised during refueling outages.

3.4.2.2 The licensee requested and was granted relief (SER) from exercising valve 63-510, CV in suction line from RWST to safety injection pumps, in accordance with the requirements of Section XI.

The SI pumps do not develop sufficient head to overcome normal RCS operating pressure. The recirculation line will not pass full flow. Letdown capabilities preclude full flow exercising at CSD. This CV will be partial stroked quarterly during the SIS Section XI pump test and full flow exercised each refueling outage during the system performance tests.

3.4.2.3 The licensee requested and was granted relief (SER) from exercising valves 63-524 and 63-526, safety injection pump discharge CVs in accordance with the requirements of Section XI.

The SI pumps do not develop sufficient head to overcome normal RCS operating pressure. Letdown capabilities preclude full flow exercising in CSD. These valves are in direct series line-up with the PIVs which require leak testing at a frequency not to exceed nine months unless actuated. These CVs will be verified closed quarterly, partial stroke exercised during CSDs at a frequency not to exceed once per nine months, and full stroke exercised during refueling outages.

3.4.2.4 The licensee requested and was granted relief (SER) from exercising valves 63-581, 63-586, 63-587, 63-588, and 63-589, check valves in the lines from the boron injection tank to the reactor coolant system cold legs, in accordance with the requirements of Section XI.

Exercising these valves during power operation would result in discharging heavily borated water from the boron injection tank into the reactor, resulting in a reactivity transient and possible reactor trip. These valves cannot be partial stroke exercised during power operation utilizing the boron injection tank bypass line since this could result in a temperature transient which could cause thermal shock to the injection nozzles. Letdown capability precludes full flow exercising these valves during CSDs. These valves will be partial stroke exercised during CSDs and full stroke exercised on refueling outages during system performance tests.

3.5 Containment Spray System (CS)

3.5.1 Category C Valves

3.5.1.1 The licensee requested and was granted relief (SER) from exercising valves 72-547, 72-548, 72-555, and 72-556, containment and residual heat removal spray header check valves, in accordance with the requirements of Section XI contingent upon providing a method for verifying full flow capability of the valves.

Testing these valves with water would deluge containment, causing potential significant damage and cleanup requirements to equipment and structures. The licensee proposed testing these valves with air during the spray header nozzle test required by Technical Specification 4.6.2.1 at least once every five years. The NRC position stated that this method could not ensure full stroking of the CVs. As an alternate to full flow testing, one of these four CVs will be disassembled each refueling outage on a rotating basis. If any valve is found to be inoperable and the cause determined to be potentially generic, then the other valves must also be disassembled and inspected before being declared operable.

3.6 Emergency Diesel System

3.6.1 Category B Valves

3.6.1.1 The licensee requested and was granted relief (SER) from measuring the stroke time of the diesel air start valves in accordance with the requirements of Section XI. The stroke time of the air start valves cannot be measured as there is no visible stem movement or indication. The stroke time is verified as acceptable by verifying the diesel comes up to speed in <10 seconds as required by Technical Specifications.

3.7 Upper Head Injection System

3.7.1 Category A/C Valves

The licensee requested and was granted relief (SER) from exercising valves 87-558, 87-559, 87-560, 87-561, 87-562, and 87-563, check valves in the Upper Head Injection lines, in accordance with the requirements of Section XI, contingent upon providing a method for verifying full flow capability of the valves.

The UHI system does not have sufficient head to overcome reactor coolant system pressure. Use of the charging system would require removal of both trains of UHI from service to prevent overpressurization of the system, and could result in severe thermal shock problems. Full stroke exercising these valves with system flow during CSDs or refueling outages would require removing all fuel from the reactor, removing the reactor internals, installing a temporary impingement plate, and draining the reactor coolant system.

3.7.1 Category A/C Valves (continued)

These valves will be verified to close on CSDs not to exceed once per nine months when the CVs are leak tested per Technical Specification 4.4.6.2.2, and partial stroke exercised on CSDs not to exceed once per nine months so as not to impose an additional leak testing requirement on these valves per Technical Specification 4.4.6.2.2. As an alternate to full flow exercising, the 8-inch CVs will be manually stroked each refueling outage and one 12-inch CV will be disassembled each refueling outage, on a rotating basis. If any 12-inch valve is found to be inoperable then the other 12-inch valve must also be disassembled and inspected before being declared operable.

3.8 Reactor Coolant System

3.8.1 Category B Valves

The licensee requested and was granted relief (SER) from visually observing that the remote position indicators for pressurizer power operated relief valves PCV-68-340A and PCV-68-334 are accurately reflecting actual valve positions. The pressurizer PORVs are fast-acting, totally enclosed solenoid valves, preventing visual determination of valve position. As alternate testing, the licensee will verify the indicated valve positions by observing tailpipe temperature before and after stroking the PORVs at refueling outages, but not less than once every two years.

3.9 Additional Valve Testing Requirements

The Sequoyah Units 1 and 2 SER provided an Appendix D listing of IST program additions and notes related to the previous submittal and subsequent review. The following provides the licensee proposed adaptation or ommision of the additional requirements into the Sequoyah Units 1 and 2 IST program. Relief requests are identified accordingly. Additionally several proposed changes to the IST valve program are submitted due to changes in system and/or valve configuration.

3.9.1 Pressurizer Auxiliary Spray Line Check Valve

The licensee maintains CV 62-661 is not safety related and therefore should not be added to the IST program; additionally, the licensee maintains the auxiliary spray valve PCV-62-84 should also be deleted from the IST program. The following justification was presented to the NRC and concurrence reached (WM) that these valves need not be included in the IST program.

The IST program addresses valves which are safety related as defined in section 3.1.6 of the SER and this submittal. During the NRC-TVA working meeting held in 1982, the auxiliary spray valve PCV-62-84 was added to the IST program at the suggestion of the licensee; at that time, the licensee pressurizer PORVs were not

3.9.1 Pressurizer Auxiliary Spray Line Check Valve (continued)

safety-grade valves. The previous valves were air operated and would fail during a phase B accident when control air is isolated to containment. Since that time, the PORVs have been changed out to faster, solenoid actuated valves to meet the more stringent requirements for cold overpressurization protection. The normal sprays and pressurizer PORVs provide functional diversity and redundancy for pressure reduction capability in a post accident condition. Therefore, loss of the auxiliary spray valves would provide no compromise to safety or affect any safety analyses.

3.9.2 Diesel Fuel Oil Transfer Pump Discharge Check Valves

The diesel fuel oil transfer pump CVs have been added to the Sequoyah Units 1 and 2 IST program by the licensee. The CVs will be full flow tested and backseated quarterly during performance of the Section XI pump tests.

3.9.3 Inlet Check Valves to the Diesel Starting Air Tanks

The inlet CVs to the diesel starting air receivers have been added to the Sequoyah Units 1 and 2 IST program. The CVs will be full flow exercised by verification of receiver pressure increase on compressor start and verified closed by observing receiver pressure following compressor shutdown.

3.9.4 CVCS Relief and Check Valves

3.9.4.1 Relief Valves

The CVCS relief valves 62-505, 62-518, and 62-688 have been added to the Sequoyah Units 1 and 2 IST program.

3.9.4.2 Check Valves

3.9.4.2.1 The licensee does not consider valve 62-543, the CVCS CV in the charging line to the regenerative heat exchanger, to be a safety-related valve subject to testing requirements of Section XI. The basis for this position as described below was discussed with the NRC and concurrence reached (WM) that the valve need not be added to the IST program.

This CV is safety-related only in the closed position as a CIV; it is not a PSIV by definition. Its safety-related function is being the first barrier of containment isolation (the closed, qualified system is the second barrier). Relief has been granted from the code paragraphs IWV-3421 through IWV-3425 for CIVs on the basis that applicable leak test requirements are met by 10CFR50, Appendix J testing (see section 3.1.4). However, this valve is not Appendix J tested as a CIV because: 1) it would leak into a closed, qualified system; 2) the injected pressure would always exceed 1.1 Pa; and 3) there is a guaranteed 30-day water supply to the the centrifugal charging pumps.

3.9.4.2.1 (continued)

Summarizing, the licensee and NRC concur that 10CFR50, Appendix J requirements do not require testing of this CV for the previously listed reasons. Accordingly, as a non-tested Appendix J valve, it will not be added to the IST program.

3.9.4.2.2 The licensee does not consider valves 62-560, 62-561, 62-562, 62-563, secondary CVs on the reactor coolant pump seal injection lines, to be safety related valves subject to testing requirements of Section XI. The basis for this position as described below was discussed with the NRC and concurrence (WM) reached that the valves need not be added to the IST program.

These CVs are safety related only in the closed position as CIVs; they are not PSIVs by definition. Their safety-related function is being the first barrier of containment isolation (the closed, qualified system is the second barrier). Relief has been granted from the Code paragraphs IWV-3421 through IWV-3425 on the basis that applicable leak testing requirement are met by 10CFR50, Appendix J testing (see section 3.1.4). However, these valves are not Appendix J tested as CIVs because: 1) any leakage would be into a closed, qualified system; 2) the injected pressure would always exceed 1.1 Pa; and 3) there is a guaranteed 30-day water supply to the centrifugal charging pumps.

Summarizing, the licensee and NRC concur that 10CFR50, Appendix J requirements do not require testing of these CVs for the above listed reasons. Accordingly, as non-tested Appendix J valves, they will not be added to the IST program.

3.9.5 Reactor Coolant System

3.9.5.1 Relief Request--The RCS valve 68-559, CV on the line from the SIS/CS relief valve header located outside containment to the pressurizer relief tank (PRT), serves two safety related functions. The first is to open upon lifting of any SIS or CS system relief valve to provide a relief path to the PRT. The second function is to close as a CIV.

Significant problems exist for full flow exercising this CV in accordance with the requirements of Section XI. Full flow exercising, by definition (see Section 3.1.1), is not possible due to the nature of the system, i.e., cannot lift all relief valves at setpoint pressures. Partial stroke exercising would present unacceptable personnel hazards unless all interacting systems were removed from service; these systems include RCS, CVCS charging/seal flow/letdown, RHR, SIS, and CS systems. Removal from service of the affected systems would require entry into LCOs and an overall degraded plant condition regardless of operating mode. Additionally, plant operating experience has shown that this CV does function to provide release to the PRT as indicated by PRT temperature, pressure, and level increases. For these reasons the licensee is requesting relief from valve exercising requirements of paragraph IWV-3520 of Section XI.

3.9.5.1 (continued)

This CV is a CIV but is not Appendix J tested because: 1) any leakage would be into a closed, qualified system, 2) the injected pressure would always exceed 1.1 Pa, and 3) a guaranteed 30-day water supply is provided for SIS, CCP and CS pumps. Relief has been granted from the Code paragraphs IWV-3421 through IWV-3425 for CIVs on the basis that applicable leak testing requirements are met by 10CFR50, Appendix J testing (see Section 3.1.4). However, this CV is a non-Appendix J tested CIV. The licensee and NRC concur that 10CFR50 Appendix J requirements do not require testing of this CV for the previously listed reasons. Accordingly, this valve is not required to be leak tested in accordance with the requirement of Section XI.

3.9.5.2 The reactor head vent system valves FSV-68-394, FSV-68-395, FSV-68-396, FSV-68-397 have been added to the IST program. These valves are Target Rock valves, similar to the pressurizer PORV's, which have shown a high probability of sticking open. Inappropriate or inadvertent operation of this system due to valves sticking open could create an unanalyzed condition or worsen the severity of an analyzed faulted condition. Due to the risk of stroking these valves, the licensee requests relief to exercise these valves at refueling outages only, the same frequency as proposed for future Technical Specification surveillance testing.

These valves are totally enclosed, preventing visual confirmation of valve position as required by IWV-3300. FSV-68-394 and FSV-68-395, used as block valves, can be verified open and closed by observing appropriate changes in downstream temperature following valve actuation. FSV-68-396 and FSV-68-397 are used as throttle valves; due to valve size and operation, confirmation of valve position by pressure/level/temperature changes in the PRT may or may not provide clear indication. Accoustic emissions equipment, currently under requisition, should augment or possibly suffice for valve position verification capability. Both of these methods will be evaluated when the system becomes operational to determine the most accurate means for verifying valve position.

3.9.6 Post Accident Sampling System

Relief Request--The licensee requests relief from visually observing that the remote position indicators for the post accident sampling FSVs are accurately reflecting actual valve positions. The FSVs are totally enclosed solenoid valves, preventing visual determination of valve position. As alternate testing, the licensee proposes testing which will pressurize one side of the FSV and monitor pressure changes with FSV operation to verify remote indicators accurately reflect valve positions.

3.9.7 Essential Raw Cooling Water (ERCW) System

3.9.7.1 The following ERCW valves had power removed or control air isolated as a result of 10CFR50, Appendix R requirements. This changed the valve classification from Category B Active to Category B Passive for which there are no Section XI testing requirements. These valves are listed accordingly in Appendix E of the IST Pump and Valve Program.

Valve	*Existing Condition
0-FCV-67-12	1/2
0-FCV-67-14	1/2
1-FCV-67-81	2
2-FCV-67-81	2
1-FCV-67-82	2
2-FCV-67-82	2
1-FCV-67-127	2
2-FCV-67-127	2
1-FCV-67-128	2
2-FCV-67-128	2
1-FCV-67-147	3
2-FCV-67-147	2
0-FCV-67-151	3
1-FCV-67-168	4
2-FCV-67-168	4
1-FCV-67-170	4
2-FCV-67-170	4
1-FCV-67-188	4
2-FCV-67-188	4
1-FCV-67-190	4
2-FCV-67-190	4
1-FCV-67-223	2
2-FCV-67-223	2
0-FCV-67-364	1/2
0-FCV-67-365	1/2
1-FCV-67-424	3
1-FCV-67-478	2
1-FCV-67-489	2
2-FCV-67-489	2
1-FCV-67-492	2
2-FCV-67-492	2

*1 previously deleted AERCW
2 open with power removed
3 closed with power removed
4 open with control air isolated

3.9.7.2 The ERCW CVs in the suction and discharge lines to and from the diesel generators, 67-508A, -508B, -513A, -513B, -512A, -512B, -517A, -517B, were added to the Sequoyah IST valve program in accordance with IE Bulletin 83-03. These valves are full stroke exercised quarterly during the diesel tests and disassembled and inspected at least once every two years; the CVs in the alternate supply to the diesels are not full stroke exercised as they do not provide a required safety related function in the open position.

3.10 Miscellaneous Notes and Comments

3.10.1 The maximum allowable stroke times for category A and B power operated valves are included in the IST Program in the Sequoyah Units 1 and 2 Section XI program implementing procedures. The calculated maximum allowable stroke times and the maximum allowable stroke times shall not be <2.0 second due to the eye and hand coordination involved in manually operating a stop watch.

3.10.2 Valves FCV-1-17 and FCV-1-18, steam supply valves to the turbine driven (T-D) AFWP are correctly noted as main steam system valves. These valves were relocated in the IST valve listing, Appendix C, to the main steam section.

3.10.3 Both valves 3-895 and 3-894, CVs on the AFWP recirculation lines to the condensate storage tanks, are included in the IST program and have been tested heretofore in accordance with the requirements of Section XI.

3.10.4 A flow reducer is provided on the head vent system pipe which forms the boundary between Class 1 and 2 piping. This is indicated on drawing 47W813-1, RCS, by note 8 and on 47W811-2, UHI, by the symbol 'FR' defined by note 8 as a 3/8" flow restrictor.

3.10.5 Typographical errors in the SER were identified and interpreted as follows: 1) CV 0-82-502-1A1 was incorrectly identified as 0-83-502-1A1 in Appendix D, item 1, and 2) FSV-68-397 was incorrectly identified as FSV-68-937 in Appendix D, item 1.