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SAFETY EVALUATION REPORT, INSERVICE TESTING PROGRAM

VIRGIL C. SUMMER NUCLEAR STATION

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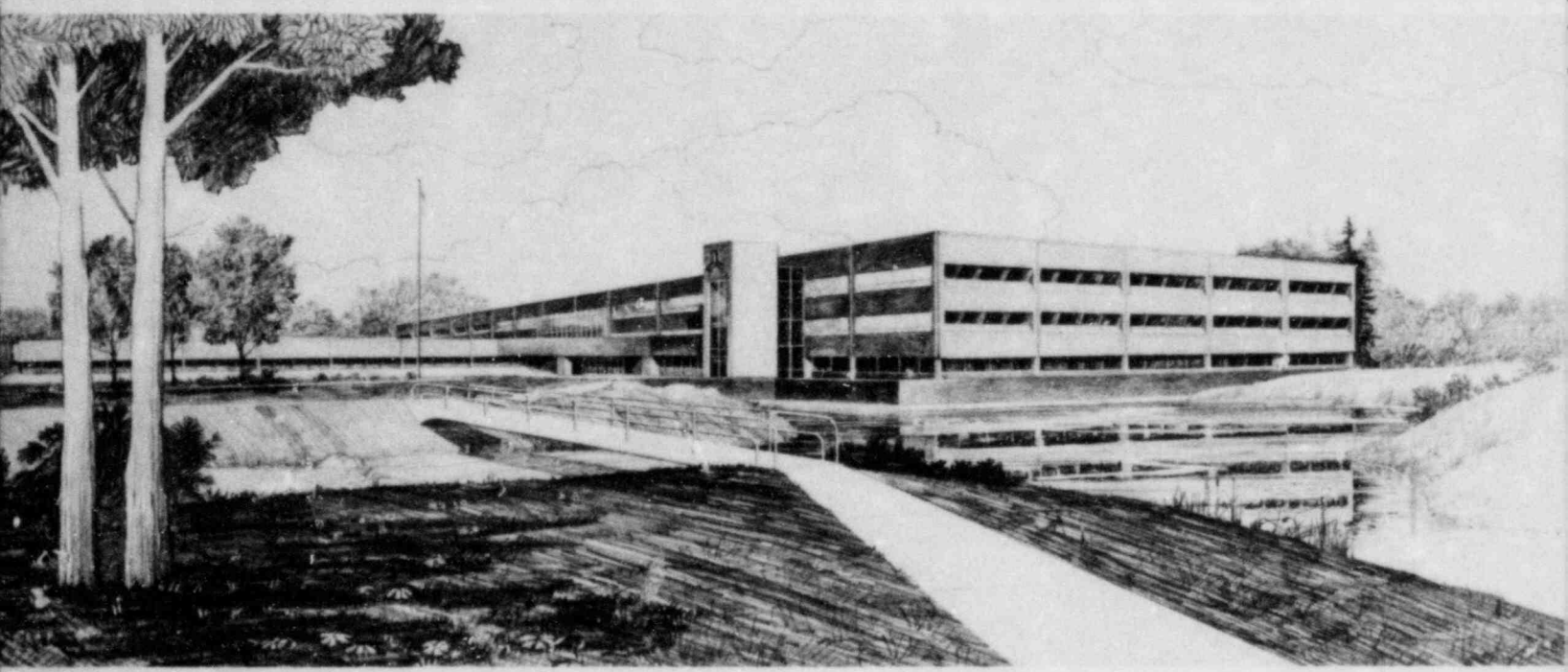

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VIRGIL C. SUMMER NUCLEAR STATION

October 1982

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EG&G Idaho, Inc.

Docket No. 50-395

ABSTRACT

This EG&G Idaho, Inc. report presents the results of our evaluation of the Virgil C. Summer Nuclear Station Inservice Testing Program for safety-related pumps and valves.

FOREWORD

This report is supplied as part of the "Review of Pump and Valve Inservice Testing Programs for Operating License Plants" being conducted for the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Division of Engineering, by EG&G Idaho, Inc., Reliability and Statistics Branch.

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1. INTRODUCTION

Contained herein is a safety evaluation of the pump and valve inservice testing (IST) program submitted by the South Carolina Electric and Gas Company (SCE&G) for its Virgil C. Summer Nuclear Station.

The working session with SCE&G and Virgil C. Summer Nuclear Station representatives was conducted on February 24 and 25, 1982. The licensee's valve resubmittal, dated March 30, 1982, was received by EG&G Idaho, Inc., on May 17, 1982, and reviewed to verify compliance of proposed tests of safety-related Class 1, 2, and 3 valves with requirements of the ASME Boiler and Pressure Vessel Code, Section XI, 1977 Edition, through the Summer of 1978 Addenda. The licensee's pump resubmittal, dated July 9, 1982, was received by EG&G Idaho, Inc., on August 24, 1982, and reviewed to verify compliance of proposed tests of safety-related Class 1, 2, and 3 pumps with requirements of the ASME Boiler and Pressure Vessel Code, Section XI, 1977 Edition, through the Summer of 1978 Addenda. SCE&G has also requested relief from the ASME Code testing requirements for specified pumps and valves because of practical reasons. These requests have been evaluated individually to determine whether they have significant risk implications and whether the tests, as required, are indeed impractical.

The evaluation of the pump and valve testing programs and associated relief requests are the recommendations of EG&G Idaho, Inc.

A summary of pump and valve testing requirements is provided in Appendix A.

A supplement to the Virgil C. Summer Nuclear Station Safety Evaluation Report (SER) that addresses testing of valves which perform a pressure isolation function is contained in Appendix B.

Valves that we feel should be reviewed by the NRC for compliance with Appendix J containment isolation criterion are listed in Attachment 1.

Category A, B, and C valves that meet the requirements of the ASME Code Section XI and are not exercised every three months are listed in Attachment 2.

A listing of P&IDs used for this review is contained in Attachment 3.

Valves that are never full-stroke exercised or that have a testing interval greater than each refueling outage, and relief requests with insufficient technical basis where relief is not recommended are summarized in Attachment 4. This attachment also contains a list of valves that are not included in the IST program, which we feel perform a safety-related function and should be included in the program.

Items discussed via telephone after the IST meeting with the licensee that result in changes to their program and may appear as differences between their IST program and this report are detailed in Attachment 5.

2. PUMP TESTING PROGRAM

The IST program submitted by Virgil C. Summer Nuclear Station was examined to verify that Class 1, 2, and 3 safety-related pumps were included in the program and that those pumps are subjected to the periodic tests as required by the ASME Code, Section XI. Our review found that all Class 1, 2, and 3 safety-related pumps were included in the IST program and, except for those pumps identified below for which specific relief from testing has been requested, the pump tests and frequency of testing comply with the Code. Each Virgil C. Summer Nuclear Station basis for requesting relief from testing pumps and the EG&G Idaho evaluation of that request is summarized below.

2.1 Diesel Generator Fuel Oil Transfer Pumps

2.1.1 Relief Request

The licensee has requested specific relief from the test requirement of measuring diesel generator fuel oil transfer pumps, XPP-141A & 141B and XPP-4A & 4B, bearing temperature, inlet pressure (Pi), differential pressure (dP), and vibration amplitude (V) in accordance with the requirements of Section XI and proposed to utilize pump flow (Q) to determine the pumps performance.

2.1.1.1 Code Requirement. Refer to Appendix A.

2.1.1.2 Licensee's Basis for Requesting Relief. Diesel generator fuel oil transfer pumps are positive displacement pumps and will be tested during the testing of the emergency diesel generators. Pi and dP cannot be measured on these pumps, since there are no Pi, dP, or outlet pressure (Po) instruments installed in the system. The pump bearings are sealed, so bearing temperature cannot be measured. Vibration measurements can only be taken on the pump casing or support, and these measurements in the past have fluctuated to such an extent that the pump mechanical condition has

not been able to be determined. Under these conditions, flow measurement is indicative of pump performance. Flow measurement will be taken when pumps are used to pump up the diesel fuel oil tank at least once each month.

2.1.1.3 Evaluation. The licensee has stated that there is no installed instrumentation to measure Pi or Po, therefore, dP cannot be measured. The licensee has proposed measuring Q, by observing the change in the diesel fuel oil storage tank per unit time, to determine pump performance. We feel that by measuring Q, the licensee will adequately determine the pumps hydraulic characteristics and, therefore, relief should be granted from the testing requirement of Section XI, IWP-3300, for Pi and dP measurement. The licensee has stated that the pump bearings are sealed and bearing temperature cannot be measured. We feel relief should be granted from the testing requirement of Section XI, IWP-3300, for bearing temperature measurement. The only parameters measured to determine pump mechanical characteristics are vibration and bearing temperature. Since the licensee has requested relief from measuring both of these parameters, we feel that the pump mechanical characteristics cannot be determined by the licensee. Therefore, we feel that relief should not be granted from the testing requirement of Section XI, IWP-3300, for vibration amplitude measurement.

2.1.1.4 Conclusion. We conclude that the licensee's proposal to measure pump Q only, and no other test parameters, will not provide sufficient information to adequately monitor pump degradation and will not meet the intent of the Section XI requirements. Based on the considerations discussed above, we conclude that the licensee should also measure vibration amplitude in addition to pump flow to give reasonable assurance of pump operability intended by the Code.

2.2 Service Water Booster Pumps

2.2.1 Relief Request

The licensee has requested specific relief from the test requirement of measuring service water booster pumps, XPP-45A and 45B, flow (Q) in accordance with the requirements of Section XI and proposed to utilize pump differential pressure (dP) to determine the pumps performance.

2.2.1.1 Code Requirement. Refer to Appendix A.

2.2.1.2 Licensee's Basis for Requesting Relief. Full flow test would be detrimental to water chemistry in Reactor Building Cooling Units. The installed flow element/transmitter is downstream of the recirculation line and would not be representative of total pump flow when the pump is tested by recirculation flow.

Pumps will be tested on recirculation, measuring pump dP utilizing pump suction and discharge pressure instrumentation. Pump dP is indicative of pump performance which satisfies the intent of Section XI.

2.2.1.3 Evaluation. We agree with the licensee's basis and, therefore, feel relief should be granted from the testing requirement of Section XI, IWP-3300, for the service water booster pumps, XPP-45A and 45B, flow measurement. The licensee has demonstrated that the installed flow instrumentation would not be representative of pump flow when the pumps are tested on recirculation. Pump dP is indicative of pump performance in a fixed resistance system (pump recirculation test loop); therefore, the intent of Section XI is satisfied.

2.2.1.4 Conclusions. We conclude that the licensee's proposal to measure pump dP and not flow should provide sufficient information to adequately monitor pump degradation and meet the intent of the Section XI requirements. Based on the considerations discussed above, we conclude

that the alternate testing proposed will give reasonable assurance of pump operability intended by the Code and that the relief thus granted will not endanger life or property or the common defense and security of the public.

2.3 Boric Acid Transfer Pumps

2.3.1 Relief Request

The licensee has requested specific relief from the test requirement of measuring boric acid transfer pumps, XPP-13A and 13B, flow (Q) in accordance with the requirements of Section XI and proposed to utilize pump dP to determine the pumps performance.

2.3.1.1 Code Requirement. Refer to Appendix A.

2.3.1.2 Licensee's Basis for Requesting Relief. There is no installed flow element in the system. Pumps will be tested by recirculating to their associated tank and measuring pump dP utilizing tank level as suction pressure. Pump dP is indicative of pump performance requirements of Section XI.

2.3.1.3 Evaluation. We agree with the licensee's basis and, therefore, feel relief should be granted from the testing requirement of Section XI, IWP-3300, for the boric acid transfer pumps, XPP-13A and 13B, flow measurement. The licensee has demonstrated that there is no installed instrumentation to measure flow. Pump dP is indicative of pump performance in a fixed resistance system (pump recirculation test loop); therefore, the intent of Section XI is satisfied.

2.3.1.4 Conclusion. We conclude that the licensee's proposal to measure pump dP and not flow should provide sufficient information to adequately monitor pump degradation and meet the intent of the Section XI requirements. Based on the considerations discussed above, we conclude that the alternate testing proposed will give reasonable assurance of pump operability intended by the Code and that the relief thus granted will not endanger life or property or the common defense and security of the public.

2.4 Charging Pumps

2.4.1 Relief Request

The licensee has requested specific relief from the test requirement of measuring charging pumps, XPP-43A, 43B, and 43C, flow (Q) in accordance with the requirements of Section XI and proposed to utilize pump dP to determine the pumps performance.

2.4.1.1 Code Requirement. Refer to Appendix A.

2.4.1.2 Licensee's Basis for Requesting Relief. The installed flow element/transmitter is downstream of the seal injection line and would not be representative of total pump flow.

Technical Specification 4.1.2.3.1 states, "the required charging pump shall be demonstrated OPERABLE by verifying, on recirculation flow, a differential pressure across the pump of greater than or equal to 2472 psig is developed."

This test is required to be performed at least once per 31 days except when the vessel head is removed, and thus is indicative of pump performance and satisfies the intent of the Section XI flow test.

2.4.1.3 Evaluation. We agree with the licensee's basis and, therefore, feel relief should be granted from the testing requirement of Section XI, IWP-3300, for the charging pumps, XPP-43A, 43B, and 43C, flow measurement. The licensee has demonstrated that the installed flow instrumentation would not be representative of total pump flow since it is downstream of the seal injection tap off. Pump dP is indicative of pump performance in a fixed resistance system (pump recirculation test loop); therefore, the intent of Section XI is satisfied.

2.4.1.4 Conclusion. We conclude that the licensee's proposal to measure pump dP and not flow should provide sufficient information to adequately monitor pump degradation and meet the intent of the Section XI

requirements. Based on the considerations discussed above, we conclude that the alternate testing proposed will give reasonable assurance of pump operability intended by the Code and that the relief thus granted will not endanger life or property or the common defense and security of the public.

3. VALVE TESTING PROGRAM EVALUATION

The IST program submitted by South Carolina Electric and Gas Company was examined to verify that Class 1, 2, and 3 safety-related valves were included in the program and that those valves are subjected to the periodic tests required by the ASME Code, Section XI, and the NRC positions and guidelines. Our review found that all Class 1, 2, and 3 safety-related valves, except as noted in Attachment 4, were included in the IST program and, except for those valves identified below for which specific relief from testing has been requested, the valve tests and frequency of testing comply with the code requirements and the NRC positions and guidelines listed in Section 3.1. Included in Appendix B is the NRC position and valve listing for the leak testing of valves that perform a pressure isolation function and a procedure for the licensee's use to incorporate these valves into the IST program. Each South Carolina Electric and Gas Company request for relief from testing valves, the Code requirement for testing, South Carolina Electric and Gas Company's basis for requesting relief, and the EG&G evaluation and conclusions of that request is summarized below and grouped according to each specific system.

3.1 General Considerations

3.1.1 Testing of Valves Which Perform a Pressure Isolation Function

Refer to Appendix B, SER Supplement for Virgil C. Summer Nuclear Station.

3.1.2 Stroke Testing of Check Valves

The NRC stated its position to the licensee that check valves whose safety function is to open are expected to be full-stroked. If only limited operation is possible (and it has been demonstrated by the licensee and agreed to by the NRC), the check valve shall be partial-stroked. Since disk position is not always observable, the NRC staff stated that verification of the plant's safety analysis design flow rate through the check valve would be an adequate demonstration of the full-stroke

requirement. Any flow rate less than design will be considered part-stroke exercising unless it can be shown that the check valve's disk position at the lower flow rate would be equivalent to or greater than the design flow rate through the valve. The licensee agreed to conduct flow tests to satisfy the above position.

3.1.3 Licensee Request for Relief to Test Valves at Cold Shutdowns

The Code permits valves to be tested at cold shutdowns where it is not practical to test during plant operation, and these valves are specifically identified by the licensee and are full-stroke exercised during cold shutdowns; therefore, the licensee is meeting the requirements of the ASME Code. Since the licensee is meeting the requirements of the ASME Code, it is not necessary to grant relief; however, during our review of the licensee's IST program, we have verified that it is not practical to exercise these valves during power operation and that we agree with the licensee's basis. It should be noted that the NRC differentiates, for valve testing purposes, between the cold shutdown mode and the refueling mode. That is, for testing purposes, the refueling mode is not considered as a cold shutdown.

3.1.4 Valve Testing at Cold Shutdowns

Inservice valve testing at cold shutdowns is acceptable when the following conditions are met:

1. It is understood that the licensee is to commence testing as soon as the cold shutdown condition is achieved but not later than 48 hours after shutdown, and continue until complete or the plant is ready to return to power.

2. Completion of all valve testing is not a prerequisite to return to power.

3. Any testing not completed at one cold shutdown should be performed during any subsequent cold shutdowns that may occur before refueling to meet the code-specified testing frequency.

For planned cold shutdowns, where the licensee will complete the testing of all the valves identified in his IST program for testing in the cold shutdown mode, exceptions to the 48 hours may be taken.

3.1.5 Category A Valve Leak Check Requirements for Containment Isolation Valves (CIVs)

All CIVs shall be classified as Category A valves. The Category A valve-leak-rate test requirements of IWV-3421 through IWV-3425 have been superseded by Appendix J requirements for CIVs. The NRC has conluded that the applicable leak-test procedures and requirements for CIVs are determined by 10 CFR 50, Appendix J. Relief from IWV-3421 through IWV-3425 for CIVs presents no safety problem since the intent of these sections is met by Appendix J requirements.

The licensee shall comply with IWV-3426 and IWV-3427 unless relief is requested from these paragraphs. It should be noted that this relief would only be applicable where a Type C, Appendix J leak test is performed. Based on the considerations discussed above, the NRC concludes that the alternate testing proposed will give reasonable assurance of valve operability intended by the Code and that the relief thus granted will not endanger life or property or the common defense and security of the public.

3.1.6 Application of Appendix J Testing to the IST Program

The Appendix J review for this plant is a completely separate review from the IST program review. However, the determinations made by that review are directly applicable to the IST program. Our review has determined that the current IST program as submitted by the licensee correctly reflects the NRC's interpretation of Section XI vis-a-vis Appendix J. The licensee has agreed that, should the Appendix J program be amended, they will amend their IST program accordingly.

3.1.7 Safety-Related Valves

This review was limited to safety-related valves. Safety-related valves are defined as those valves that are needed to mitigate the consequences of an accident and/or to shut down the reactor and to maintain the reactor in a shutdown condition. Valves in this category would typically include certain ASME Code Class 1, 2, and 3 valves and could include some non-code class valves. It should be noted that the licensee may have included non-safety-related valves in their IST program as a decision on the licensee's part to expand the scope of their program.

3.1.8 Pressurizer Power Operated Relief Valves

The NRC has adopted the position that the pressurizer power operated relief valves should be included in the IST program as Category B valves and tested to the requirements of Section XI. However, since the PORVs have shown a high probability of sticking open and are not needed for over pressure protection during power operation, the NRC has concluded that routine exercising during power operation is "not practical" and, therefore, not required by IWV-3412(a).

The PORVs' function during reactor startup and shutdown is to protect the reactor vessel and coolant system from low temperature-overpressurization conditions and should be exercised prior to initiation of system conditions for which vessel protection is needed.

The following test schedule is recommended:

1. Full stroke exercising should be performed during cooldown prior to achieving the water solid condition in the pressurizer and during cold shutdown prior to heat up

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

3. Fail safe actuation testing is permitted by the Code to be performed at each cold shutdown if the valves cannot be tested during power operation. This testing should be performed at each cold shutdown.

4. The PORV block valves should be included in the IST program, to provide protection should a PORV fail open, and tested quarterly per the Code.

3.2 Chemical and Volume Control System

3.2.1 Category C Valves

3.2.1.1 Relief Request. The licensee has requested specific relief from exercising Category C valves XVC-8481A, 8481B, and 8481C, charging pump discharge header check valves, in accordance with the requirements of Section XI and proposed to full-stroke exercise these valves during refueling outages.

3.2.1.1.1 Code Requirement--Refer to Appendix A.

3.2.1.1.2 Licensee's Basis for Requesting Relief--Exercising these valves during normal operations would require establishing full charging flow into the Reactor Coolant System (RCS) causing an overpressure condition and possible reactor trip. During cold shutdown, full charging flow would cause a pressure surge and exceed the maximum pressure for the low temperature of the RCS.

These valves will be partial-stroke exercised quarterly and full flow exercised each refueling shutdown when the vessel head is removed.

3.2.1.1.3 Evaluation--We agree with the licensee's basis and, therefore, feel that relief should be granted from the exercising requirements of Section XI for Category C valves XVC-8481A, 8481B, and 8481C. The licensee has demonstrated that these valves cannot be full-stroke exercised during power operation because this would require

establishing full charging flow to the RCS which could result in an overpressure condition and possible reactor trip. During cold shutdowns, full charging flow could result in a low temperature overpressurization of the RCS.

3.2.1.1.4 Conclusion--We conclude that partial-stroke exercising these valves quarterly during power operation and full-stroke exercising these valves during refueling outages when the reactor vessel head is removed should demonstrate proper valve operability. Based on the considerations discussed above, we conclude that the alternate testing proposed will give reasonable assurance of valve operability intended by the Code and that the relief thus granted will not endanger life or property or the common defense and security of the public.

3.3 Emergency Feedwater System

3.3.1 Category C Valves

3.3.1.1 Relief Request. The licensee has requested specific relief from exercising Category C valves XVC-1022A&B and XVC-1034A&B, check valves in service water supply lines to the suctions of the turbine and motor driven emergency feedwater pumps, in accordance with the requirements of Section XI and proposed to disassemble these valves to verify operability during refueling outages.

3.3.1.1.1 Code Requirement--Refer to Appendix A.

3.3.1.1.2 Licensee's Basis for Requesting Relief--Testing these valves during plant operations could introduce service water into the Emergency Feedwater System and eventually into the Steam Generators causing severe chemistry control problems. Testing these valves during cold shutdown would contaminate the Condensate Storage Tank. Partial stroke exercising these valves during normal operation would require isolating the applicable Emergency Feedwater pump which would be a violation of technical specifications.

These valves will be disassembled and inspected each refueling shutdown.

3.3.1.1.3 Evaluation--We agree with the licensee's basis and, therefore, feel that relief should be granted from the exercising requirements of Section XI for Category C valves XVC-1022A&B and XVC-1034A&B. The licensee has demonstrated that these valves cannot be exercised during power operation or cold shutdowns due to the possibility of introducing service water into the emergency feedwater system and eventually into the steam generators resulting in severe chemistry control problems. The only feasible method of verifying valve operability is by partial valve disassembly and inspection of the valve's internals. During cold shutdowns, there may not be sufficient time available to verify valve operability by disassembly.

3.3.1.1.4 Conclusion--We conclude that disassembly and inspection of the valves during refueling outages should demonstrate proper valve operability. Based on the considerations discussed above, we conclude that the alternate testing proposed will give reasonable assurance of valve operability intended by the Code and that the relief thus granted will not endanger life or property or the common defense and security of the public.

3.4 Safety Injection System

3.4.1 Category A Valves

3.4.1.1 Relief Request. The licensee has requested specific relief from exercising Category A valves XVG-8801A&B, boron injection tank outlet valves, in accordance with the requirements of Section XI and proposed to full-stroke exercise these valves during refueling outages.

3.4.1.1.1 Code Requirement--Refer to Appendix A.

3.4.1.1.2 Licensee's Basis for Requesting Relief--Testing these valves during normal operation could inject a high concentration of boric

acid into the high head safety injection (HHSI) lines and thus into the reactor coolant system (RCS) causing an inadvertent boration and plant shutdown. During cold shutdown, exercising these valves could cause migration of the high concentration boric acid into the HHSI lines, which are not heat traced, causing solidification and blockage of these lines.

These valves will be exercised each refueling shutdown with the HHSI check valves.

3.4.1.1.3 Evaluation--We agree with the licensee's basis and, therefore, feel that relief should be granted from the exercising requirements of Section XI for Category A valves XVG-8801A&B. The licensee has demonstrated that these valves cannot be exercised during power operation because this exercising could result in injection of a high concentration of boric acid into the RCS, which could result in an inadvertent boration and plant shutdown. Exercising these valves during cold shutdowns could result in a possible migration of the high concentration boric acid into the HHSI lines causing solidification and blockage of these lines, since they are not heat traced.

3.4.1.1.4 Conclusion--We conclude that full-stroke exercising these valves during refueling outages should demonstrate proper valve operability. Based on the condiderations discussed above, we conclude that the alternate testing proposed will give reasonable assurance of valve operability intended by the Code and that the relief thus granted will not endanger life or property or the common defense and security of the public.

3.4.1.2 Relief Request. The licensee has requested specific relief from exercising Category A valves XVG-8888A & B, RHR/LHSI cold leg isolation valves, quarterly during power operation and proposed to full-stroke exercise these valves during cold shutdowns.

3.4.1.2.1 Code Requirement--Refer to Appendix A.

3.4.1.2.2 Licensee's Basis for Requesting Relief--Testing these valves during normal plant operations would require isolating one of the RHR loops. This would violate the Technical Specification Requirement, requiring two independent Emergency Core Cooling Systems (ECCS) operable. These valves will be tested during cold shutdown when one loop of the RHR can be shutdown and tested.

3.4.1.2.3 Evaluation--We do not agree with the licensee's basis and, therefore, do not feel relief should be granted from exercising these valves quarterly during power operation. The licensee's technical specifications allow a period of 72 hours to restore an inoperable ECCS subsystem to an operable status, which will allow the licensee sufficient time to perform the required testing on these valves during power operation. We do not interpret the licensee's technical specification 3/4.5.2 to preclude testing of these valves quarterly during power operation.

3.4.1.2.4 Conclusion--We conclude that the licensee should full-stroke exercise these valves quarterly per the Code to demonstrate proper valve operability.

3.4.2 Category A/C Valves

3.4.2.1 Relief Request. The licensee has requested specific relief from exercising Category A/C valves XVC-8997A,B,&C, check valves from the discharge of the boron injection tank to the RCS cold legs, in accordance with the requirements of Section XI and proposed to full-stroke exercise these valves during refueling outages.

3.4.2.1.1 Code Requirement--Refer to Appendix A.

3.4.2.1.2 Licensee's Basis for Requesting Relief--Testing these valves during plant operation will require establishing charging flow through the Boron Injection Tank, not only placing unnecessary thermal stresses on the high head injection piping, but also diluting the boric

acid concentration in the Boron Injection Tank and causing an over boration of the RCS. Testing these valves during cold shutdown also requires establishing charging flow through the high head injection lines. With the RCS at such a low pressure and temperature, we would have an uncontrolled injection of a large volume of water which could cause a pressure spike in the system and exceed the pressure-temperature limits. These valves will be tested during each refueling when the vessel head is removed and the refueling pool can be used to contain the large volume of water.

3.4.2.1.3 Evaluation--We agree with the licensee's basis and, therefore, feel that relief should be granted from the exercising requirements of Section XI for Category A/C valves XVC-8997A,B,&C. The licensee has demonstrated that these valves cannot be exercised during power operation because the exercising would require injecting a high concentration of boric acid into the RCS, which would result in an over boration and cause plant shutdown. Full stroke exercising these check valves during cold shutdowns could result in a low temperature overpressurization of the RCS.

3.4.2.1.4 Conclusion--We conclude that full-stroke exercising these valves during refueling outages when the reactor vessel head is removed should demonstrate proper valve operability. Based on the considerations discussed above, we conclude that the alternate testing proposed will give reasonable assurance of valve operability intended by the Code and that the relief thus granted will not endanger life or property or the common defense and security of the public.

3.4.2.2 Relief Request. The licensee has requested specific relief from exercising Category A/C valves XVC-8995A,B,&C, HHSI system check valves to the RCS loop cold legs, in accordance with the requirements of Section XI and proposed to full-stroke exercise these valves during refueling outages.

3.4.2.2.1 Code Requirement--Refer to Appendix A.

3.4.2.2.2 Licensee's Basis for Requesting Relief--Testing these valves during plant operations requires establishing charging flow through

the cold leg recirculation lines placing unnecessary thermal stresses on the recirculation lines. Testing these valves during cold shutdown also requires establishing charging flow through the cold leg recirculation lines. With the RCS at such a low pressure and temperature, an uncontrolled injection of a large volume of water would occur which could cause a pressure spike in the system and exceed the pressure temperature limits.

These valves will be tested at each refueling when the vessel head is removed and the refueling pool can be used to contain the large volume of water.

3.4.2.2.3 Evaluation--We agree with the licensee's basis and, therefore, feel that relief should be granted from the exercising requirements of Section XI for Category A/C valves XVC-8995A,B,&C. The licensee has demonstrated that these valves cannot be exercised during power operation because charging flow would have to be established through the cold leg recirculation lines, which would cause unnecessary thermal stresses on these lines. These unnecessary thermal stresses could result in premature failure of the cold leg recirculation lines. During cold shutdowns, exercising these check valves with charging pump flow could result in a low temperature overpressurization of the RCS.

3.4.2.2.4 Conclusion--We conclude that full-stroke exercising these valves during refueling outages when the reactor vessel head is removed should demonstrate proper valve operability. Based on the considerations discussed above, we conclude that the alternate testing proposed will give reasonable assurance of valve operability intended by the Code and that the relief thus granted will not endanger life or property or the common defense and security of the public.

3.4.2.3 Relief Request. The licensee has requested specific relief from exercising Category A/C valves XVC-8990A,B,&C, HHSI hot leg loop header check valves, in accordance with the requirements of Section XI and proposed to full-stroke exercise these valves during refueling outages.

3.4.2.3.1 Code Requirement--Refer to Appendix A.

3.4.2.3.2 Licensee's Basis for Requesting Relief--Testing these valves during normal operations would require establishing charging flow through the hot leg recirculation lines, placing unnecessary thermal stresses on the recirculation lines. Testing these valves during cold shutdown also requires establishing charging flow through the hot leg recirculation lines. With the RCS at such a low pressure and temperature, an uncontrolled injection of a large volume of water would occur which could cause a pressure spike in the system and exceed the pressure temperature limits.

These valves will be tested at each refueling when the vessel head is removed and the refueling pool can be used to contain the large volume of water.

3.4.2.3.3 Evaluation--We agree with the licensee's basis and, therefore, feel that relief should be granted from the exercising requirements of Section XI for Category A/C valves XVC-8990A,B,&C. The licensee has demonstrated that these valves cannot be exercised during power operation because charging flow would have to be established through the hot leg recirculation lines, which would cause unnecessary thermal stresses on these lines. These unnecessary thermal stresses could result in premature failure of the hot leg recirculation lines. During cold shutdowns, exercising these check valves with charging pump flow could result in a low temperature overpressurization of the RCS.

3.4.2.3.4 Conclusion--We conclude that full-stroke exercising these valves during refueling outages when the reactor vessel head is removed should demonstrate proper valve operability. Based on the considerations discussed above, we conclude that the alternate testing proposed will give reasonable assurance of valve operability intended by the Code and that the relief thus granted will not endanger life or property or the common defense and security of the public.

3.4.2.4 Relief Request. The licensee has requested specific relief from exercising Category A/C valves XVC-8992A,B,&C, HHSI hot leg loop

header check valves, in accordance with the requirements of Section XI and proposed to full-stroke exercise these valves during refueling outages.

3.4.2.4.1 Code Requirement--Refer to Appendix A.

3.4.2.4.2 Licensee's Basis for Requesting Relief--Testing these valves during normal operations would require establishing charging flow through the hot leg recirculation lines, placing unnecessary thermal stresses on the recirculation lines. Testing these valves during cold shutdown also requires establishing charging flow through the hot leg recirculation lines. With the RCS at such a low pressure and temperature, an uncontrolled injection of a large volume of water would occur which could cause a pressure spike in the system and exceed the pressure temperature limits.

These valves will be tested at each refueling when the vessel head is removed and the refueling pool can be used to contain the large volumes of water.

3.4.2.4.3 Evaluation--We agree with the licensee's basis and, therefore, feel relief should be granted from the exercising requirements of Section XI for Category A/C valves XVC-8992A,B,&C. The licensee has demonstrated that these valves cannot be exercised during power operation because charging flow would have to be established through the hot leg recirculation lines, which would cause unnecessary thermal stresses on these lines. These unnecessary thermal stresses could result in premature failure of the hot leg recirculation lines. During cold shutdowns, exercising these check valves with charging pump flow could result in a low temperature overpressurization of the RCS.

3.4.2.4.4 Conclusion--We conclude that full-stroke exercising these valves during refueling outages when the reactor vessel head is removed should demonstrate proper valve operability. Based on the considerations discussed above, we conclude that the alternate testing

proposed will give reasonable assurance of valve operability intended by the Code and that the relief thus granted will not endanger life or property or the common defense and security of the public.

3.4.2.5 Relief Request. The license has requested specific relief from exercising Category A/C valves XVC-8948A,B,&C and XVC-8956A,B,&C, safety injection accumulators discharge check valves, in accordance with the requirements of Section XI and proposed to manually full-stroke exercise these valves during refueling outages.

3.4.2.5.1 Code Requirement--Refer to Appendix A.

3.4.2.5.2 Licensee's Basis for Requesting Relief--Testing these valves during plant operations would require initiating flow from the Safety Injection accumulator to the RCS. The Safety Injection accumulator does not have the required pressure to overcome normal RCS pressure; therefore, flow could not be established. During cold shutdown, the RCS would not have the volume to contain the large volume of water required to full-stroke exercise these valves; therefore, an overpressure condition for the low temperature would result. During refueling shutdown, exercising these valves with flow could damage the reactor internals due to the large volume of high pressure water injected.

These valves will be disassembled and inspected during each refueling shutdown.

3.4.2.5.3 Evaluation--We agree with the licensee's basis and, therefore, feel that relief should be granted from the exercising requirements of Section XI for Category A/C valves XVC-8948A, B, & C and XVC-8956A, B, & C. The licensee has demonstrated that these valves cannot be exercised during power operation because the Safety Injection accumulators do not have sufficient pressure to overcome normal RCS pressure. During cold shutdown, exercising these valves could result in a low temperature overpressurization of the RCS. During refueling shutdown, exercising these valves with flow could damage the reactor internals due to the large volume of high pressure water required to full-stroke exercise

them. Therefore, the only feasible method of verifying valve operability is by partial valve disassembly and inspection of the valve's internals. During cold shutdowns, there may not be sufficient time available to verify valve operability by disassembly.

3.4.2.5.4 Conclusion--We conclude that disassembly and inspection of the valve's internals during refueling outages should demonstrate proper valve operability. Based on the considerations discussed above, we conclude that the alternate testing proposed will give reasonable assurance of valve operability intended by the Code and that the relief thus granted will not endanger life or property or the common defense and security of the public.

3.4.2.6 Relief Request. The license has requested specific relief from exercising Category A/C valve XVC-8993C, HHSI hot leg loop "C" header check valve, in accordance with the requirements of Section XI and proposed to full-stroke exercise this valve during refueling outages.

3.4.2.6.1 Code Requirement--Refer to Appendix A.

3.4.2.6.2 Licensee's Basis for Requesting Relief--Testing this valve during normal plant operation would cause an inadvertant boration due to the high concentration of boric acid in the RWST, thus a plant shutdown. Also, during normal plant operation, establishing flow through this valve with the charging pumps would place unnecessary thermal stresses on the associated safety injection piping. During cold shutdown the RCS does not have the volume to contain the large volume of water required to test the valve and the maximum pressure for the low temperature would be exceeded.

Valve will be tested at the end of each refueling when the vessel head is removed and the refueling pool can be used to contain the large volume of water.

3.4.2.6.3 Evaluation--We agree with the licensee's basis and, therefore, feel relief should be granted from the exercising requirements

of Section XI for Category A/C valve XVC-8993C. The licensee has demonstrated that this valve cannot be exercised during power operation because charging flow would have to be established through the hot leg recirculation line, which would cause unnecessary thermal stresses on this line. The unnecessary thermal stress could result in premature failure of the hot leg recirculation line. During cold shutdowns, exercising this valve with charging pump flow could result in a low temperature overpressurization of the RCS.

3.4.2.6.4 Conclusion--We conclude that full-stroke exercising this valve during refueling outages when the reactor vessel head is removed should demonstrate proper valve operability. Based on the considerations discussed above, we conclude that the alternate testing proposed will give reasonable assurance of valve operability intended by the Code and that the relief thus granted will not endanger life or property or the common defense and security of the public.

3.4.3 Category B Valves

3.4.3.1 Relief Request. The licensee has requested specific relief from exercising Category B valves XVG-8809A & B, RHR/LHSI suction supply isolation valves from the refueling water storage tank (RWST), quarterly during power operation and proposed to full-stroke exercise these valves during cold shutdowns.

3.4.3.1.1 Code Requirement--Refer to Appendix A.

3.4.3.1.2 Licensee's Basis for Requesting Relief--Testing these valves during normal operation would isolate the RWST from the suction of the RHR pumps, violating Technical Specification Requirements, requiring two (2) Emergency Core Cooling Systems operable with flow path capable of taking suction from the refueling water storage tank on a safety injection signal. These valves will be tested during cold shutdown when one loop of the RHR can be shutdown and tested.

3.4.3.1.3 Evaluation--We do not agree with the licensee's basis and, therefore, do not feel relief should be granted from exercising these valves quarterly during power operation. The licensee's technical specifications allow a period of 72 hours to restore an inoperable ECCS subsystem to an operable status, which should allow the licensee sufficient time to perform the required testing on these valves during power operation. We do not interpret the licensee's technical specification 3/4.5.2 to preclude testing of these valves quarterly, during power operation.

3.4.3.1.4 Conclusion--We conclude that the licensee should full-stroke exercise these valves quarterly per the Code to demonstrate proper valve operability.

3.4.4 Category C Valves

3.4.4.1 Relief Request. The licensee has requested specific relief from exercising Category C valve XVC-8926, check valve in suction line from the refueling water storage tank (RWST) to the charging pumps, in accordance with the requirements of Section XI and proposed to full-stroke exercise this valve during refueling outages.

3.4.4.1.1 Code Requirement--Refer to Appendix A.

3.4.4.1.2 Licensee's Basis for Requesting Relief--Testing this valve during normal plant operations would cause an inadvertent boration due to the high concentration of boric acid in the RWST, thus a plant shutdown. During cold shutdown, the RCS does not have the volume to contain the large volume of water required to test the valve and the maximum pressure for the low temperature would be exceeded.

The valve will be tested at each refueling when the vessel head is removed and the refueling pool can be used to contain the large volume of water.

3.4.4.1.3 Evaluation--We agree with the licensee's basis and, therefore, feel that relief should be granted from the exercising requirements of Section XI for Category C valve XVC-8926. The licensee has demonstrated that exercising this valve during power operation would result in introducing water with a high concentration of boric acid into the RCS. The highly concentrated boric acid from the RWST could result in an inadvertent boration of the RCS and a plant shutdown. During cold shutdowns exercising this valve could result in a low temperature overpressurization of the RCS.

3.4.4.1.4 Conclusion--We conclude that the proposed alternate testing of full-stroke exercising this valve during refueling outages, when the reactor vessel head is removed, should demonstrate proper valve operability. Based on the considerations discussed above, we conclude that the alternate testing proposed will give reasonable assurance of valve operability intended by the Code and that the relief thus granted will not endanger life or property or the common defense and security of the public.

3.5 Reactor Building Spray System

3.5.1 Category A/C Valves

3.5.1.1 Relief Request. The licensee has requested specific relief from exercising Category A/C valves XVC-3009A&B, reactor building spray header inside containment isolation check valves, in accordance with the requirements of Section XI and proposed to manually full-stroke exercise these valves during refueling outages.

3.5.1.1.1 Code Requirement--Refer to Appendix A.

3.5.1.1.2 Licensee's Basis for Requesting Relief--Testing these valves during plant operation would require placing the Reactor Building Spray System in operation which would result in dousing the containment and filters. Valves will be disassembled and inspected during each refueling shutdown.

3.5.1.1.3 Evaluation--We agree with the licensee's basis and, therefore, feel that relief should be granted from the exercising requirements of Section XI for Category A/C valves XVC-3009A & B. The licensee has demonstrated that exercising these valves with flow during power operation or cold shutdowns would result in spraying the containment and filters. Spraying containment could result in damage to lagging, electrical equipment, etc. The only feasible method of verifying valve operability is by partial valve disassembly and inspection of the valve's internals. During cold shutdowns, there may not be sufficient time available to verify valve operability by disassembly.

3.5.1.1.4 Conclusion--We conclude that disassembly and inspection of the valve's internals during refueling outages should demonstrate proper valve operability. Based on the considerations discussed above, we conclude that the alternate testing proposed will give reasonable assurance of valve operability intended by the Code and that the relief thus granted will not endanger life or property or the common defense and security of the public.

3.5.2 Category C Valves

3.5.2.1 Relief Request. The licensee has requested specific relief from exercising Category C valves XVC-3013A & B, reactor building spray system sodium hydroxide storage tank discharge header check valves, in accordance with the requirements of Section XI and proposed to manually full-stroke exercise these valves during refueling outages.

3.5.2.1.1 Code Requirement--Refer to Appendix A.

3.5.2.1.2 Licensee's Basis for Requesting Relief--Exercising these valves during power operation or cold shutdown would require injecting sodium hydroxide into the refueling water storage tank. These valves will be disassembled and inspected during each refueling outage.

3.5.2.1.3 Evaluation--We agree with the licensee's basis and, therefore, feel that relief should be granted from the exercising

requirements of Section XI for Category C valves XVC-3013A & B. Exercising these valves with flow during any plant mode would require either spraying the containment or injecting highly corrosive sodium hydroxide into the refueling water storage tank via the reactor building spray system full flow pump test loop. Therefore, the only feasible method of verifying valve operability is by partial valve disassembly and inspection of the valve's internals. During cold shutdowns, there may not be sufficient time available to verify valve operability by disassembly.

3.5.2.1.4 Conclusion--We conclude that disassembly and inspection of the valve's internals during refueling outages should demonstrate proper valve operability. Based on the considerations discussed above, we conclude that the alternate testing proposed will give reasonable assurance of valve operability intended by the Code and that the relief thus granted will not endanger life or property or the common defense and security of the public.

APPENDIX A

APPENDIX A

1. CODE REQUIREMENT--VALVES

Subsection IWV-3411 of the 1977 Edition of the Section XI ASME Code (which discusses full-stroke and partial-stroke requirements) requires that Code Category A and B valves be exercised once every three months, with exceptions as defined in IWV-3412(a), IWV-3415, and IWV-3416. IWV-3521 (which discusses full-stroke and partial-stroke requirements) requires that Code Category C valves be exercised once every three months, with exceptions as defined in IWV-3522. In the above exceptions, the Code permits the valves to be tested at cold shutdown where:

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

2. It is not practical to observe the operation of the valves (with failsafe actuators) upon loss of actuator power.

Subsection IWV-3413 requires all Category A and B power-operated valves to be stroke-time tested to the nearest second or 10% of the maximum allowable owner-specified time.

2. CODE REQUIREMENTS--PUMPS

An inservice test shall be conducted on all safety-related pumps, nominally once each month during normal plant operation. Each inservice test shall include the measurement, observation, and recording of all quantities in Table IWP-3100-1, except bearing temperature, which shall be measured during at least one inservice test each year.

APPENDIX B

APPENDIX B

1. SER SUPPLEMENT FOR VIRGIL C. SUMMER NUCLEAR STATION

1.1 Testing of Valves which Perform a Pressure Isolation Function

This SER supplement addresses all pressure boundary isolation valves and their classification at the Virgil C. Summer Nuclear Station. Reference: J. P. Knight memorandum to R. L. Tedesco, January 28, 1981.

1.1.1 SER Supplement

PERIODIC LEAK TESTING OF PRESSURE ISOLATION VALVES

There are several safety systems connected to the reactor coolant pressure boundary that have a design pressure below the rated reactor coolant system (RCS) pressure. There are also some systems which are rated at full reactor pressure on the discharge side of pumps but have pump suction below RCS pressure. In order to protect these systems from RCS pressure, two or more isolation valves are placed in series to form the interface between the high pressure RCS and the low pressure systems. The leak tight integrity of these valves must be ensured by periodic leak testing to prevent exceeding the design pressure of the low pressure systems thus causing an inter-system LOCA. Periodic leak testing of pressure isolation valves shall be performed after all disturbances to the valve are complete. The pressure isolation valves to be tested are listed in the technical specifications.

The applicant has agreed to categorize their pressure isolation valves for the safety injection, residual heat removal, and boron injection systems, as Category A or AC. These categorizations meet our requirements and we find them acceptable. Pressure isolation valves are required to be Category A or AC and to meet the appropriate valve leak-rate test requirements of IWV-3420 of Section XI of the ASME Code except as discussed below. The allowable leakage rate shall not exceed 1.0 gallon per minute (GPM) for each valve as stated in the technical specifications.

The applicant has committed to test all pressure isolation valves to the 1.0 GPM leak-rate criteria.

SCE&G will leak test the residual heat removal (RHR) suction and low head safety injection (LHSI) to the cold legs pressure isolation valves (two check valves or two MOVs for each) once per refueling but not after seat disturbances due to flow. As an alternative, so as to reduce the probability of an intersystem LOCA from occurring in the LHSI to the cold legs, the applicant has proposed to leak test a third check valve in each line (located inside the containment). We find this acceptable provided the applicant leak tests these valves once each refueling and as described above.

The applicant has also proposed to test the RHR pressure isolation valves once per refueling as described above. The staff finds this acceptable for the following reasons: (1) Full closure of these valves is verified in the control room by direct monitoring position indicators, (2) inadvertent opening of these valves is prevented through interlocks which require the plant to be below RHR operating pressure prior to opening, and (3) gross leakages due to valve failure would be detected by increasing levels in the pressurizer relief tank. Therefore, full closure of these valves is assured after opening, inadvertent opening is prevented and gross RCS leakages can be readily detected.

Limiting Conditions for Operation (LCO) will be added to the technical specifications which will require corrective action i.e., shutdown or system isolation when the leakage limits are not met. Also surveillance requirements, which will state the acceptable leak-rate testing frequency, will be provided in the technical specifications.

We conclude that SCE&G commitments to periodic leak testing of pressure isolation valves between the reactor coolant system and low pressure systems will provide reasonable assurance that the design pressure of the low pressure systems will not be exceeded, and thus reduce the

probability of an occurrence of an inter-system LOCA. Criterion 55 of the General Design Criteria of Appendix A of 10CFR50 partially considers this matter.

(End of Supplement)

Page 2 of 3 of Attachment V of V. C. Summer's IST program identifies all valves that perform a pressure isolation function. These valves are:

XVC-8993 A,B,C	XVC-8998 A,B,C
XVC-8992 A,B,C	XVC-8973 A,B,C
XVC-8990 A,B,C	XVC-8948 A,B,C
XVC-8988 A,B	XVC-8956 A,B,C
XVC-8997 A,B,C	XVG-8701 A,B
XVC-8995 A,B,C	XVG-8702 A,B
XVC-8974 A,B	

Our review has verified that these valves have been included in the IST program and categorized A or A/C.

ATTACHMENT 1

ATTACHMENT 1

During the course of our review of the V. C. Summer Nuclear Station IST program, we found the following valves that we feel should be reviewed by the NRC to determine if these valves meet the Appendix J criterion for containment isolation. If any of these valves are determined to be containment isolation valves requiring Appendix J leak-rate testing, then they should be included in the IST program and categorized A or A/C as applicable.

Safety Injection System:	XVG-8812A,B
Feedwater System:	XVK-1633A,B,C
Reactor Building Spray System:	XVG-3005A,B
Chemical and Volume Control System:	XVT-8102A,B,C
	XVC-8368A,B,C
Nuclear Sampling System:	9386A,B,C

ATTACHMENT 2

ATTACHMENT 2

The following are Category A,B, and C valves that meet the exercising requirements of the ASME Code, Section XI, and are not full-stroke exercised every three months during plant operation. These valves are specifically identified by the owner and are full-stroke exercised during cold shutdowns and refueling outages. EG&G has reviewed all valves in this attachment and agrees with the licensee that testing these valves during power operation is not possible, due to the valve type and location or system design. We feel that these valves should not be exercised during power operation. These valves are listed below and grouped according to the system in which they are located.

1. COMPONENT COOLING WATER SYSTEM

1.1 Category A and A/C Valves

Category A/C valve XVC-9570, inside containment isolation check valve for component cooling water supply, cannot be exercised during power operation. Verifying closure of this valve, the safety-related position, during power operation would require securing cooling water to the reactor coolant pumps. During plant operation, this could damage the reactor coolant pumps and possibly result in a plant trip. This valve will be full-stroke exercised during cold shutdowns and refueling outages.

Category A/C valve XVC-9602, inside containment isolation check valve for component cooling water supply from the component cooling water booster pumps, cannot be exercised during power operation. Verifying closure of this valve, the safety-related position, during power operation would require securing cooling water to the reactor coolant pumps. During plant operation this could damage the reactor coolant pumps and possibly result in a plant trip. This valve will be full-stroke exercised during cold shutdowns and refueling outages.

Category A valve XVG-9600, outside containment isolation valve for component cooling water supply from the component cooling water booster pumps, cannot be exercised during power operation. Exercising this valve during power operation would require securing cooling water to the reactor coolant pumps, which could result in damage to the pumps and a possible plant trip. This valve will be full-stroke exercised during cold shutdowns and refueling outages.

Category A valve XVG-9568, outside containment isolation valve for component cooling water supply, cannot be exercised during power operation. Exercising this valve during power operation would require securing cooling water to the reactor coolant pumps, which could result in damage to the pumps and a possible plant trip. This valve will be full-stroke exercised during cold shutdowns and refueling outages.

Category A valves XVG-9605 and 9606, inside and outside containment isolation valves for component cooling water return, cannot be exercised during power operation. Exercising these valves during power operation would require securing cooling water to the reactor coolant pumps, which could result in damage to the pumps and a possible plant trip. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

2. CHEMICAL AND VOLUME CONTROL SYSTEM

2.1 Category A and A/C Valves

Category A/C valve XVC-8381, containment isolation check valve for normal charging, cannot be exercised during power operation. Exercising this check valve during normal plant operations would require securing charging and letdown flow, which could result in a loss of volume control and pressurizer level causing a reactor trip. This valve will be full-stroke exercised during cold shutdowns and refueling outages.

Category A valves XVG-8107 and 8108, charging header containment isolation valves, cannot be exercised during power operation. Exercising

these valves during normal plant operations would require securing charging and letdown flow, which could result in a loss of volume control and pressurizer level causing a reactor trip. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

Category A valve XVT-8152, letdown flow containment isolation valve, cannot be exercised during power operation. Exercising this valve during normal plant operation would isolate letdown which could cause thermal shock to the regenerative heat exchanger upon re-establishing letdown flow. This valve will be full-stroke exercised during cold shutdowns and refueling outages.

2.2 Category B Valves

Category B valves LCV-115C and 115E, volume control tank outlet header isolation valves, cannot be exercised during power operation. Exercising these valves during normal plant operations would require shifting charging pump suction from the volume control tank to the refueling water storage tank. This would cause an over boration of the RCS and could result in plant shutdown. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

2.3 Category C Valves

Category C valve XVC-8442, emergency borate check valve, cannot be exercised during power operation. Exercising this valve during normal plant operation would inject high concentrated boric acid into the suction of the charging pump causing an over boration of the RCS and could result in plant shutdown. This valve will be full-stroke exercised during cold shutdowns and refueling outages.

3. EMERGENCY FEEDWATER SYSTEM

3.1 Category B Valves

Category B valves XVG-1001A&B, isolation valves in the service water supply to the motor driven auxiliary feedwater pumps, cannot be exercised

during power operation. Exercising these valves during normal plant operations could introduce service water into the emergency feedwater pump suction lines and possibly into the steam generators. If service water was introduced into the steam generators, chemistry control problems would result (i.e., introduction of chlorides, which could result in steam generator mechanical damage). These valves will be full-stroke exercised during cold shutdowns and refueling outages, when the emergency feedwater piping can be flushed.

Category B valves XVG-1002 and 1008, isolation valves in the service water supply to the turbine driven auxiliary feedwater pump, cannot be exercised during power operation. Exercising these valves during normal plant operations could introduce service water into the emergency feedwater pump suction lines and possibly into the steam generators. If service water was introduced into the steam generators, chemistry control problems would result (i.e., introduction of chlorides, which could result in steam generator mechanical damage). These valves will be full-stroke exercised during cold shutdowns and refueling outages, when the emergency feedwater piping can be flushed.

Category B valves XVG-1037A&B, isolation valves between service water and emergency feedwater systems, cannot be exercised during power operation. Exercising these valves during normal plant operations could introduce service water into the emergency feedwater pump suction lines and possibly into the steam generators. If service water was introduced into the steam generators, chemistry control problems would result (i.e., introduction of chlorides, which could result in steam generator mechanical damage). These valves will be full-stroke exercised during cold shutdowns and refueling outages, when the emergency feedwater piping can be flushed.

3.2 Category C Valves

Category C valves XVC-1038A,B,&C and XVC-1039A,B,&C, emergency feedwater line check valves to the steam generators, cannot be exercised during power operation. Exercising these check valves during normal plant operation would introduce cold auxiliary feedwater to the steam generators,

inducing unnecessary thermal stress on the emergency feedwater piping and nozzles. These unnecessary thermal stresses could result in premature failure of the associated emergency feedwater piping and nozzles. These check valves will be full-stroke exercised during cold shutdowns and refueling outages.

Category C valves XVC-1015A&B, motor driven emergency feedwater pump discharge check valves, cannot be exercised during power operation. Exercising these check valves during normal plant operations would require establishing emergency feedwater flow to the associated steam generators, placing unnecessary thermal stress on the emergency feedwater piping and nozzles. This unnecessary thermal stress could result in premature failure of the associated emergency feedwater piping and nozzles. These check valves will be full-stroke exercised during cold shutdowns and refueling outages.

Category C valve XVC-1016, turbine driven emergency feedwater pump discharge check valve, cannot be exercised during power operation. Exercising this check valve during normal plant operations would require establishing emergency feedwater flow to a steam generator, placing unnecessary thermal stress on the emergency feedwater piping and nozzles. This unnecessary thermal stress could result in premature failure of the associated emergency feedwater piping and nozzles. These check valves will be full-stroke exercised during cold shutdowns and refueling outages.

Category C valves XVC-1013A&B and XVC-1014, motor driven and turbine driven emergency feedwater pump suction check valves, cannot be full-stroke exercised during power operation. Full stroke exercising these check valves during normal plant operations would require establishing emergency feedwater flow to the steam generators, placing unnecessary thermal stress on the emergency feedwater piping and nozzles. This unnecessary thermal stress could result in premature failure of the associated emergency feedwater piping and nozzles. These check valves will be partial-stroke exercised quarterly during the emergency feedwater pump tests and full-stroke exercised during cold shutdowns and refueling outages when the plant is being shut down from minimum load to cold shutdown.

Category C valves XVC-1019A,B,&C and XVC-1020A,B,&C, emergency feedwater line check valves, cannot be exercised during power operation. Exercising these check valves during normal plant operations would require establishing emergency feedwater flow to the steam generators, placing unnecessary thermal stress on the emergency feedwater piping and nozzles. Establishing emergency feedwater flow to the steam generators could cause steam generator level control problems and a possible reactor trip. These check valves will be full-stroke exercised during cold shutdowns and refueling outages while shutting down for minimum load to cold shutdown.

4. MAIN FEEDWATER SYSTEM

4.1 Category B Valves

Category B valves XVG-1611A,B,&C, main feedwater isolation valves, cannot be exercised during power operation. Exercising these valves during normal plant operations would isolate main feedwater to the associated steam generators, which could result in a reactor trip. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

5. INSTRUMENT AIR SYSTEM

5.1 Category A/C Valves

Category A/C valve XVC-2661, instrument air line inside containment isolation check valve, cannot be exercised during power operation. Exercising this valve during normal plant operations would require entry into the Reactor Building. During plant operation this could cause overexposure to the test personnel. This valve will be verified closed, its safety-related position, during cold shutdowns and refueling outages.

6. MAIN STEAM SYSTEM

6.1 Category B Valves

Category B valves XVG-2801A,B,&C, main steam line isolation valves, cannot be full-stroke exercised during power operation. Full stroke exercising any of these valves during normal plant operations would isolate the associated steam generator from the main steam line header which would result in a reactor trip. These valves will be partial-stroke exercised quarterly using Surveillance Test Procedure 121.002 and full-stroke exercised during cold shutdowns and refueling outages.

7. SAFETY INJECTION SYSTEM

7.1 Category A and A/C Valves

Category A/C valves XVC-8998A,B,&C, low head safety injection (LHSI) system/residual heat removal (RHR) system cold leg to loop check valves, cannot be exercised during power operation. Partial stroke exercising these check valves, using the charging pumps, would place unnecessary thermal stresses on the associated cold leg recirculation lines, which could result in premature failure of these lines. Full stroke exercising these check valves during normal operation would require establishing flow from the LHSI/RHR system. The LHSI/RHR pumps do not develop sufficient head to overcome reactor coolant system pressure during power operation. These check valves will be full-stroke exercised during cold shutdowns and refueling outages.

Category A/C valves XVC-8988A&B, RHR/LHSI system supply hot leg to loop check valves, cannot be exercised during power operations. Exercising these valves during normal plant operations would require initiating flow, using the RHR/LHSI pumps, into the reactor coolant system. Reactor coolant system pressure is higher than RHR/LHSI pump discharge pressure precluding flow into the reactor coolant system. These check valves will be full-stroke exercised during cold shutdowns and refueling outages.

Category A/C valves XVC-8993A&B, high head safety injection (HHSI) system hot leg to loop check valves, cannot be exercised during power operation. Partial stroke exercising these valves, using the charging pumps, would place unnecessary thermal stresses on the associated hot leg recirculation lines, which could cause premature failure of these lines. Full stroke exercising these valves during normal operation would require establishing flow from the RHR/LHSI system into the reactor coolant system. The RHR/LHSI pumps do not develop sufficient head to overcome reactor coolant system pressure and establish flow. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

Category A/C valves XVC-8974A&B and XVC-8973A,B,&C, RHR/LHSI system check valves to the cold legs, cannot be exercised during power operations. Exercising these valves during normal plant operations would require initiating flow, using the RHR/LHSI pumps, into the reactor coolant system. Reactor coolant system pressure is higher than RHR/LHSI pump discharge pressure precluding flow into the reactor coolant system. These check valves will be full-stroke exercised during cold shutdowns and refueling outages.

Category A valves XVG-8884, 8885, and 8886, HHSI hot and cold leg injection isolation valves, cannot be exercised during power operation. Exercising these valves during normal plant operations would place charging flow through the HHSI lines placing unnecessary thermal stresses on the safety injection piping. The thermal stresses on these lines could result in premature failure. During power operations, the charging system cannot be secured since this could result in loss of volume control and pressurizer level and also a loss of reactor coolant pump seal water which could result in a reactor trip. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

7.2 Category B Valves

Category B valves XVG-8808A,B,&C, safety injection accumulator outlet isolation valves, cannot be exercised during power operations. These valves are normally open during power operation and are required to be open

to mitigate the consequences of an accident. The plant's technical specifications require these valves to remain open during normal plant operation. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

Category B valves XVG-8803A&B, boron injection tank inlet isolation valves, cannot be exercised during power operations. Exercising these valves during normal plant operations could dilute the boron injection tank below the minimum concentration required by Technical Specifications. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

8. REACTOR BUILDING SPRAY SYSTEM

8.1 Category B Valves

Category B valves XVG-3002A&B, isolation valves for the suction of the reactor building spray pumps from the sodium hydroxide (NaOH) storage tank, cannot be exercised during power operation. Exercising these valves during normal plant operation would require isolating the common discharge line from the NaOH tank to these valves. This would violate the plant's technical specifications by having no NaOH available to the reactor building spray system if an accident occurred. These valves will be full-stroke exercised during cold shutdowns and refueling outages when the piping downstream can be flushed after exercising.

9. SERVICE WATER SYSTEM

9.1 Category B Valves

Category B valves XVG-3107A&B, isolation valves between the service water system and the industrial cooling water system, cannot be exercised during power operation. Exercising these valves during normal plant operations would cause service water to mix with the industrial cooling

water, causing a problem with the chemistry control of the industrial cooling water system. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

10. CONTROL ROD DRIVE MECHANISM (CRDM) COOLING WATER SYSTEM

10.1 Category A Valves

Category A valves XVG-7501, 7502, 7503, and 7504, inlet and outlet containment isolation valves for the CRDM coolers, cannot be exercised during power operation. Failure of any of these valves in the closed position during plant operation could result in overheating of the CRDMs and possible plant trip. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

11. VENTILATION SYSTEM

11.1 Category A Valves

Category A valves XVB-0001A&B and XVB-0002A&B, reactor building purge supply and exhaust containment isolation valves, cannot be exercised during power operation. These valves are locked closed and required by technical specifications to remain closed, to maintain containment integrity, during normal plant operations. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

ATTACHMENT 3

ATTACHMENT 3

The P&IDs listed below were used during the course of this review.

System	P&ID	Revision
CRDM Cooling Water	D-302-852	
Reactor Building Purge Supply and Purge Exhaust	D-912-103	12
Steam Generator Blowdown	D-302-781	7
Component Cooling	D-302-611	6
	D-302-612	9
	D-302-613	
Chemical and Volume Control	114E073 Sh. 1	
	114E073 Sh. 3	
	114E073 Sh. 5	
Diesel Generator	D-302-351	4
Feedwater	D-302-083	13
Emergency Feedwater	D-302-085	9
Fire Service	D-302-231	
Post Accident Hydrogen Removal	D-302-861	13
Instrument Air	D-302-273	4
Main Steam	D-302-011	10
Reactor and Auxiliary Building Sump Pumps	D-302-821	9
Reactor Coolant	114E072 Sh. 1	
	114E072 Sh. 2	
Residual Heat Removal	114E074	
Safety Injection	114E075 Sh. 1	
	114E075 Sh. 2	
	114E075 Sh. 3	
Reactor Building Spray	D-302-661	11
Nuclear Sampling	D-302-771	5
	D-302-772	
Service Water	D-302-221	6
	D-302-222	12

System	P&ID	Revision
Chilled Water	D-302-841	7
	D-302-842	6
	D-302-843	5
Waste Processing	114E077 Sh. 1	
Nitrogen Blanketing	D-302-311	3
Station Service Air	D-302-241	10

ATTACHMENT 4

ATTACHMENT 4

This attachment addresses valve that are not included in V. C. Summer's IST program, which we feel should be included because they perform a safety-related function. Also included is a list of relief requests where insufficient technical basis is provided and relief is not recommended.

1. We feel valves 8887A&B, RHR/LHSI discharge cross connect isolation valves, do perform a safety-related function and should be included in the IST program. The licensee is reviewing these valves to determine if they should be included in the IST program, but has not voluntarily agreed to include them in the program at the time that the SER was written.

2. The following relief requests have insufficient technical basis, and relief is not recommended.

   a. 2.1.1

   b. 3.4.1.2

   c. 3.4.3.1

ATTACHMENT 5

ATTACHMENT 5

The following items were discussed via telephone with the licensee (Nancy Clark) on September 13 and 17, 1982, and the licensee agreed to modify their IST program to reflect these changes:

1. Valve XVR-8117 will be changed to a category A/C valve in the IST program. This valve will be identified as a passive valve which does not require exercising.

2. The entry for valve XVX-9387 in the IST program will be deleted, since this is a duplication of the entry for valve XVM-9387 in another section of the IST program.

3. Valves XVC-6588 and XVX-6587, nitrogen blanketing system containment isolation valves, will be included in the IST program as A/C and A passive valves with no exercising required.

4. Valves 8940A & B, boron injection recirculation pumps discharge check valves, will be included in the IST program and exercised quarterly per the Code.

5. The exercising frequency for the power operated relief valves will be changed to cold shutdown to comply with the current NRC position.

6. The reactor head vent valves will be changed to category B in the IST program and exercised quarterly per the Code.

7. Relief request J.8 will be modified to reflect the contents of Section 3.4.2.5 of this report.

8. For valves XVC-3009A & B, relif request K.1 will be modified to reflect the contents of Section 3.5.1.1 of this report. Valves XVC-3013A & B will be removed from relief request K.1. The licensee will submit a new relief request for these valves which will reflect the contents of Section 3.5.2.1 of this report.

9. Relief request J.15 will be modified to reflect the contents of Section 3.4.2.6 of this report.

10. Relief request A.1, for the diesel fuel oil transfer pumps, will be modified to reflect the contents of Section 2.1.1 of this report.