TECHNICAL EVALUATION REPORT
PUMP AND VALVE INSERVICE TESTING PROGRAM
DONALD C. COOK NUCLEAR PLANT
UNITS 1 & 2

Docket No. 50-315 & 50-316

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ABSTRACT

This EG&G Idaho, Inc., report presents the results of our evaluation of the Donald C. Cook Nuclear Plant Inservice Testing Program for pumps and valves whose function is safety related.

PREFACE

This report is supplied as part of the "Review of Pump and Valve Inservice Testing Programs for Operating Plants (III)" Program being conducted for the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Mechanical Engineering Branch, by EG&G Idaho, Inc., Regulatory and Technical Assistance.

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1. INTRODUCTION

Contained herein is a technical evaluation of the pump and valve inservice testing (IST) program submitted by Indiana and Michigan Electric Company for its Donald C. Cook Nuclear Plant, Units 1 and 2.

The working session with Indiana and Michigan Electric Company representatives was conducted on July 14 and 15, 1987. The licensee's pump IST program, Revision 1, and valve IST program, Revision 2, dated October 5, 1987 was reviewed to verify compliance of proposed tests of pumps and valves whose function is safety-related with the requirements of the ASME Boiler and Pressure Vessel Code (the Code), Section XI, 1983 Edition through Summer 1983 Addenda. Any IST program revisions subsequent to those noted above are not addressed in this technical evaluation report (TER). The NRC staff position is that required program changes, such as additional relief requests or the deletion of any components from the IST Program, should be submitted to the NRC under separate cover in order to receive prompt attention, but should not be implemented prior to review and approval by the NRC.

In their IST program, Indiana and Michigan Electric Company has requested relief from the ASME Code testing requirements for specific pumps and valves and these requests have been evaluated individually to determine if the criteria in 10 CFR 50.55a for granting relief is indeed met. This review was performed utilizing the acceptance criteria of the Standard Review Plan, Section 3.9.6, and the Draft Regulatory Guide and Value/Impact Statement titled "Identification of Valves for Inclusion in Inservice Testing Programs." The IST Program testing requirements apply only to component testing (i.e., pumps and valves) and are not intended to provide the basis to change the licensee's current Technical Specifications for system test requirements.

Section 2 of this report presents the scope of this review.

Section 3 of this report presents the Indiana and Michigan Electric Company bases for requesting relief from the Section XI requirements for the Donald C. Cook Nuclear Plant pump testing program, and the EG&G reviewer's evaluations and conclusions regarding these requests. Similar information is presented in Section 4 for the valve testing program.

Category A, B, and C valves which are exercised at cold shutdown and refueling outages and meet the requirements of the ASME Code, Section XI, are addressed in Appendix A.

A listing of P&IDs and Figures used for this review is contained in Appendix B.

Inconsistencies and omissions in the licensee's IST program noted during the course of this review are listed in Appendix C. The licensee should resolve these items in accordance with the evaluations, conclusions, and guidelines presented in this report.

2. SCOPE

The EG&G Idaho review of the Donald C. Cook Nuclear Plant inservice testing (IST) program for pumps and valves was begun in April, 1987. The program initially examined was Revision 0, dated December 1985, which identified the licensee's proposed testing of safety related pumps and valves in the plant systems listed in Appendix B.

The licensee's proposed IST program was reviewed by locating and highlighting the components on the appropriate system P&IDs and determining their function in the system. Then the licensee's proposed testing was evaluated to determine if it was in compliance with the ASME Code, Section XI, requirements. During the course of this review, questions and comments were made pertaining to unclear or potential problem areas in the licensee's IST program. These were transmitted to the licensee in the form of a request for additional information (RAI) which served as the agenda for the working meeting between the licensee, the NRC, and the EG&G reviewers.

Each pump and valve relief request was individually evaluated to determine if the licensee had clearly demonstrated that compliance with the Code requirements is impractical or presents a hardship without a compensating increase in safety for the identified system components, and to determine if the proposed alternate testing would provide a reasonable indication of component operability. Where the licensee's technical basis or alternate testing was insufficient, the licensee was requested to clarify the relief request. The system P&ID was also examined to determine whether the instrumentation necessary to make the identified measurements is available. If, based on the unavailability of adequate instrumentation, or the reviewer's experience and knowledge, it was determined that it may not be possible or practical to make the measurements identified in the licensee's IST program, a question or comment was generated requesting clarification.

For pumps, it was verified that each of the seven inservice test quantities of Table IWP-3100-1 were being measured or observed. For those test quantities that were not being measured or observed quarterly in

accordance with the Code, it was verified that a request for relief from the Code requirements had been submitted. If the testing was not being performed in accordance with the Code and a relief request had not been submitted, the licensee was requested to explain the inconsistency in the RAI.

The review of the proposed testing of valves verified that all appropriate ASME Code testing for each individual valve is performed as required. The proposed testing was evaluated to determine if all valves that were judged to be active Category A, B, and/or C, (other than safety and relief valves) are exercised quarterly in accordance with IWV-3410 or 3520. If any active safety related valve is not full-stroke exercised quarterly as required, then the licensee's justification for the deviation, either in the form of a cold shutdown justification or a relief request, was examined to determine its accuracy and adequacy. The proposed alternate testing was also evaluated to determine its compliance with the Code requirements.

Safety-related safety valves and relief valves, excluding those that perform only a thermal relief function, were confirmed to be included in the IST program and are tested in accordance with IWV-3510.

For valves with remote position indication, the reviewer confirmed that the valve remote position indication is verified in accordance with IWV-3300. The reviewer verified that the licensee had assigned limiting values of full-stroke times for all power operated valves in the IST program as required by IWV-3413. For valves having a fail-safe actuator, the reviewer confirmed that the valve's fail-safe actuator is tested in accordance with IWV-3415.

Each check valve was evaluated to determine if the proposed testing would verify its ability to perform its safety function(s). Extensive system knowledge and experience with other similar facilities is used to determine whether the proposed tests would full-stroke exercise the check valve disks open or verify their reverse flow closure capability. If there was any doubt about the adequacy of the identified testing, questions were included in the RAI.

Further evaluation was performed on all valves in the program to determine that the identified testing could practically and safely be conducted as described. If the licensee's ability to perform the testing was in doubt, a question was formulated to alert the licensee to the suspected problem.

Once all of the components in the licensee's IST program had been identified on the P&IDs and evaluated as described above, the P&IDs were examined closely by at least two trained and experienced reviewers to identify any additional pumps or valves that may perform a safety function. The licensee was asked to reconcile any components that were identified by this process which were not included in the IST program. Also, the list of systems included in the licensee's program was compared to a system list in the Draft Regulatory Guide and Value/Impact Statement titled, "Identification of Valves for Inclusion in Inservice Testing Programs." Systems that appear in the Draft Regulatory Guide list but not in the licensee's program were evaluated and, if appropriate, questions were added to the RAI.

Additionally, if the reviewers suspected a specific or a general aspect of the licensee's IST program, questions were included in the RAI to clarify those areas of doubt. Some questions were included to allow the reviewers to make conclusive statements in the RAI.

The review was completed and the RAI was transmitted to the licensee. These questions were later used as the agenda for the working meeting with the licensee on July 14 and 15, 1987. At the meeting, each question and comment was discussed in detail and resolved as follows:

a. The licensee agreed to make the necessary IST Program corrections or changes to satisfy the concerns of the NRC and their reviewers.

b. The licensee provided additional information or clarification about their IST Program that satisfied the concerns of the NRC and their reviewers, and no program change is required.

c. The item remained open for the licensee to further investigate and propose a solution to the NRC.

d. The item remained open for further investigation by the NRC.

e. The item remained open for further investigation and discussion by both the NRC and the licensee.

A revised IST program dated October 5, 1987 was received and compared to the previous submittal to identify any changes. The changes were evaluated to determine whether they were acceptable and, if not, they were added to the items that remained open from the meeting. Several conference calls were held between the licensee, the NRC, and the reviewers to clarify the NRC positions on the open items and discuss the licensee's proposed resolutions.

This TER is based on information contained in the submittals and on information obtained in the meetings and conference calls which took place during the review process.

3. PUMP TESTING PROGRAM

The Donald C. Cook Nuclear Plant, Units 1 and 2, IST Program submitted by Indiana and Michigan Electric Company was examined to verify that all pumps that are included in the program are subjected to the periodic tests required by the ASME Code, Section XI, except for those pumps identified below for which specific relief from testing has been requested and as summarized in Appendix C. Each Indiana and Michigan Electric Company basis for requesting relief from the pump testing requirements and the reviewer's evaluation of that request are summarized below.

3.1 Diesel Fuel Oil Transfer Pumps

3.1.1 Bearing Temperature Measurement

3.1.1.1 Relief Request. The licensee has requested relief from bearing temperature measurement requirements of Section XI, Paragraph IWP-3300, for the diesel fuel oil transfer pumps, QT-106-AB1, AB2, CD1, and CD2. The licensee has proposed no alternate testing.

3.1.1.1.1 Licensee's Basis for Requesting Relief--The intent of Paragraph IWP-4310 is to exempt those pump bearings in the main flow path from temperature measurement requirements. However, if code relief is required, we request that the diesel fuel oil transfer pumps be exempt from bearing temperature requirements as stated in Section XI Paragraph IWP-3300.

The inboard and outboard sleeve bearings on those 2 HP gear pumps are lubricated and cooled by the pumped fluid. Temperature readings are therefore inconclusive since bearing measurement points are not responsive to the changes in bearing temperature.

Bearing problems on gear pumps can be more readily identified by degradation of pump capacity. Flow rate deterioration indicates the existence of excessive clearance due to bearing wear and problems.

In addition, the code required pump running time for yearly bearing temperature measurement can not be met due to the limited capacity of the diesel generator fuel oil day tank.

3.1.1.1.2 Evaluation--The bearings on the diesel fuel oil transfer pumps are in the main flow path of the fluid being pumped. Therefore, temperature measurement, as outlined in Section XI, paragraph IWP-4300, is not required and no relief is necessary.

3.1.2 Duration of Tests

3.1.2.1 Relief Request. The licensee has requested relief from the duration of pump testing requirements of Section XI Paragraph IWP-3500, for the diesel fuel oil transfer pumps, QT-106-AB1, AB2, CD1, and CD2. The licensee has proposed recording test parameters immediately after pump operation has stabilized.

3.1.2.1.1 Licensee's Basis for Requesting Relief--These pumps supply the diesel generator fuel oil day tank. A conservative level is maintained in the tank to meet the minimum capacity per Technical Specification requirements. Due to the limited capacity of this tank, the pump operating test range is restricted. It is requested to record test parameters immediately after pump operation has stabilized.

3.1.2.1.2 Evaluation--These pumps supply the diesel generator fuel oil day tank. The capacity of the day tank above the minimum Technical Specification requirement is not sufficient to allow the 5 minute minimum duration of testing required by the Code without overfilling the day tank. Compliance with this Code requirement would necessitate redesign of the system. A pump run time of less than 5 minutes should not affect the test data.

Based on the determination that the proposed testing provides reasonable assurance of operational readiness, that complying with the Code requirements is impractical, and considering the burden on the licensee if the Code requirements were imposed, relief may be granted.

3.2 Spent Fuel Pit Cooling Pumps

3.2.1 Flow Rate Measurement

3.2.1.1 Relief Request. The licensee has requested relief from the flow measurement requirements of Section XI, Paragraph IWP-3100 and Table IWP-3100-1, for the spent fuel pit cooling pumps, PP-31N and PP-31S.

3.2.1.1.1 Licensee's Basis for Requesting Relief--The original design of the spent fuel pit cooling system did not incorporate flow measuring devices for these pumps. The primary function of the spent fuel pit cooling system is to remove the decay heat generated by the spent fuel elements stored in the pit. The water from the pit flows to the suction of the spent fuel pit cooling pump and is pumped, through a heat exchanger where it is cooled, back to the spent fuel pit. Duplicate pumping loops are provided to assure proper backup. By setting the discharge valve downstream of the heat exchanger to a specific predetermined setting, a repeatable system with a fixed resistance has been established. We propose to measure the differential pressure of the spent fuel pit cooling pump(s) in this fixed configuration to ascertain their operational readiness and determine any potential degradation. The water in this system is of high purity which precludes the fouling of the system, hence changes in differential pressure would be a good indication of changes in pump performance. In addition, pump vibration is measured and trended which would indicate potential mechanical problems.

While the spent fuel pit system provides cooling of the spent fuel pit water, it is not required for the safe shutdown of the plant nor does it mitigate the consequences of an accident. It is the level in the pit that determines the adequacy of the spent fuel pit cooling system. Failure of the redundant pumps would not jeopardize the cooling system since makeup water is available from the following sources to maintain level:

1. Refueling water storage tanks via the refueling water purification pumps.
2. Primary water storage tank
3. Auxiliary building fire header via temporary hoses.

The spent fuel pit cooling system is closely monitored. Low level and high temperature as well as spent fuel pit cooling pump failure alarms would annunciate to indicate an abnormal condition and specifically a loss of cooling water flow. This would allow for the timely switch over to the redundant cooling pump and/or to correct any system problems.

The redundant spent fuel cooling pumps are of the horizontal centrifugal type with stainless steel materials and very reliable, especially in a fixed system with good water such as exists in the spent fuel pit cooling system. A review of all maintenance records on these pumps indicate there have been no failures and, further, the maintenance performed has been routine in nature.

In view of the above, we contend that the spent fuel pit cooling pumps can be properly monitored without measuring flow and without sacrificing any reliability to the spent fuel pit cooling system.

3.2.1.1.2 Evaluation--Fuel in the spent fuel cooling pit may be protected if there is sufficient water in the pit, and there are three backup sources of water to maintain level in the spent fuel cooling pit. However, NUREG-0800, Standard Review Plan, Chapter 9.1.3 (Spent Fuel Pool Cooling and Cleanup System), states that the capability to provide adequate cooling to the spent fuel during all operating conditions is reviewed on one of two bases. The first basis requires the cooling portion of the system to be designed to seismic Category I, Quality Group C requirements. The second basis allows a non-seismic spent fuel pool cooling system provided the following systems are designed to seismic Category I requirements and are protected against tornadoes: the fuel pool makeup water system and its source, and the fuel pool building and its ventilation and filtration system. The information provided in the licensee's relief request does not indicate whether the makeup water systems and water sources are safety grade systems. Further, no information is provided concerning the spent fuel building ventilation and filtration systems.

The NRC staff position is that lack of installed instrumentation is not a sufficient long term justification for not measuring a Code required

parameter. The licensee's proposal to set the spent fuel pit cooling pumps' discharge valve to a predetermined setting and measure the differential pressure across the valve, versus measuring flow, is not in compliance with this position. The licensee has not demonstrated the impracticality of measuring flow, at least on a refueling outage frequency, utilizing an external instrument such as a portable ultrasonic flow instrument. Also, the spent fuel pit cooling system drawing number 12-5136 (Rev. 25 dated 3-19-87) shows installed instrumentation on the pump discharges which the licensee has failed to mention or discuss.

Based on the determination that the licensee has not provided sufficient technical justification for granting relief, and that the licensee's proposed alternate testing is inadequate, relief should not be granted.

4.0 VALVE TESTING PROGRAM

The Donald C. Cook Nuclear Plant IST Program submitted by Indiana and Michigan Electric Company was examined to verify that all valves included in the program are subjected to the periodic tests required by the ASME Code, Section XI, and the NRC positions and guidelines. The reviewer found that, except as noted in Appendix C or where specific relief from testing has been requested, these valves are tested to the Code requirements and NRC positions and guidelines. Each Indiana and Michigan Electric Company basis for requesting relief from the valve testing requirements and the reviewer's evaluation of that request is summarized below and grouped according to system and valve category. All relief requests and evaluations are applicable to both Units 1 and 2 unless otherwise noted. If valve and/or relief request numbers differ between Units, the numbers for Unit 2 will be stated in parentheses immediately following those for Unit 1.

4.1 General Relief Requests

4.1.1 Stroke Timing Fast Acting Valves

4.1.1.1 Relief Request. The licensee has requested relief from the timing tolerance and trending requirements of Section XI, Paragraphs IWV-3413(b) and IWV-3417(a), for fast acting valves (those with maximum limiting stroke times of five seconds or less determined from historical stroke time values and/or valve design specification).

4.1.1.1.1 Licensee's Basis for Requesting Relief--Code relief is requested for timing tolerance and trending per paragraphs IWV-3413(b) and IWV-3417(a) for fast acting valves (those with the maximum limiting stroke times of five seconds or less determined from historical stroke time values and/or valve design specification). The major influence in the stroke time testing of fast acting valves is the operator's response. Therefore, timing tolerances are influenced by operator action and trending is not indicative of valve performance. The fast acting valves have been identified as "ETF" and acceptance criteria is defined as follows:

Valve Stroke Time Less Than or Equal to 2 Seconds

Historical Stroke Time Range in Seconds	Established Base Line on Curves in Seconds	Recommended Action Time (Limiting Stroke Time Values in Seconds) Base Line Time x 2 + 1 second=Recommended Action Time or Tech. Spec. Limit, whichever is less.
up to .74	0.5	= .5 x 2 + 1 = 2 seconds
.75 to 1.24	1.0	= 1 x 2 + 1 = 3 seconds
1.24 to 1.74	1.5	=1.5 x 2 + 1 = 4 seconds
1.75 to 2.49	2.0	= 2 x 2 + 1 = 5 seconds

4.1.1.1.2 Evaluation--Section XI, Paragraph IWV-3413(b), requires the stroke times of power operated valves to be measured to the nearest second for stroke times less than or equal to 10 seconds. The licensee has requested relief from this Code requirement, however, the licensee's proposed acceptance criteria for the limiting values of full-stroke time for all power operated valves indicates that the licensee is rounding stroke times to the nearest second. Therefore, it is unclear why the licensee has requested relief from this requirement.

The values of stroke time for fast acting valves can be greatly affected by operator response and, therefore, may not be indicative of changes in valve performance. An alternative acceptable to the staff regarding stroke time measurements for rapid-acting valves is explained in detail in Generic Letter 89-04, "Guidance on Developing Acceptable Inservice Testing Programs". The applicable excerpts from this generic letter are included in Appendix D of this report. The licensee has neither provided an explanation of what actions would be taken when the "Recommended Action Time" of their acceptance criteria is exceeded, nor explained why valves with stroke times between 2 seconds and 5 seconds should be considered fast acting valves. Further, the licensee has not provided a technical justification for their proposed alternate testing that demonstrates this testing provides a reasonable alternative to the Code requirements, and that

degradation will be detected and corrective action taken prior to valve failure.

Based on the determination that the licensee has not demonstrated that the proposed alternate testing provides reasonable assurance of operational readiness, relief should not be granted.

4.1.2 Leakage Testing of Containment Isolation Valves

4.1.2.1 Relief Request. The licensee has requested relief from the leak rate testing requirements of Section XI, Subsection IWV-3420, except for paragraphs IWV-3426 and 3427, for all containment isolation valves. The licensee has proposed instead to perform seat leakage tests of these valves in accordance with 10 CFR 50, Appendix J.

4.1.2.1.1 Licensee's Basis for Relief--The licensee has provided no basis for this relief request. It is, however, an established NRC staff position to allow leak rate testing of containment isolation valves per 10 CFR 50, Appendix J, in place of Section XI requirements.

4.1.2.1.2 Evaluation--Appendix J, type C, leak rate testing meets the requirements of Section XI leak rate testing. Therefore, the licensee's proposed alternate testing, to perform seat leakage tests of containment isolation valves in accordance with 10 CFR 50 Appendix J, in lieu of Section XI requirements except Paragraphs IWV-3426 and IWV-3427, is acceptable.

Based on the determination that the proposed alternate testing is equivalent to the Code required testing and would, therefore, provide an acceptable level of quality and safety, relief may be granted as requested.

4.2 Main Steam System

4.2.1 Category C Valves

4.2.1.1 Relief Request. The licensee has requested relief from the quarterly exercising requirements of Section XI, Paragraph IWV-3522, for the

main steam to turbine driven auxiliary feedwater pump check valves, MS-108-2 and 108-3. The licensee has proposed to verify valve closure by disassembly on a sampling basis at a refueling outage frequency.

4.2.1.1.1 Licensee's Basis for Relief--These check valves are located in the steam supply lines to the Auxiliary Feedwater Pump Turbine. These valves operate during normal IST feedwater pump testing. Normal design flow rate for this pump is 900 GPM. However, flow is restricted to a maximum of approximately 700 GPM through the 3" test line used during pump test. The check valves are therefore stroked to the extent that they pass the required steam flow to drive the turbine driven auxiliary feed pump at a flow rate of 700 GPM. Steam flow through these valves to the auxiliary feedwater pump turbine is verified to within 10% (at 900 GPM flow to SG's, 31,000 lbs/hr steam vs. 700 GPM flow through test line, 28,000 lbs/hr steam) of the maximum requirement. This is considered adequate for full stroke testing. In addition, due to the plant design, the only method available to verify the valve closure is disassembly. The valve is not equipped with position indication.

4.2.1.1.2 Evaluation--It is not possible to achieve full-rated steam flow through these check valves during quarterly pump testing through the 3 inch test line. The licensee has stated that steam flow has been verified to be within 10% of full-rated flow. A check valve exercise test with less than full rated flow may be considered a full-stroke exercise of the check valve provided the licensee can prove that the disk moves to the full open position with the passage of flow at the reduced rate. However, since the licensee has not verified that the valve disc moves to the full open position when flow is 90% of full-rated flow, the licensee's testing cannot be considered a full-stroke.

The licensee has stated in Note 3(2) for drawing no. 1(2)-5106A of the feedwater system, that the turbine driven auxiliary feedwater pump is run at full rated flow on a refueling outage frequency. The current testing of a part-stroke to the open position quarterly with a full-stroke to the open position performed on a refueling outage frequency is acceptable.

Due to plant design, it is not possible to verify closure of these valves by leak testing. Valve disassembly and inspection is generally an acceptable method of verifying closure capability. However, the licensee's testing must conform to the NRC staff positions on testing check valves by disassembly. The D.C. Cook IST program does not conform to these positions.

The NRC staff positions regarding full flow testing of check valves and check valve testing by disassembly are explained in detail in Generic Letter 89-04, "Guidance on Developing Acceptable Inservice Testing Programs". The applicable excerpts from this generic letter are included in Appendix D of this report.

Based on the determination that the Code required testing is impractical, considering the burden on the licensee if Code requirements were imposed, and provided the D. C. Cook IST program is changed to comply with the NRC staff positions on sample disassembly and inspection, relief may be granted as requested.

4.3 Feedwater System

4.3.1 Category C Valves

4.3.1.1 Relief Request. The licensee has requested relief from the requirements of Section XI, Paragraph IWV-3521, quarterly exercising to the closed position, for the feedwater header check valves, FW-118-1, 2, 3, and 4. The licensee has proposed that these valves will be confirmed closed by disassembly on a sampling basis during refueling outages.

4.3.1.1.1 Licensee's Basis for Relief--The function of these valves is to provide feedwater flow from the main feedwater pumps to the steam generators. These valves cannot be exercised during power operation because closing of these valves would require securing feedwater flow to the steam generator and partial stroking may cause instability of steam generator water level which could result in a reactor trip. Further three loop operation is not allowed per D.C. Cook Nuclear Plant Technical Specification 3.4.1.1. These valves will be confirmed closed by disassembly on a sampling basis during refueling outages.

4.3.1.1.2 Evaluation--Exercising these valves to the closed position would require the isolation of feedwater to a steam generator, which, during power operation could result in a reactor trip. Three loop operation is not allowed per Technical Specifications. The NRC staff position is that valve disassembly and inspection can be used as a positive means of verifying closure capability, as permitted by IWV-3522. However, in order to grant relief which allows this testing to be done at a refueling outage frequency the licensee must first demonstrate the impracticality of performing the Code required testing at the Code required frequency. In order to grant relief which allows this testing to be done on a sampling basis at a refueling outage frequency, the licensee must further demonstrate that all other means of testing are impractical and that it is burdensome to disassemble and inspect all applicable valves each refueling outage. The licensee has not demonstrated the impracticality of performing testing at a cold shutdown frequency to verify valve closure. Further, the licensee has not shown that leak rate testing to verify valve closure cannot be done.

Based on the determination that the licensee has not demonstrated the impracticality of the Code required testing relief should not be granted.

4.4 Essential Service Water System

4.4.1 Category B Valves

4.4.1.1 Relief Request. The licensee has requested relief from the requirements of Section XI, Paragraph IWV-3411, quarterly exercising to the open position, for the essential service water to the auxiliary feed pump suction valves, ESW-109 (145), 115 (240), and 243. The licensee has proposed full-stroke exercising these valves during refueling outages.

4.4.1.1.1 Licensee's Basis for Relief--These valves are normally closed and are required to be open when the condensate storage tank is exhausted. Exercising the valves could cause lake water contamination of the steam generators. Lake water chemistry can potentially impact steam generator tube integrity. We believe that testing at a refueling outage frequency is sufficient to demonstrate operability of this long term valve. Since the valves are manual, stroke timing is not required.

4.4.1.1.2 Evaluation--The introduction of raw water into the steam generators would adversely impact steam generator tube integrity. Opening these valves can cause raw water contamination of the steam generators unless portions of the essential service water and auxiliary feedwater systems are isolated prior to testing, and flushed afterwards to remove impurities. Quarterly exercising of these valves cannot be performed because these systems cannot be removed from service during power operation. However, the licensee has failed to provide a technical justification for not exercising these valves during cold shutdowns. The licensee has made no mention of any special test conditions which require testing to be performed only at a refueling outage frequency.

Based on the determination that the licensee has failed to provide a technical justification for not testing these valves during cold shutdowns, relief should not be granted.

4.4.1.2 Relief Request. The licensee has requested relief from the exercising, fail safe testing, and stroke timing requirements of Section XI, Paragraphs IWV-3411, 3415, and 3413 respectively, for valves WRV-721 (722), 723 (724), 725 (726), and 727 (728). These valves are the temperature regulating valves for the emergency diesel generator air after coolers. The licensee has proposed that these valves be considered operable upon the successful completion of diesel generator testing, and that fail safe testing be performed during refueling outages. No alternate testing has been proposed for stroke timing.

4.4.1.2.1 Licensee's Basis for Relief--These valves are located in the essential service water supply lines to the emergency diesel generators air after coolers. These three-way valves regulate water flow to maintain the temperature at which the after cooler air discharge thermostatic controller has been set. Water flow is regulated by passing a portion of the flow through the air coolers and bypassing the excess flow around the air after coolers. We are requesting Code relief from the testing requirements since, (1) these valves function only as regulating valves and not open/closed valves, (2) These valves are demonstrated operable during diesel generator testing. Diesel generators are tested on a

staggered basis, every 31 days per Technical Specification 4.8.1.1.2; and (3) these valves are demonstrated operable during diesel generator 24 hour runs performed each refueling outage. The valves cannot be stroke timed because they are thermostatic valves whose position is controlled by process fluid temperature. There is no external control available.

4.4.1.2.2 Evaluation--These are thermostatic control valves whose position is controlled by temperature. There are no external controls or visible moving parts. The operability of these valves is demonstrated during diesel generator testing performed every 31 days, and during 24 hour runs each refueling outage.

Based on the determination that the Code required testing is impractical, that the proposed alternate testing provides reasonable assurance of operational readiness, and considering the burden on the licensee if Code requirements were imposed, relief may be granted as requested.

4.5 Station Drainage - Containment

4.5.1 Category A/C Valves

4.5.1.1 Relief Request. The licensee has requested relief from the requirements of Section XI, Paragraph IWV-3521, quarterly exercising to the closed position, for the containment isolation check valve, NS-357. The licensee has proposed that the valve be full-stroke exercised to the open position by performing a flow test quarterly and confirmed closed during the seat leakage testing per the Appendix "J" program at a refueling frequency.

4.5.1.1.1 Licensee's Basis for Relief--This check valve is located on the return line of the post accident sampling system inside the containment. The line is open-ended inside the containment and the check valve is not equipped with position indication.

4.5.1.1.2 Evaluation--This is a containment isolation check valve located inside containment and is, therefore, inaccessable during reactor

operation. The only method available to verify valve closure is leak testing, which would require a containment entry. Testing this valve during cold shutdowns would result in increased radiation doses to plant personnel. Further, this would require a significant amount of time for test equipment setup, test performance, and test equipment removal and could, therefore, result in a delay in the return to power.

This valve recieves an Appendix "J", Type C, leak rate test during refueling outages which is equivalent to the Section XI leak rate testing requirements. The licensee's proposed testing conforms to an established NRC staff position which allows containment isolation check valves located inside the containment to be leak tested for closure at a refueling outage frequency per the Appendix "J" testing program.

Based on the determination that the proposed alternate testing would provide an acceptable level of quality and safety, relief may be granted as requested.

4.6 Reactor Coolant System

4.6.1 Category A/C Valves

4.6.1.1 Relief Request. The licensee has requested relief from the requirements of Section XI, Paragraph IWV-3521, quarterly exercising to the closed position, for the containment isolation check valves, CS-442-1, 2, 3, and 4. The licensee proposes to full-stroke exercise these valves at a refueling outage frequency.

4.6.1.1.1 Licensee's Basis for Relief--These containment isolation check valves are on the seal water supply line to the reactor coolant pumps (RCP). These valves cannot be part or full stroke exercised to the closed position during power operation because cooling flow is required to the RCP seals. During cold shutdown, seal water must be maintained to prevent backflow through the seals with possible damage from dirt.

4.6.1.1.2 Evaluation--Closing these valves would result in the loss of seal water to the reactor coolant pumps. Closing these valves during pump operation could cause damage to the RCP seals and result in an unisolable leak from the reactor coolant system. Closing these valves during cold shutdowns when the reactor coolant system is still at pressure would cause backflow through the seals from the reactor coolant system. This could result in damage from particulate that normally circulates in the reactor coolant system.

The licensee's proposal to exercise these valves closed during refueling outages, when the reactor coolant system is depressurized, should demonstrate the ability of these valves to perform their safety function in the closed position.

Based on the determination that the Code required testing is impractical, that the proposed alternate testing provides reasonable assurance of operational readiness, and considering the burden on the licensee if Code requirements were imposed, relief may be granted as requested.

4.6.1.2 Relief Request. The licensee has requested relief from the requirements of Section XI, Paragraph IWV-3521, quarterly exercising to the closed position, for the containment isolation check valves PW-275 and N-159. The licensee has proposed to verify valve closure during seat leakage testing per Appendix "J" program at a refueling outage frequency.

4.6.1.2.1 Licensee's Basis for Relief--Valve PW-275 is a containment isolation check valve located in the primary water supply line to the pressurizer relief tank. Valve N-159 is a containment isolation check valve located in the nitrogen supply line to the pressurizer relief tank. These valves are not equipped with position indication. These valves cannot be full stroke tested to closed position during power operation or at a cold shutdown frequency due to the lack of sufficient differential pressure to back seat the valves. The valves and necessary test connections are located inside the containment. Due to the plant design, the only method available to verify the valves closure is leak testing.

4.6.1.2.2 Evaluation--These valves are containment isolation check valves located inside containment and are, therefore, inaccessable during reactor operation. The only method available to verify valve closure is leak testing, which would require a containment entry. Testing these valves during cold shutdowns would result in increased radiation doses to plant personnel. Further, this would require a significant amount of time for test equipment setup, test performance, and test equipment removal and could, therefore, result in a delay in the return to power.

These valves recieve an Appendix "J", Type C, leak rate test during refueling outages which is equivalent to the Section XI leak rate testing requirements. The licensee's proposed testing conforms to an established NRC staff position which allows containment isolation check valves located inside the containment to be verified closed by leak testing at a refueling outage frequency per the Appendix "J" testing program.

Based on the determination that the proposed alternate testing would provide an acceptable level of quality and safety, relief may be granted as requested.

4.6.1.3 Relief Request. The licensee has requested relief from the quarterly exercising requirements of Section XI, Paragraph IWV-3521, for the containment isolation check valve, SI-189. The licensee has proposed that the test be run at a refueling frequency when there is no potential for overpressurization.

4.6.1.3.1 Licensee's Basis for Relief--This check valve is located in the safety valves (SV) discharge (emergency core cooling SVs, RHR SVs, centrifugal charging pump SVs, ect.) collection header leading to the pressurizer relief tank. Isolating this valve for testing would result in dead heading all safety valves in the above systems. This would result in loss of overpressurization protection and could put the plant in an unsafe condition.

4.6.1.3.2 Evaluation--Isolating this valve to perform testing would result in a loss of overpressure protection for some safety-related

systems. The only time overpressure protection would not be required is during refueling outages when these systems are not in use and the reactor coolant system is depressurized.

Valve SI-189 is a normally closed containment isolation check valve located inside the containment. Leak rate testing is the only practical method for verifying this valve's closure capability. This valve is inaccessible during reactor operation. However, the licensee has provided no information as to why this valve must be isolated to perform a full-stroke to the open position, nor has any information been provided as to how a full-stroke of this valve is performed.

Based on the determination that exercising this valve closed as required by the Code is impractical, that the proposed alternate testing provides reasonable assurance of operation readiness, and considering the burden on the licensee if Code requirements were imposed, relief may be granted from exercising valve SI-189 to the closed position only. Based on the reasons cited above, relief from exercising this valve to the open position should not be granted.

4.6.2 Category B Valves

4.6.2.1 Relief Request. The licensee has requested relief from the exercising, stroke timing, and fail-safe testing requirements of Section XI, Paragraphs IWV-3411, 3413(b), and 3415 respectively, for the reactor head vent valves, NSO-021, 022, 023, and 024. The licensee has proposed performing all Code required testing for these valves on a refueling outage frequency.

4.6.2.1.1 Licensee's Basis for Relief--These four one-inch solenoid operated isolation valves are installed (two in each leg in series) in the reactor head vent. These valves cannot be tested during power operation, hot standby, or hot shutdown because the valve design is such that testing of either valve can cause "burping" (momentary opening) of the second valve resulting in the release of radioactive fluid and create an airborne situation in containment. The valves also cannot be tested during

cold shutdown unless the RCS is operating at half loop, because testing of these valves can create a similar situation as that described above. Since half loop of the RCS operation is not a normal evolution during cold shutdowns, full-stroke test for these valves will be scheduled at refueling frequency.

Exercising the solenoid operated valves for verification of valve position (valve stem movement) will be performed during each refueling outage by performing a flow test through each valve because the valve stem is completely enclosed and cannot be observed. The reactor coolant discharged during the flow testing of the valves is collected in a container to minimize liquid contamination spill, radiation, and potential airborne situation in deference to ALARA consideration and personnel protection.

4.6.2.1.2 Evaluation--These valves cannot be exercised during operation, hot standby, or hot shutdown because the "burping" phenomena described above could result in an airborne contamination situation. However, the licensee has not provided sufficient technical justification for not performing the Code required testing at a cold shutdown frequency. Any coolant discharged during cold shutdown testing, if "burping" occurred, could be collected in containers. The typically rapid stroke time of solenoid valves while RCS pressure and temperature are low, would result in little, if any, coolant discharge.

The licensee has not adequately explained why the plant must be placed in a half-loop condition to perform the Code required testing. Further, the licensee has not provided the technical justification for not performing their proposed alternate testing at a cold shutdown frequency. Inconvenience is not sufficient justification for deviation from Code requirements.

Based on the determination that the licensee has not provided an adequate justification for not performing the Code required testing at cold shutdowns, relief should not be granted.

4.6.2.2 Relief Request. The licensee has requested relief from the exercising, stroke timing, and fail-safe testing requirements of Section XI,

Paragraphs IWV-3411, 3413(b), and 3415 respectively, for the pressurizer vent valves, NSO-061, 062, 063, and 064. The licensee has proposed performing all Code required testing for these valves on a refueling outage frequency.

4.6.2.2.1 Licensee's Basis for Relief--These four one-inch solenoid operated isolation valves are installed (two in each leg in series) in the pressurizer vent. These valves cannot be tested during power operation, hot standby, or hot shutdown because the valve design is such that testing of either valve can cause "burping" (momentary opening) of the second valve resulting in the release of radioactive fluid and create an airborne situation in containment. The valves also cannot be tested during cold shutdown unless the RCS is operating a half loop, because testing of these valves can create a similar situation as that described above. Since half loop of the RCS operation is not a normal evolution during cold shutdowns, full-stroke test for these valves will be scheduled at refueling frequency.

Exercising the solenoid operated valves for verification of valve position (valve stem movement) will be performed during each refueling outage by performing a flow test through each valve because the valve stem is completely enclosed and cannot be observed. The reactor coolant discharged during the flow testing of the valves is collected in a container to minimize liquid contamination spill, radiation, and potential airborne situation in deference to ALARA consideration and personnel protection.

4.6.2.2.2 Evaluation--These valves cannot be exercised during operation, hot standby, or hot shutdown because the "burping" phenomena described above could result in an airborne contamination situation. However, the licensee has not provided sufficient technical justification for not performing the Code required testing at a cold shutdown frequency. Any coolant discharged during cold shutdown testing, if "burping" occurred, could be collected in containers. The typically rapid stroke time of solenoid valves while RCS pressure and temperature are low, would result in little, if any, coolant discharge.

The licensee has not adequately explained why the plant must be placed in a half-loop condition to perform the Code required testing. Further, the licensee has not provided the technical justification for not performing their proposed alternate testing at a cold shutdown frequency. Inconvenience is not sufficient justification for deviation from Code requirements.

Based on the determination that the licensee has not provided an adequate justification for not performing the Code required testing at cold shutdowns, relief should not be granted.

4.7 Chemical and Volume Control System

4.7.1 Category B Valves

4.7.1.1 Relief Request. The licensee has requested relief from the fail safe testing and stroke timing requirements of Section XI, Paragraphs IWV-3415 and 3413(b) respectively, for the normal charging line control valves, QRV-200 and 251. The licensee has proposed no alternate testing.

4.7.1.1.1 Licensee's Basis for Relief--These valves cannot be "fail safe" tested nor stroke timed since position indication is not provided.

4.7.1.1.2 Evaluation--The licensee has provided little technical justification for not performing the Code required testing. The licensee has proposed no alternate testing.

Based on the determination that insufficient technical justification has been provided to demonstrate the impracticality of the Code required testing, and considering that no alternate testing has been proposed, relief should not be granted.

4.7.2 Category A/C Valves

4.7.2.1 Relief Request. The licensee has requested relief from the quarterly exercising requirements of Section XI, Paragraph IWV-3521, for the

charging pump discharge check valves, CS-299E and 299W. The licensee has proposed that these valves be part-stroke exercised quarterly and full-stroke exercised during refueling outages.

4.7.2.1.1 Licensee's Basis for Relief--These check valves located on the discharge lines of the "E" and "W" charging pumps function as pressure isolation valves to protect the low pressure charging pump suction lines. These valves cannot be full-stroke exercised during: (1) power operation because the charging pumps cannot achieve maximum flow rate with the reactor at full pressure, and (2) cold shutdown because the flow required could cause a low temperature overpressure condition. The valves will be part-stroke exercised quarterly and full-stroke exercised during refueling outages.

4.7.2.1.2 Evaluation--These check valves cannot be full-stroke exercised during power operation because the charging pumps cannot achieve the flow rate required to fully stroke the valves. Attempts to full stroke exercise with flow during a cold shutdown could result in an low temperature overpressure condition. This testing could only be performed if the system were significantly redesigned.

Based on the determination that the Code required testing is impractical, that the proposed alternate testing provides reasonable assurance of operational readiness, and considering the burden on the licensee if Code requirements were imposed, relief may be granted as requested.

4.7.2.2 Relief Request. The licensee has requested relief from the requirements of Section XI, Paragraph IWV-3521, quarterly exercising to the closed position, for the charging header to the reactor coolant system containment isolation check valve, CS-321. The licensee has proposed exercising this valve in the open direction quarterly and in the closed direction during refueling outages.

4.7.2.2.1 Licensee's Basis for Relief--This containment isolation valve's function is to supply borated water from the volume control tank to the regenerative heat exchanger through the charging pumps for chemical shim

control and reactor coolant system makeup. Isolation of this system would result in loss of control of pressurizer level which could result in a reactor trip. This valve is tested in the open direction quarterly and confirmed closed during refueling outages in deference to ALARA considerations.

4.7.2.2.2 Evaluation--This is a containment isolation check valve located inside containment and is, therefore, inaccessable during reactor operation. The only method available to verify valve closure is leak testing, which would require a containment entry. Further, exercising this valve to the closed position during plant operation would result in a loss of pressurizer level control which could result in a reactor trip. Testing this valve during cold shutdowns would result in increased radiation doses to plant personnel. Further, this would require a significant amount of time for test equipment setup, test performance, and test equipment removal and could, therefore, result in a delay in the return to power.

This valve recieves an Appendix "J", Type C, leak rate test during refueling outages which is equivalent to the Section XI leak rate testing requirements. The licensee's proposed testing conforms to an established NRC staff position which allows containment isolation check valves located inside the containment to be leak tested for closure at a refueling outage frequency per the Appendix "J" testing program.

Based on the determination that the proposed alternate testing would provide an acceptable level of quality and safety, relief may be granted as requested.

4.7.3 Category C Valves

4.7.3.1 Relief Request. The licensee has requested relief from the requirements of Section XI, Paragraph IWV-3521, exercising to the closed position quarterly, for the boric acid system to charging pumps' suction check valve, CS-292. The licensee has proposed exercising this valve to the open position at a cold shutdown frequency and to verify valve closure at a refueling outage frequency by either radiography or disassembly and inspection.

4.7.3.1.1 Licensee's Basis for Relief--This valve is in the emergency boration path from the boric acid system to the charging pump suction header. Flow through this path is normally not provided because of the resultant large negative reactivity insertion. The valve will be full-stroke exercised in the open position at a cold shutdown frequency. The check valve is not equipped with position indication. Due to the plant design, the only methods available to verify valve closure is either radiography or disassembly which can only be performed during the refueling outage when the system is not required to be operable. The radiography method is an acceptable method to verify the valve closure (disc against the seat) under no flow condition because it provides visual observation of the valve in the closed position. The flow testing of the valve verifies that it is open. This provides assurance that the disc is free to move from the open position with flow to the closed position with no flow or reverse flow.

4.7.3.1.2 Evaluation--This valve is not equipped with position indication. Due to plant design, a leak rate test cannot be used to verify valve closure, therefore, the only method available to verify valve closure is either radiography (with no system flow) or valve disassembly and inspection, which can only be done during refueling outages. Either method could provide positive assurance of the valve's closure capability. The NRC staff position is that valve disassembly and inspection can be used as a positive means of verifying closure capability, as permitted by IWV-3522. However, the licensee's testing must conform to the NRC staff positions on testing check valves by disassembly.

The NRC staff positions regarding check valve testing by disassembly are explained in detail in Generic Letter 89-04, "Guidance on Developing Acceptable Inservice Testing Programs". The applicable excerpts from this generic letter are included in Appendix D of this report.

Based on the determination that the Code required testing is impractical, considering the burden on the licensee if Code requirements were imposed, and provided the valve disassembly and inspection testing methods (if chosen as the alternate test) comply with the NRC staff position regarding this testing, relief from exercising this valve to the closed position may be granted as requested.

4.7.3.2 Relief Request. The licensee has requested relief from the requirements of Section XI, Paragraph IWV-3521, quarterly exercising to the open position, for the charging pumps' suction check valve from the refueling water storage tank, SI-185. The licensee has proposed to full-stroke this valve during refueling outages.

4.7.3.2.1 Licensee's Basis for Relief--This normally closed valve functions to transfer the suction source of the charging pumps to the refueling water storage tanks. This valve cannot be full-stroke exercised during: (1) power operation without introducing a high concentration of boric acid in the reactor coolant system (RCS), and (2) cold shutdown because the only full flow path available is into the RCS and the system does not have sufficient volume to accommodate that flow without a possible low temperature overpressure condition.

4.7.3.2.2 Evaluation--Exercising this valve to the open position quarterly during power operation would introduce a high concentration of boric acid into the RCS. This would cause pressure, temperature, and reactivity excursions which could cause a reactor trip. Further, it cannot be exercised open during cold shutdown because the only full flow path available is to the RCS, the use of which could result in an low temperature overpressure condition.

Based on the determination that the Code required testing is impractical, that the proposed alternate testing provides reasonable assurance of operation readiness, and considering the burden on the licensee if the Code required testing were imposed, relief may be granted as requested.

4.8 Component Cooling System

4.8.1 Category B Valves

4.8.1.1 Relief Request. The licensee has requested relief from the fail safe testing and stroke timing requirements of Section XI, Paragraphs IWV-3415 and 3413(b) respectively, for the letdown heat exchanger

temperature control valve, CRV-470. The licensee has proposed no alternate testing.

4.8.1.1.1 Licensee's Basis for Relief--This air-operated valve is located in the Component Cooling Water (CCW) return from the letdown heat exchanger and controls the temperature of the letdown flow leaving the heat exchanger. The position of this valve is set by QTC-302. The valve cannot be "fail safe" tested nor stroke timed since no control switches are installed to perform those tests.

4.8.1.1.2 Evaluation--This valve is controlled by the temperature of the system process fluid and is not equipped with a control switch, which makes stroke timing impractical. However, the licensee has not demonstrated the impracticality of removing actuator power (in this case air) and observing the operation of this valve for fail-safe testing as required by the Code.

Based on the determination that stroke timing in accordance with Code requirements is impractical, and considering the burden on the licensee if Code requirements were imposed, relief from the stroke timing requirements of Section XI may be granted. However, for the reason cited above, relief from the fail-safe testing requirements of the Code should not be granted for this valve.

4.8.2 Category A/C Valves

4.8.2.1 Relief Request. The licensee has requested relief from the quarterly exercising requirements of Section XI, Paragraph IWV-3521, for the containment isolation check valve, CCW-135. The licensee has proposed to verify closure of this valve by seat leakage testing during refueling outages.

4.8.2.1.1 Licensee's Basis for Relief--This check valve cannot be tested during power operation without securing cooling water to the reactor support coolers. The valve must remain open to prevent overheating of the concrete around the reactor supports during normal operation.

4.8.2.1.2 Evaluation--This is a containment isolation check valve located inside containment and is, therefore, inaccessable during reactor operation. The only method available to verify valve closure is leak testing, which would require a containment entry. Further, exercising this valve to the closed position during plant operation would result in a loss of pressurizer level control which could result in a reactor trip. Testing this valve during cold shutdowns would result in increased radiation doses to plant personnel. Further, this would require a significant amount of time for test equipment setup, test performance, and test equipment removal and could, therefore, result in a delay in the return to power.

This valve recieves an Appendix "J", Type C, leak rate test during refueling outages which is equivalent to the Section XI leak rate testing requirements. The licensee's proposed testing conforms to an established NRC staff position which allows containment isolation check valves located inside the containment to be leak tested for closure at a refueling outage frequency per the Appendix "J" testing program.

Based on the determination that the proposed alternate testing would provide an acceptable level of quality and safety, relief may be granted as requested.

4.8.2.2 Relief Request. The licensee has requested relief from the quarterly exercising requirements of Section XI, Paragraph IWV-3521, for the containment isolation check valves, CCW-243-25, 243-72, 244-25, and 244-72. The licensee has proposed to verify closure of these valves by seat leakage testing during refueling outages.

4.8.2.2.1 Licensee's Basis for Relief--These check valves are located in the penetration cooling supply headers of the component cooling water (CCW) system inside the containment. The valves are open during power operation and cold shutdowns to provide cooling water to the main steam penetrations. These valves are not equipped with position indication. The valves are confirmed closed by seat leakage testing in accordance with Appendix "J" during refueling outages.

4.8.2.2.2 Evaluation--These valves are containment isolation check valves located inside containment and are, therefore, inaccessable during reactor operation. The only method available to verify valve closure is leak testing, which would require a containment entry. Testing these valves during cold shutdowns would result in increased radiation doses to plant personnel. Further, this would require a significant amount of time for test equipment setup, test performance, and test equipment removal and could, therefore, result in a delay in the return to power.

These valves recieve an Appendix "J", Type C, leak rate test during refueling outages which is equivalent to the Section XI leak rate testing requirements. The licensee's proposed testing conforms to an established NRC staff position which allows containment isolation check valves located inside the containment to be leak tested for closure at a refueling outage frequency per the Appendix "J" testing program.

Based on the determination that the proposed alternate testing would provide an acceptable level of quality and safety, relief may be granted as requested.

4.9 Post Accident Sampling System

4.9.1 Category A/C Valves

4.9.1.1 Relief Request. The licensee has requested relief from the requirements of Section XI, Paragraph IWV-3521, quarterly exercising to the closed position, for the containment isolation check valve, NS-283. The licensee has proposed to confirm closure of this valve during seat leakage testing per the Appendix "J" program at a refueling frequency.

4.9.1.1.1 Licensee's Basis for Relief--This containment isolation check valve is located in the sample return line of the post-accident containment hydrogen monitoring system. The valve cannot be full-stroke exercised to the closed position quarterly or at a cold shutdown frequency because: 1) due to the plant design (line is open to containment), the only method available to verify the valve closure is leak testing, and 2) the

check valve is not equipped with position indication. The valve will be full-stroke exercised in the open position by performing a flow test quarterly and will be confirmed closed during the seat leakage testing per Appendix "J" program at a refueling frequency.

4.9.1.1.2 Evaluation--This is a containment isolation check valve located inside containment and is, therefore, inaccessable during reactor operation. The only method available to verify valve closure is leak testing, which would require a containment entry. Testing this valve during cold shutdowns would result in increased radiation doses to plant personnel. Further, this would require a significant amount of time for test equipment setup, test performance, and test equipment removal and could, therefore, result in a delay in the return to power.

This valve recieves an Appendix "J", Type C, leak rate test during refueling outages which is equivalent to the Section XI leak rate testing requirements. The licensee's proposed testing conforms to an established NRC staff position which allows containment isolation check valves located inside the containment to be leak tested for closure on a refueling outage basis per the Appendix "J" testing program.

Based on the determination that the proposed alternate testing would provide an acceptable level of quality and safety, relief may be granted as requested.

4.10 Emergency Core Cooling

4.10.1 Category C Valves

4.10.1.1 Relief Request. The licensee has requested relief from the exercising requirements of Section XI, Paragraph IWV-3521, for the safety injection (SI) pump discharge check valves, SI-110N, and 110S, and common suction check valve SI-101. The licensee has proposed to full-stroke exercise these valves at a refueling outage frequency and to part-stroke exercise valve SI-101 quarterly during pump testing.

4.10.1.1.1 Licensee's Basis for Relief--Safety injection pump discharge valves, SI-110N and 110S, cannot be exercised during power operation because SI pumps cannot overcome reactor pressure. Therefore, no flow path exists and, because minimum flow lines branch off upstream of these valves, they cannot be part-stroke tested during pump testing. The common (SI pumps) suction check valve, SI-101 is part-stroke exercised at power operation during pump testing. These valves cannot be exercised during cold shutdowns because SI pumps are required to be inoperable by Technical Specification 3.5.3 to protect against low temperature overpressurization of the reactor coolant system (RCS).

4.10.1.1.2 Evaluation--Valves SI-110N and 110S cannot be exercised during power operation because the only flow path through these valves is into the RCS, and the head of the SI pumps is not sufficient to overcome RCS pressure. Valve SI-101 cannot be full-stroke exercised during power operation because there is no full flow path for exercising the valve. Testing during operation could only be accomplished if the system were significantly redesigned. These valves cannot be tested during cold shutdowns because the SI pumps are required by Technical Specifications to be inoperable to prevent a low temperature overpressurization of the RCS.

Based on the determination that the Code required testing is impractical, that the proposed alternate testing provides reasonable assurance of operation readiness, and considering the burden on the licensee if the Code required testing were imposed, relief may be granted as requested.

4.10.1.2 Relief Request. The licensee has requested relief from the quarterly exercising requirements of Section XI, Paragraph IWV-3521, for the boron injection tank discharge check valves, SI-142 L1, L2, L3, and L4. The licensee has proposed to full-stroke exercise these valves at a refueling outage frequency.

4.10.1.2.1 Licensee's Basis for Relief--These check valves are located in the supply lines from the boron injection tank (BIT) to the reactor coolant system (RCS) cold legs (loop 1 through 4). These valves

cannot be tested during power operation because this would require injecting highly concentrated boric acid solution from the BIT into the RCS resulting in probable plant shutdown. These valves cannot be part-stroke exercised using the BIT bypass line because this could result in bypassing the BIT, thereby not achieving design flow through the BIT if an accident occurred.

These valves cannot be full-stroke exercised during cold shutdown because this would require injecting the BIT into the RCS which could significantly delay startup from cold shutdown condition (the BIT would have to be brought to the proper boron concentration and the RCS would have to be diluted sufficiently to allow startup).

4.10.1.2.2 Evaluation--These valves are not equipped with position indication. The only practical method to verify a full-stroke to the open position is with flow. These valves cannot be exercised quarterly during power operation because it would require injecting highly concentrated boric acid solution into the RCS which would cause pressure, temperature, and reactivity excursions which could cause a reactor trip. These valves cannot be exercised during cold shutdowns because it could significantly delay startup as the RCS system and the BIT boron concentrations would have to be readjusted. This testing could only be accomplished if the system were substantially redesigned.

Based on the determination that the Code required testing is impractical, that the proposed alternate testing provides reasonable assurance of operational readiness, and considering the burden on the licensee if the Code required testing were imposed, relief may be granted as requested.

4.11 Residual Heat Removal System

4.11.1 Category A/C Valves

4.11.1.1 Relief Request. The licensee has requested relief from the quarterly exercising requirements of Section XI, Paragraph IWV-3521, for the accumulator discharge check valves, SI-166 L1, L2, L3, and L4. The licensee

has proposed to part-stroke exercise these valves on a refueling outage frequency and to disassemble and inspect them on a sampling basis.

4.11.1.1.1 Licensee's Basis for Relief--These check valves function to prevent backflow from the reactor coolant system (RCS) into the accumulators during normal operation. These valves function to supply flow from the accumulators to the RCS during an accident condition. These valves cannot be exercised open during power operation because the accumulators do not have sufficient head to overcome RCS pressure.

These valves cannot be exercised during cold shutdowns because it would result in a possible low temperature overpressurization of the RCS. Similarly, full-stroke testing during refueling outages is not possible because the resulting water surge into the reactor could damage the reactor internals and of the potential for high airborne radiation contamination. These valves will be partially stroke exercised during refueling outages and disassembled for internal inspection on a sampling basis.

4.11.1.1.2 Evaluation--These valves cannot be exercised during normal operation because accumulator pressure is not sufficient to open them against RCS pressure. Exercising these valves with flow during cold shutdowns could result in a low temperature overpressurization of the RCS. Full-stroke exercising during refueling outages could result in damage to core internals. Valve disassembly and inspection is generally an acceptable method full-stroke exercising check valves. However, the licensee's testing must conform to the NRC staff positions on testing check valves by disassembly. The D.C. Cook IST program does not conform to these positions.

The NRC staff positions regarding check valve testing by disassembly are explained in detail in Generic Letter 89-04, "Guidance on Developing Acceptable Inservice Testing Programs". The applicable excerpts from this generic letter are included in Appendix D of this report.

Based on the determination that the Code required testing is impractical, considering the burden on the licensee, and on the condition that the D. C. Cook IST program is changed to conform to the NRC staff

positions on sample disassembly and inspection, relief may be granted as requested.

4.11.1.2 Relief Request. The licensee has requested relief from the quarterly exercising requirements of Section XI, Paragraph IWV-3521, for the safety injection (SI) and residual heat removal (RHR) combined discharge check valves,SI-161 L1, L2, L3, and L4. The licensee has proposed part-stroking these valves at a cold shutdown frequency and full-stroking these valves on a refueling outage frequency when the reactor vessel head is removed.

4.11.1.2.1 Licensee's Basis for Relief--These check valves are located in the supply lines from the RHR and SI Pumps to the reactor coolant system (RCS) cold legs (loop 1 through 4). These valves cannot be exercised during power operation because the RHR pumps and SI pumps do not develop sufficient head to overcome RCS pressure. The valves cannot be full-stroke exercised during cold shutdown due to potential low temperature overpressurization damage to the reactor vessel. These valves will be part-stroke exercised at a cold shutdown frequency. The valves will also be full-stroke exercised at refueling frequency when the reactor vessel head is removed.

4.11.1.2.2 Evaluation--The only flow path through these valves is into the RCS. These valves cannot be exercised during power operation because the RHR and SI pumps do not develop sufficient head to overcome RCS pressure. The valves cannot be full-stroke exercised during cold shutdowns because this could result in a low temperature overpressurization of the RCS. Testing cannot be accomplished at the Code required frequency without the system being significantly redesigned.

Based on the determination that the Code required testing is impractical, that the proposed alternate testing provides reasonable assurance of operational readiness, and considering the burden on the licensee if Code requirements were imposed, relief may be granted as requested.

4.11.1.3 Relief Request. The licensee has requested relief from the quarterly exercising requirements of Section XI, Paragraph IWV-3521, for the residual heat removal (RHR) and safety injection (SI) pumps to the reactor coolant system (RCS) hot legs check valves, SI-158 L1, L2, L3, and L4. The licensee has proposed part-stroke exercising these valves at a cold shutdown frequency and full-stroke exercising them at a refueling outage frequency when the reactor vessel head is removed.

4.11.1.3.1 Licensee's Basis for Relief--Check valves SI-158 L1, L2, L3, and L4, are located in the supply lines from the RHR and SI Pumps to the RCS hot legs (loop 1 through 4). These valves cannot be exercised during power operation because the RHR pumps and SI pumps do not develop sufficient head to overcome RCS pressure. The valves cannot be full-stroke exercised during cold shutdown due to potential low temperature overpressurization damage to the reactor vessel.

4.11.1.3.2 Evaluation--The only flow path through these valves is into the RCS. These valves cannot be exercised during power operation because the RHR and SI pumps do not develop sufficient head to overcome RCS pressure. The valves cannot be full-stroke exercised during cold shutdowns because this could result in a low temperature overpressurization of the RCS. Testing of these valves cannot be accomplished at the Code required frequency without the system being significantly redesigned.

Based on the determination that the Code required testing is impractical, that the proposed alternate testing provides reasonable assurance of operational readiness, and considering the burden on the licensee if Code requirements were imposed, relief may be granted as requested.

4.11.1.4 Relief Request. The licensee has requested relief from the quarterly exercising requirements of Section XI, Paragraph IWV-3521, for the accumulator, residual heat removal (RHR). and safety injection (SI) combined header check valves, SI-170 L1, L2, L3, and L4. The licensee has proposed that the valves be part-stroke exercised on a cold shutdown frequency and disassembled on a sampling basis during refueling outages to verify full-stroke operability.

4.11.1.4.1 licensee's Basis for Relief--These valves are located on the reactor coolant system (RCS) cold leg (loops 1 through 4) injection lines from the accumulators, RHR and SI systems. They cannot be exercised during power operation because the RHR and SI pumps do not develop sufficient head to overcome the RCS pressure. Due to the plant design, the valves are sized as such that full-stroke testing cannot be attained without discharging the accumulators and operating SI and RHR pumps simultaneously. The only method available to verify the full-stroke exercising is disassembly method. The valve is not equipped with position indication.

4.11.1.4.2 Evaluation--The only flow path through these valves is into the RCS. These valves cannot be exercised during power operation because the RHR and SI pumps do not develop sufficient head to overcome RCS pressure. The required flow for full-stroke testing of these valves cannot be realistically attained during any plant mode. Valve disassembly and inspection is generally an acceptable method of full-stroke exercising check valves. However, the licensee's testing must conform to the NRC staff positions on testing check valves by disassembly. The D.C. Cook IST program does not conform to these positions.

The NRC staff positions regarding check valve testing by disassembly are explained in detail in Generic Letter 89-04, "Guidance on Developing Acceptable Inservice Testing Programs". The applicable excerpts from this generic letter are included in Appendix D of this report.

Based on the determination that the Code required testing is impractical, considering the burden on the licensee, and on the condition that the D. C. Cook IST program is changed to conform to the NRC staff positions on sample disassembly and inspection, relief may be granted as requested.

4.11.1.5 Relief Request. The licensee has requested relief from the requirements of Section XI, Paragraph IWV-3521, quarterly exercising to the closed position, for check valve N-102 in the nitrogen supply header to the emergency core cooling system accumulators. The licensee has proposed that the valve be verified closed during seat leakage testing per the Appendix "J" program at a refueling frequency.

4.11.1.5.1 Licensee's Basis for Relief--This check valve is located in the nitrogen supply header to the accumulators for blanketing purposes. The valve cannot be full-stroke exercised to the closed position during power operation or cold shutdown because, due to the plant design, the only method available to verify the valve closure is leak testing. The valve and necessary test connections are located inside the containment. The valve is not equipped with position indication. The valve will be verified closed during seat leakage testing per the Appendix "J" program at a refueling frequency.

4.11.1.5.2 Evaluation--This is a containment isolation check valve located inside containment and is, therefore, inaccessable during reactor operation. The only method available to verify valve closure is leak testing, which would require a containment entry. Testing this valve during cold shutdowns would result in increased radiation doses to plant personnel. Further, this would require a significant amount of time for test equipment setup, test performance, and test equipment removal and could, therefore, result in a delay in the return to power.

This valve recieves an Appendix "J", Type C, leak rate test during refueling outages which is equivalent to the Section XI leak rate testing requirements. The licensee's proposed testing conforms to an established NRC staff position which allows containment isolation check valves located inside the containment to be verified closed by leak rate testing at a refueling outage frequency per the Appendix "J" testing program.

Based on the determination that the proposed alternate testing would provide an acceptable level of quality and safety, relief may be granted as requested.

4.11.1.6 Relief Request. The licensee has requested relief from the quarterly exercising requirements of Section XI, Paragraph IWV-3521, for the safety injection (SI) pump discharge check valves, SI-152N, and 152S. The licensee has proposed that these valves be full-stroke exercised at a refueling frequency in conjunction with a full flow test.

4.11.1.6.1 Licensee's Basis for Relief--These check valves function to provide SI pump discharge to the hot and cold legs. These valves cannot be exercised during power operation because the SI pumps do not develop sufficient pressure to overcome reactor coolant system (RCS) pressure. These valves cannot be exercised during cold shutdown because the SI pumps are required to be inoperable by Technical Specification 3.5.3, to protect against low temperature overpressurization of the RCS. Also, during cold shutdown, there may not be sufficient volume in the RCS to accommodate the amount of water needed to full-stroke.

4.11.1.6.2 Evaluation--The only flow path through these valves is into the RCS. These valves cannot be exercised during power operation because the SI pumps do not develop sufficient head to overcome RCS pressure. These valves cannot be exercised during cold shutdown because the SI pumps are required by Technical Specifications to be inoperable to protect against low temperature overpressurization of the RCS.

Based on the determination that the Code required testing is impractical, that the proposed alternate testing provides reasonable assurance of operational readiness, and considering the burden on the licensee if Code requirements were imposed, relief may be granted as requested.

4.11.2 Category C Valves

4.11.2.1 Relief Request. The licensee has requested relief from the quarterly exercising requirements of Section XI, Paragraph IWV-3521, for the refueling water storage tank (RWST) to the residual heat removal (RHR) system check valve, SI-148. The licensee has proposed that this valve be part-stroke exercised quarterly and full-stroke exercised when the reactor cavity is being flooded at a refueling outage frequency.

4.11.2.1.1 Licensee's Basis for Relief--Check valve SI-148 is located in the RWST supply line to the RHR system. The design flow through the valve is 6000 gpm. Flow to the core is not possible when the reactor coolant system (RCS) pressure is above the shut-in pressure of the RHR pumps

(195 psig). In order to full-stroke exercise this valve, both RHR pumps must be operated and the RHR system manually aligned to recirculate flow back to the RWST. This configuration places both RHR trains inoperable since neither train can provide design flow to the core. In order to preclude placing the unit in an unsafe condition, a partial stroke test is performed quarterly with both trains operable. The valve cannot be full-stroke exercised during cold shutdowns since water solid RCS can not accommodate the introduction of 6000 gpm from the RHR system. In addition, during cold shutdown the RHR system is required to be operable for RCS temperature control. The valve will be full-stroke exercised when the reactor cavity is being flooded at a refueling frequency.

4.11.2.1.2 Evaluation--The only flow path through this valve is into the RCS. This valve cannot be exercised during operation because the RHR pumps cannot develop sufficient head to overcome RCS pressure. It cannot be exercised during cold shutdowns as the required 6000 gpm flow rate could cause a low temperature overpressurization of the RCS. This valve cannot be tested at the Code required frequency without redesigning the system.

Based on the determination that the Code required testing is impractical, that the proposed alternate testing provides reasonable assurance of operational readiness, and considering the burden on the licensee if Code requirements were imposed, relief may be granted as requested.

4.12 Containment Spray System

4.12.1 Category A/C Valves

4.12.1.1 Relief Request. The licensee has requested relief from the quarterly exercising requirements of Section XI, Paragraph IWV-3521, for the supply to the containment spray ring headers check valves, CTS-131E, 131W, 127E, 127W, RH-141, and 142. The licensee has proposed to disassemble and inspect these valves on a sampling basis during refueling outages.

4.12.1.1.1 Licensee's Basis for Relief--These check valves are located in the supply lines to the containment spray ring headers. During normal plant operation, they are in the closed position. They are exposed to the containment atmosphere on the downstream side and are isolated from fluid pressure in the upstream side by closed motor operated valves. These valves cannot be exercised during power operation, cold shutdown, or refueling because flow through these valves would result in spraying the containment. This could cause problems with wet lagging, corrosion of components inside containment, ect. The only practical method of verifying operability of these check valves is by disassembly. These valves are identical is type and design, and operate at similar conditions and frequencies. Since the design conditions and size are sufficiently similar to warrant grouping them, the valves will be disassembled on a sample basis during refueling outages.

4.12.1.1.2 Evaluation--These valves cannot be stroked with flow without spraying the containment, which could cause equipment damage. Valve disassembly and inspection is generally an acceptable method for full-stroke exercising check valves. However, the licensee's testing must conform to the NRC staff positions on testing check valves by disassembly. The D.C. Cook IST program does not conform to these positions.

The NRC staff positions regarding check valve testing by disassembly are explained in detail in Generic Letter 89-04, "Guidance on Developing Acceptable Inservice Testing Programs". The applicable excerpts from this generic letter are included in Appendix D of this report.

Based on the determination that the Code required testing is impractical, considering the burden on the licensee, and on the condition that the D. C. Cook IST program is changed to conform to the NRC staff positions on sample disassembly and inspection, relief may be granted as requested.

4.12.2 Category C Valves

4.12.2.1 Relief Request. The licensee has requested relief from the quarterly exercising requirements of Section XI, Paragraph IWV-3521, for the

refueling water storage tank (RWST) to containment spray pumps' suction and discharge line check valves, CTS-138E, 138W, 103E, and 103W. The licensee has proposed to part-stroke these valves during containment spray pump testing and to disassemble and inspect the valves on a sampling basis during refueling outages.

4.12.2.1.1 Licensee's Basis for Relief--These check valves are located in the supply lines from the RWST to the containment spray pumps suction (CTS-138E & W) and the discharge line from the containment spray pumps (CTS-103E & W) to the ring header in containment. The valves cannot be full-stroke exercised during power operation, cold shutdown, or refueling without spraying the containment. These valves are identical in type, design, and operate at similar frequencies, flows, and temperatures. Since the design conditions and size are sufficiently similar to warrant grouping them, the valves will be disassembled during refueling on a sample basis.

4.12.2.1.2 Evaluation--These valves cannot be stroked with flow without spraying the containment, which could cause equipment damage. Valve disassembly and inspection is generally an acceptable method for full-stroke exercising check valves. However, the licensee's testing must conform to the NRC staff positions on testing check valves by disassembly. The D.C. Cook IST program does not conform to these positions.

The NRC staff positions regarding check valve testing by disassembly are explained in detail in Generic Letter 89-04, "Guidance on Developing Acceptable Inservice Testing Programs". The applicable excerpts from this generic letter are included in Appendix D of this report.

Based on the determination that the Code required testing is impractical, considering the burden on the licensee, and on the condition that the D. C. Cook IST program is changed to conform to the NRC staff positions on sample disassembly and inspection, relief may be granted as requested.

4.13 Ice Condenser Refrigeration

4.13.1 Category A/C Valves

4.13.1.1 Relief Request. The licensee has requested relief from the requirements of Section XI, Paragraph IWV-3521, quarterly exercising in the closed direction, for the glycol supply and return containment isolation check valves, R-156 and 157. The licensee has proposed full-stroke exercising these valves to the open position quarterly, and verifying closure by seat leakage testing per the Appendix "J" program at a refueling outage frequency.

4.13.1.1.1 Licensee's Basis for Relief--These check valves are installed in parallel lines to the glycol main supply and return lines mainly to relieve glycol thermal expansion. These valves and necessary test connections are located inside the containment. Due to plant design, the only method available to verify valve closure is leak testing. The valves are not equipped with position indication. The valves will be full-stroke exercised in the open direction quarterly and verified closed by seat leakage testing per Appendix "J" at a refueling frequency.

4.13.1.1.2 Evaluation--These are containment isolation check valves located inside containment and are, therefore, inaccessable during reactor operation. The only method available to verify valve closure is leak testing, which would require a containment entry. Testing these valves during cold shutdowns would result in increased radiation doses to plant personnel. Further, this would require a significant amount of time for test equipment setup, test performance, and test equipment removal and could, therefore, result in a delay in the return to power.

These valves recieve an Appendix "J", Type C, leak rate test during refueling outages which is equivalent to the Section XI leak rate testing requirements. The licensee's proposed testing conforms to an established NRC staff position which allows containment isolation check valves located inside the containment to be verified closed by leak rate testing at a refueling outage frequency per the Appendix "J" testing program.

Based on the determination that the proposed alternate testing would provide an acceptable level of quality and safety, relief may be granted as requested.

4.14 Control Room Ventilation

4.14.1 Category B Valves

4.14.1.1 Relief Request. The licensee has requested relief from the stroke timing requirements of Section XI, Paragraph IWV-3413, for the cooling water control valves, VRV-315 and 325. The licensee has proposed to verify operability by observation during normal air conditioning unit operation.

4.14.1.1.1 Licensee's Basis for Relief--These valves are located at the outlet of the control room air conditioner water pump. These three-way valves function to modulate water flow through the air handler package based on cooling requirements. These valves are demonstrated operable during normal control room air conditioning operation. The valves cannot be stroke timed because they are not equipped with position indication and stroke times are not repeatable.

4.14.1.1.2 Evaluation--These three-way control valves have no external operating mechanism and are not equipped with control switches or position indication. These valves modulate to control cooling water flow based on the system cooling requirements. Stroke times would not be meaningful or repeatable.

Based on the determination that the Code required testing is impractical, that the proposed alternate testing provides reasonable assurance of operational readiness, and considering the burden on the licensee if the Code requirements were imposed, relief may be granted as requested.

4.15 Emergency Diesel Generator System

4.15.1 Category B Valves

4.15.1.1 Relief Request. The licensee has requested relief from the stroke timing requirments of Section XI, Paragraph IWV-3413(b), for the diesel generator starting air valves, XRV-220, 225, 221, 226, 222, and 227. The licensee has proposed to detect valve degradation by measuring the diesel generator start times instead of measuring the stroke times of the valves.

4.15.1.1.1 Licensee's Basis for Relief--The starting air valves are installed on parallel air supply lines to a diesel generator. The valves are not equipped with position indication devices to directly measure valve stroke times. Stroke timing is verified by measuring diesel starting times (Technical Specification acceptance of ten seconds or less). The valves on a staggered basis are valved out one at a time to verify the operability of the opposite valve during diesel testing. The consistent compliance of the diesel generator start times (typically seven to nine seconds) demonstrates the valve performance. Position indication is confirmed during the above testing when only one starting air train is used to start the diesel generators. The starting air valves do not require or have a fail safe position because there is a redundant starting air supply system for each diesel generator. Similarly, stroke timing of jet assist valves XRV-220 and -225 are verified by measuring diesel starting times. The jet assist valve's fail safe position is "closed". The jet assist valve's function is to facilitate diesel generator quick start. Its failure to open upon a diesel start signal could cause the affected diesel generator to achieve operation conditions more slowly. Based on single failure criteria, the other diesel will start within the required ten seconds, thereby meeting system requirements. If this valve were to fail open, (open is the position to assist diesel generator starting) then the starting air reservoirs would bleed down, rendering that diesel generator inoperable. Therefore, in order to assure the starting air supply, the fail safe mode for this valve is closed.

4.15.1.1.2 Evaluation--It should be noted by the licensee that though the diesels have redundant starting air trains, redundancy of systems is not a reasonable basis for not performing component testing. If valves XRV-221, 222, 226, and 227 have required fail safe positions, then fail safe testing must be performed. It should also be noted that the function of Code required testing is to detect the degradation of system components; the required testing is not determined by single failure accident criteria. However, the diesel generator starting times would be directly impacted by the stroke times of these valves. Degradation of these valves would be seen by an increase in diesel generator start times provided each starting air train is tested separately by isolating the redundant starting air valves.

Based on the determination that the Code required testing is impractical, that the proposed alternate testing provides reasonable assurance of operational readiness, and considering the burden on the licensee if Code requirements were imposed, relief may be granted as requested on the condition that each starting air train is tested separately.

4.15.1.2 Relief Request. The licensee has requested relief from the exercising requirments of Section XI, Paragraph IWV-3411, for the diesel generator lube oil temperature control valves, QT-114-1AB (2AB) and 1CD (2CD). The licensee has proposed to verify proper operability during diesel generator testing.

4.15.1.2.1 Licensee's Basis for Relief--These valves are located at the discharge of the engine driven lube oil pump (diesel generator). These three-way thermostatic valves function to maintain the correct lube oil temperature by maintaining the correct proportion of oil flowing through the lube oil cooler and bypassing the lube oil cooler to maintain a preset lube oil temperature. We are requesting exemption from testing requirements since (1) these valves function only as regulating valves and not open/closed valves; (2) these valves are demonstrated operable during diesel generator testing. Diesel generators are tested every 31 days on a staggered basis per Technical Specification 4.8.1.1.2. These valves will be verified operable by observing proper temperatures during diesel testing.

4.15.1.2.2 Evaluation--These valves have no external operating mechanism and are not equipped with control switches or position indication. These valves modulate to control lube oil flow through the cooler based on system cooling requirements. Stroke times would not be meaningful or repeatable. Degradation of these valves would be evident during regular diesel generator testing, providing a reasonable assurance of valve operability.

Based on the determination that the Code required testing is impractical, that the proposed alternate testing provides reasonable assurance of operational readiness, and considering the burden on the licensee if Code requirements were imposed, relief may be granted as requested.

4.15.1.3 Relief Request. The licensee has requested relief from the exercising requirements of Section XI, Paragraph IWV-3411, for the diesel generator jacket water thermostatic control valves, QT-132-1AB (2AB) and 1CD (2CD). The licensee has proposed to verify proper operability of these valves during diesel generator testing.

4.15.1.3.1 Licensee's Basis for Relief--These valves are located at the discharge of the emergency diesel engine jacket water pump. These three-way thermostatic valves function to maintain the correct proportion of water flowing through the diesel engine water cooler and bypassing the diesel engine jacket water cooler to maintain a preset jacket water temperature. We are requesting exemption from the testing requirements since (1) these valves function only as regulation valves and not open/closed valves; (2) these valves are demonstrated operable during diesel generator testing. Diesel generators are tested on a staggered basis, every 31 days per Technical Specification 4.8.1.1.2.

4.15.1.3.2 Evaluation--These valves have no external operating mechanism and are not equipped with control switches or position indication. These valves modulate to control diesel jacket cooling water flow through the cooler based on system cooling requirements. Stroke times would not be meaningful or repeatable. Degradation of these valves would be

evident during regular diesel generator testing, providing reasonable assurance of valve operability.

Based on the determination that the Code required testing is impractical, that the proposed alternate testing provides reasonable assurance of operational readiness, and considering the burden on the licensee if Code requirements were imposed, relief may be granted as requested.

4.16 Compressed Air System

4.16.1 Category A/C Valves

4.16.1.1 Relief Request. The licensee has requested relief from the requirements of Section XI, Paragraph IWV-3521, quarterly exercising to the closed position, for containment isolation check valves, PA-343(342). The licensee has proposed to verify closure during the seat leakage testing per the Appendix "J" program at a refueling frequency.

4.16.1.1.1 Licensee's Basis for Relief--This check valve is located in the maintenance air supply line into the containment. The valve cannot be tested during power operation and cold shutdown because: 1) this line is generally isolated by removing a spool piece and inserting a blind flange, and 2) the valve and test connections are located inside the containment. The valve is not equipped with position indication. Due to the plant design, the only method available to verify the valve closure is leak testing. The valve will be verified closed during the seat leakage testing per Appendix "J" at a refueling frequency.

4.16.1.1.2 Evaluation--These are containment isolation check valves located inside containment and are, therefore, inaccessable during reactor operation. The only method available to verify valve closure is leak testing, which would require a containment entry. Testing these valves during cold shutdowns would result in increased radiation doses to plant personnel. Further, this would require a significant amount of time for test equipment setup, test performance, and test equipment removal and could, therefore, result in a delay in the return to power.

These valves recieve an Appendix "J", Type C, leak rate test during refueling outages which is equivalent to the Section XI leak rate testing requirements. The licensee's proposed testing conforms to an established NRC staff position which allows containment isolation check valves located inside the containment to be verified closed by leak rate testing at a refueling outage frequency per the Appendix "J" testing program.

Based on the determination that the proposed alternate testing would provide an acceptable level of quality and safety, relief may be granted as requested.

4.17 Waste Disposal Systems - Vent and Drains

4.17.1 Category A/C Valves

4.17.1.1 Relief Request. The licensee has requested relief from the requirments of Section XI, Paragraph IWV-3521, quarterly exercising to the closed position, for the nitrogen supply line containment isolation check valve, N-160. The licensee has proposed verifying closure of this valve during seat leakage testing per the Appendix "J" program at a refueling frequency.

4.17.1.1.1 Licensee's Basis for Relief--This containment isolation valve is located in the nitrogen supply line to the reactor coolant drain tank. This valve cannot be part- or full-stroke exercised due to lack of sufficient differential pressure to back seat the valve during power operation or cold shutdown. Due to the plant design, the only method available to verify the valve closure is leak testing. The valve is not equipped with position indication. The valve will be verified closed during seat leakage testing per Appendix "J" at a refueling frequency.

4.17.1.1.2 Evaluation--This is a containment isolation check valve located inside containment and is, therefore, inaccessable during reactor operation. The only method available to verify valve closure is leak testing, which would require a containment entry. Testing this valve during cold shutdowns would result in increased radiation doses to plant

personnel. Further, this would require a significant amount of time for test equipment setup, test performance, and test equipment removal and could, therefore, result in a delay in the return to power.

This valve recieves an Appendix "J", Type C, leak rate test during refueling outages which is equivalent to the Section XI leak rate testing requirements. The licensee's proposed testing conforms to an established NRC staff position which allows containment isolation check valves located inside the containment to be verified closed by leak rate testing at a refueling outage frequency per the Appendix "J" testing program.

Based on the determination that the proposed alternate testing would provide an acceptable level of quality and safety, relief may be granted as requested.

4.18 Post Accident Liquid and Gas Sampling

4.18.1 Category A/C Valves

4.18.1.1 Relief Request. The licensee has requested relief from the requirements of Section XI, Paragraph IWV-3521, quarterly exercising to the closed position, for the containment isolation check valve, SM-1. The licensee has proposed verifying closure of this valve during seat leakage testing per the Appendix "J" testing program at a refueling outage frequency.

4.18.1.1.1 Licensee's Basis for Relief--This containment isolation check valve for the containment radiation monitors' sample return cannot be full- or part-stroke exercised during power operation because these monitors are required to be operable in Modes 1, 2, 3, 4, and 6. The valve is not equipped with position indication. The valve is located in the open ended return line inside the containment. The only method available to verify the valve closure is leak testing. The valve will be tested during seat leakage testing per Appendix "J" at a refueling frequency.

4.18.1.1.2 Evaluation--This is a containment isolation check valve located inside containment and is, therefore, inaccessable during

reactor operation. The only method available to verify valve closure is leak testing, which would require a containment entry. Testing this valve during cold shutdowns would result in increased radiation doses to plant personnel. Further, this would require a significant amount of time for test equipment setup, test performance, and test equipment removal and could, therefore, result in a delay in the return to power.

This valve recieves an Appendix "J", Type C, leak rate test during refueling outages which is equivalent to the Section XI leak rate testing requirements. The licensee's proposed testing conforms to an established NRC staff position which allows containment isolation check valves located inside the containment to be verified closed by leak rate testing at a refueling outage frequency per the Appendix "J" testing program.

Based on the determination that the proposed alternate testing would provide an acceptable level of quality and safety, relief may be granted as requested.

APPENDIX A
VALVES TESTED DURING COLD SHUTDOWNS

APPENDIX A
VALVES TESTED DURING COLD SHUTDOWNS

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 in accordance with paragraph IWV-3412 and 3522 and are full-stroke exercised during cold shutdowns and refueling outages. All valves in this Appendix have been evaluated and the reviewer agrees with the licensee that testing these valves during power operation is not practical, due to the valve type, location, or system design. These valves should not be full-stroke exercised during power operation. These valves are listed below and grouped according to the system in which they are located.

1. MAIN STEAM

1.1 Category B Valves

MRV-210, 220, 230, and 240, main steam isolation valves, cannot be full-stroke exercised during power operation because this would require securing steam from a steam generator which could result in a reactor trip. Three loop operation is not allowed for D.C. Cook per Technical Specification 3.4.1.1. These valves will be part-stroke exercised quarterly by use of external hydraulics and full-stroke tested during hot standby (Mode 3) at a cold shutdown frequency.

2. FEEDWATER SYSTEM

2.1 Category B Valves

The following feedwater stop and feedwater regulating valves, cannot be exercised during power operation because closing these valves would require securing feed flow to the steam generator and partial-stroking may cause instability of the steam generator water level which could result in a reactor trip. Further, three loop operation is not allowed per D.C. Cook Nuclear

Plant Technical Specification 3.4.1.1. These valves will be full-stroke exercised during unit start-up or shutdown.

FMO-201	FMO-202	FMO-203	FMO-204
FRV-210	FRV-220	FRV-230	FRV-240

2.2 Category C Valves

FW-132-1, 2, 3, and 4, auxiliary feedwater (AFW) check valves, function to supply AFW to the steam generators when the AFW system is in operation. These check valves cannot be full- or part-stroke exercised during power operation without establishing AFW system flow through them and delivering cold water to the steam generators which could cause thermal shock to, and premature failure of, system components.. These valves will be full-stroke exercised during start-ups from cold shutdowns and refueling outages.

FW-138-1, 2, 3, and 4, auxiliary feedwater (AFW) check valves, function to supply AFW to the steam generators when the AFW system is in operation. These check valves cannot be full- or part-stroke exercised during power operation without establishing AFW system flow through them and delivering cold water to the steam generators which could cause thermal shock to, and premature failure of, system components. These valves will be full-stroke exercised when the plant is returned to power after a cold shutdowns and refueling outages.

3. CHEMICAL AND VOLUME CONTROL SYSTEM

3.1 Category A Valves

QCR-300 and 301, letdown line containment isolation valves, cannot be exercised during power operation because it would isolate letdown flow which could cause a loss of pressurizer level control and a plant shutdown. These valves will be full-stroke exercised at cold shutdowns and refueling outages.

QCM-250 and 350, reactor coolant pump seal water return isolation valves, cannot be exercised during power operation because it would interrupt reactor coolant pump seal water flow and could cause damage to the seals. These valves will be full-stroke exercised at cold shutdowns and refueling outages.

3.2 Category B Valves

QMO-200 and 201, are motor operated gate valves installed on the CVCS charging line to provide borated water for the reactor coolant system chemical shim control and reactor coolant system makeup. Isolation of this system would result in a loss of control of pressurizer level which could result in a reactor trip. These valves will be full-stroke exercised at cold shutdowns and refueling outages.

QMO-451 and 452, volume control tank isolation valves, cannot be exercised during power operation because it could result in a loss of pressurizer level control which could cause a reactor trip. The alternate suction source from the refueling water storage tank (RWST) cannot be used during power operation. RWST water contains a high concentration of boron which, when injected into the reactor, would cause reactivity, pressure, and temperature oscillations possibly resulting in a reactor trip. These valves will be full-stroke exercised at cold shutdowns and refueling outages.

QRV-200 is a control valve required for emergency boration in Modes 5 and 6. This valve is normally open to permit charging flow. This valve cannot be full-stroke tested during power operation because it would interrupt charging flow which could affect pressurizer level. This valve will be part-stroke exercised during power operation and full-stroke exercised at cold shutdowns and refueling outages.

QRV-251 is a control valve required for emergency boration in Modes 5 and 6. This control valve is normally open to permit charging flow when the centrifugal charging pumps are running. The valve cannot be full-stroke tested during power operation because it would interrupt both charging and seal water flow which could affect the pressurizer level and damage the reactor coolant pump seals. This valve will be part-stroke exercised during power operation and full-stroke exercised during cold shutdowns and refueling outages.

3.3 Category C Valves

CS-292 is a check valve in the emergency boration flow path from the boric acid system to the charging pump suction header. This valve cannot be exercised quarterly because establishing flow through this valve would cause a large negative reactivity insertion which could cause a reactor shutdown. This valve will be full-stroke exercised to the open position at a cold shutdown frequency.

4. COMPONENT COOLING

4.1 Category A Valves

CCM-451, 452, 453, 454, 458, and 459, containment isolation valves for component cooling water supply and return, cannot be tested during power operation without securing cooling water to the reactor coolant pumps. Isolation of these valves could cause the failure of the reactor coolant pumps. These valves will be full-stroke exercised at cold shutdowns and refueling outages.

CCR-455, 456, and 457, containment isolation valves for component cooling water to the reactor support coolers, cannot be tested during power operation without securing cooling water to the reactor support coolers. These valves must remain open to prevent overheating of the concrete around the reactor supports during the power operation. These valves will be full-stroke exercised at cold shutdowns and refueling outages.

5. EMERGENCY CORE COOLING

5.1 Category A Valves

ICM-250 and 251, containment isolation valves for the boron injection tank header to the cold legs, cannot be operated during normal plant operation without introducing boron into a non-heat traced line. Boron could crystallize and plug the line. These valves will be full-stroke exercised at cold shutdowns and refueling outages.

5.2 Category B Valves

IMO-261, safety injection pumps suction header isolation valve, cannot be tested when safety injection pumps are required to be operable. Testing would result in isolating the suction of both pumps, thereby rendering the entire system inoperable. This valve will be full-stroke exercised at cold shutdowns and refueling outages.

IMO-262, and 263, safety injection pumps recirculation line to the refueling water storage tank isolation valves, are required to remain open to provide pump protection when running at shut-off head. These valves cannot be exercised during normal operation because the failure of either valve in the closed position would make the safety injection pumps inoperable. These valves will be full-stroke exercised at cold shutdowns and refueling outages.

6. RESIDUAL HEAT REMOVAL

6.1 Category A Valves

ICM-129, normal return isolation valve from the reactor coolant system to the residual heat removal system for heatup and cooldown, is normally closed and cannot be operated during normal plant operation because it is interlocked to remain closed at reactor coolant system pressures above 450 psig. This valve will be full-stroke exercised at cold shutdowns and refueling outages.

6.2 Category B Valves

IMO-128, normal return isolation valve from the reactor coolant system to the residual heat removal system for heatup and cooldown, is normally closed and cannot be operated during normal plant operation because it is interlocked to remain closed at reactor coolant system pressures above 450 psig. This valve will be full-stroke exercised at cold shutdowns and refueling outages.

Normally closed residual heat removal and safety injection supply header valves to the reactor coolant system hot legs, IMO-315 and 325, and normally open residual heat removal and safety injection supply header valves to the

reactor coolant system cold legs, IMO-316 and 326, should not be exercised during power operation. Failure in a non-conservative position would result in less than the minimum number of injection flow paths for which credit is taken in the Final Safety Analysis Report. These valves will be full-stroke exercised at cold shutdowns and refueling outages.

6.3 Category A/C Valves

SI-151E and 151W, check valves in the residual heat removal supply lines to either the hot or cold legs, cannot be exercised during power operation because the residual heat removal pumps do not develop sufficient head to overcome reactor coolant system pressure. The only flow path through these valves is into the reactor coolant system. These valves will be full-stroke exercised at cold shutdowns and refueling outages.

RH-133 and 134 are check valves which function to circulate water from the residual heat removal pumps to the reactor coolant system when the residual heat removal system is aligned for heat removal operation. These valves cannot be exercised during power operation because the residual heat removal pumps do not develop sufficient head to overcome reactor coolant system pressure. The only flow path through these valves is into the reactor coolant system. These valves will be full-stroke exercised at cold shutdowns and refueling outages.

7. COMPRESSED AIR SYSTEM

7.1 Category A Valves

XCR-100, 101, 102, and 103, containment isolation valves in the control air supply lines, cannot be full-stroke tested during power operation without causing a loss of containment control air. Testing of these valves can potentially cause: 1) disruption of air flow to air operated valves in the containment; as a result, they would go to their fail-safe position, e.g., closed position for containment isolation valves, 2) systems to not perform their design function, i.e., termination of chemical and volume control system flow and change in reactor coolant system pressure and temperature, and

3) challenge to system safeguard protection which may result in a unit trip. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

8. BORON MAKEUP SYSTEM

8.1 Category C Valves

CS-427N (427S), a check valve in the emergency boration flow path, cannot be exercised during power operation because establishing flow through this valve would result in a large negative reactivity insertion and possibly a reactor shutdown. These valves will be full-stroke exercised during cold shutdowns and refueling outages.

9. POST ACCIDENT LIQUID SAMPLING PANEL

9.1 Category A Valves

ECR-36, a containment isolation valve in the return line of the lower containment radiation monitors, cannot be full- or part-stroke exercised during power operation or refueling because closure of the valve would isolate both radiation monitors which are required to be operable (Technical Specification Table 3.3-6) during power operation (Mode 1 through 4) and refueling (Mode 6). This valve will be full-stroke exercised during cold shutdowns.

APPENDIX B
P&ID FIGURE LIST

APPENDIX B

P&ID FIGURE LIST

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

Unit 1

SYSTEM	DRAWING NO.	REVISION
Main Steam System	1-5105	29
Main Steam System	1-5105B	35
Steam Generating System	1-5105D	1
Feedwater System	1-5106	35
Auxiliary Feedwater System	1-5106A	38
Essential Service Water System	1-5113	41
Nonessential Service Water System	1-5114A	31
Station Drainage, Containment	1-5124	22
Reactor Coolant System	1-5128	19
Reactor Coolant System	1-5128A	37
CVCS - Reactor Letdown and Charging	1-5129	31
CVCS - Reactor Letdown and Charging	1-5129A	19
Component Cooling System	1-5135	29
Component Cooling System	1-5135A	30
Component Cooling System	1-5135B	14
Nuclear Sampling System	1-5141	29
Nuclear Sampling System	1-5141A	32
Post Accident Sampling System-Containment Hydrogen	1-5141D	10
Emergency Core Cooling System-SIS	1-5142	25
Emergency Core Cooling System-RHR	1-5143	36
Containment Spray System	1-5144	28
Containment Penetration and Weld Channel Pressurization System	1-5145	17
Ice Condenser Refrigeration System	1-5146B	24
Containment Ventilation System	1-5147A	34
Control Room Ventilation System	1-5149	20

SYSTEM	DRAWING NO.	REVISION
Emergency Diesel Generator System "AB"	1-5151A	25
Emergency Diesel Generator System "AB"	1-5151B	28
Emergency Diesel Generator System "CD"	1-5151C	26
Emergency Diesel Generator System "CD"	1-5151D	28

Unit 2

SYSTEM	DRAWING NO.	REVISION
Main Steam System	2-5105B	42
Steam Generating System	2-5105D	2
Feedwater System	2-5106	34
Auxiliary Feedwater System	2-5106A	41
Essential Service Water System	2-5113	36
Nonessential Service Water System	2-5114A	27
Station Drainage, Containment	2-5124	20
Reactor Coolant System	2-5128	19
Reactor Coolant System	2-5128A	34
CVCS - Reactor Letdown and Charging	2-5129	32
CVCS - Reactor Letdown and Charging	2-5129A	20
Component Cooling System	2-5135	34
Component Cooling System	2-5135A	30
Component Cooling System	2-5135B	14
Nuclear Sampling System,	2-5141	27
Nuclear Sampling System	2-5141A	30
Post Accident Sampling System-Containment Hydrogen	2-5141D	8
Emergency Core Cooling System-SIS	2-5142	28
Emergency Core Cooling System-RHR	2-5143	35
Containment Spray System	2-5144	29
Containment Penetration and Weld Channel Pressurization System	2-5145	20
Ice Condenser Refrigeration System	2-5146B	23
Containment Ventilation System	2-5147A	35
Control Room Ventilation System	2-5149	23
Emergency Diesel Generator System "AB"	2-5151A	26

SYSTEM	DRAWING NO.	REVISION
Emergency Diesel Generator System "AB"	2-5151B	27
Emergency Diesel Generator System "CD"	2-5151C	26
Emergency Diesel Generator System "CD"	2-5151D	27

Units 1 & 2

SYSTEM	DRAWING NO.	REVISION
Makeup Water and Primary Water Systems	12-5115A	41
Compressed Air System	12-5120B	22
CVCS-Boron Makeup	12-5131	19
Spent Fuel Pit Cooling and Cleanup	12-5136	25
WDS-Vents and Drains	12-5137A	21
Post Accident Liquid and Gas Sampling	12-5141C	8
Post Accident Liquid Sampling Instrument Panel	12-5141F	6

APPENDIX C

IST PROGRAM ANOMALIES IDENTIFIED DURING THE REVIEW

APPENDIX C

IST PROGRAM ANOMALIES IDENTIFIED DURING THE REVIEW

Inconsistencies and omissions in the licensee's program noted during the course of this review are summarized below. The licensee should resolve these items in accordance with the evaluations, conclusions, and guidelines presented in this report.

1. Valves that cannot be exercised, or can only be part-stroke exercised, quarterly during power operation may be exercised on a cold shutdown frequency as allowed by Section XI. In this situation, a relief request is not required, however the licensee must submit, and have approved, a detailed technical justification for testing on a cold shutdown frequency. The D.C. Cook program contains "relief request notes" which are not specifically identified as cold shutdown justifications or relief requests.

2. The D.C. Cook IST program has designated valves with maximum limiting stroke times of up to 5 seconds as fast acting valves. The licensee has neither provided an explanation of what actions would be taken when the "Recommended Action Time" of their acceptance criteria is exceeded, nor explained why valves with stroke times between 2 seconds and 5 seconds should be considered fast acting valves. Further, the licensee has not provided a technical justification for their proposed alternate testing that demonstrates this testing provides a reasonable alternative to the Code requirements, and that degradation will be detected and corrective action taken prior to valve failure. Therefore, relief should not be granted. Refer to section 4.1.1 of this report.

3. The NRC staff positions regarding check valve testing by disassembly are explained in detail in Generic Letter 89-04, "Guidance on Developing Acceptable Inservice Testing Programs". The D.C. Cook IST program does not conform to these NRC staff positions.

Therefore, relief may be conditionally granted for the following valves provided compliance with these staff positions:

Valve	TER Section	Valve	TER Section
MS-108-2	4.2.1.1	MS-108-3	4.2.1.1
CS-292	4.7.3.1	SI-166-L1	4.11.1.1
SI-166-L2	4.11.1.1	SI-166-L3	4.11.1.1
SI-166-L4	4.11.1.1	SI-170-L1	4.11.1.4
SI-170-L2	4.11.1.4	SI-170-L3	4.11.1.4
SI-170-L4	4.11.1.4	CTS-131E	4.12.1.1
CTS-131W	4.12.1.1	CTS-127E	4.12.1.1
CTS-127W	4.12.1.1	RH-141	4.12.1.1
RH-142	4.12.1.1	CTS-138E	4.12.2.1
CTS-138W	4.12.2.1	CTS-103E	4.12.2.1
CTS-103W	4.12.2.1		

4. The licensee has provided justification for not verifying the reverse flow closure of check valves FW-118-1, 2, 3, and 4 during power operation and proposed to test them during refueling outages. However, the licensee has failed to provide adequate justification for not performing this testing during cold shutdowns. It may be impractical to verify valve closure during cold shutdowns, however, since the licensee has not adequately demonstrated the impracticality or undue burden of performing this testing or the equivalency of the alternate testing, relief should not be granted. Refer to section 4.3.1.1 of this report.

5. The NRC staff position regarding full flow testing of check valves is explained in detail in Generic Letter 89-04, "Guidance on Developing Acceptable Inservice Testing Programs". The quarterly test of check valves FW-134 and 135 passes 700 gpm through the valves which is 78% of the maximum required accident condition flow. Therefore, this test is a partial-stroke exercise of these valves and not a full-stroke exercise as stated by the licensee. The licensee has proposed to full-stroke exercise these valves during refueling outages. They have demonstrated the impracticality of full-stroke exercising during power operations, however they have not provided an adequate justification for not performing this testing during cold

shutdowns. It may be impractical to full-stroke exercise these valves during cold shutdowns, however, since the licensee has not adequately demonstrated the impracticality or undue burden of performing this testing or the equivalency of the alternate testing, relief should not be granted. Refer to note 3(2) of the relief request notes for flow diagram no. 1(2)-5106A in Revision 2 of the D. C. Cook IST program.

6. The NRC staff position regarding containment isolation valve testing is explained in Generic Letter 89-04. Testing containment isolation valves in accordance with the requirements of 10 CFR 50, Appendix J, and Section XI, IWV-3426 and 3427(a), is acceptable. Since this position represents a deviation from the Code requirements, it should be documented in the IST program.

7. The licensee has not provided sufficient justification for not testing the following valves at a cold shutdown frequency, and therefore relief should not be granted. Testing these vent valves during cold shutdowns typically has not been a problem at other reactor facilities. The licensee has not identified the uniqueness of their design which makes cold shutdown testing impractical rather than just an inconvenience. Refer to sections 4.6.2.1 and 4.6.2.2 of this report.

NSO-021	NSO-022	NSO-023	NSO-024
NSO-061	NSO-062	NSO-063	NSO-064

8. The licensee has provided no justification for not testing valve SI-189 to the open position as required by the Code. Relief may be granted from the Code requirement to test to the closed position quarterly or during cold shutdowns. However, the licensee should test to the open position in accordance with the Code requirements. Refer to section 4.6.1.3 of this report.

9. The licensee has not provided sufficient technical justification for not fail-safe testing and stroke timing valves QRV-200 and 251,

nor has the licensee proposed any alternate testing. The licensee should therefore test these valves in accordance with Code requirements. Refer to section 4.7.1.1 of this report.

10. The licensee lists the testing being performed on valves SI-170 L1, L2, L3, and L4 as note 6. Note 6 is the relief request from exercising valves SI-161 L1, L2, L3, and L4. This discrepancy should be corrected.

11. The licensee has requested that relief be granted to allow testing of valves RH-108 E and 108 W at a cold shutdown frequency. Relief is not required to perform the Code required testing at a cold shutdown frequency, however, the licensee's technical justification is not sufficient to allow its approval as a cold shutdown justification. The licensee has provided no explanation as to why the 8" recirculation line to the refueling water storage tank cannot be used for testing. The Code required testing must be performed unless the licensee provides a detailed technical justification explaining why the required testing cannot be performed quarterly during power operation.

12. The licensee should evaluate whether valves XRV-221 and 222 have a required safety related fail safe position. If they do, then fail-safe testing must be performed.

13. Section XI requires that valves with fail-safe actuators be tested by observing the operation of the valves upon loss of actuator power. The licensee has requested relief from stroke timing and fail-safe testing component cooling water valve CRV-470. However, the licensee has not demonstrated the impracticality of removing actuator power (in this case air) and observing the operation of this valve. This valve must, therefore, be fail-safe tested in accordance with Code requirements. Refer to section 4.8.1.1 of this report.

14. The licensee has failed to provide sufficient technical justification for not testing valves ESW-109 (145), 115 (240), and 243 at cold shutdowns. Therefore, relief should be denied. Refer to section 4.4.1.1 of this report.

15. The D. C. Cook IST program valve table lists valves IMO-330, 331, 340, and 350 as being tested quarterly in accordance with Section XI. The licensee requested relief from quarterly testing requirements in letters to the NRC dated October 31, 1986 and November 20, 1987, and the licensee was granted interim relief. Additionally, this relief request should be included in the IST program.

16. The licensee has committed to disassembly and inspection of diesel generator cooling from essential service water check valves, ESW-111 (141), 112 (142), 113 (143), and 114 (144), on a refueling outage frequency in response to IE Bulletin 83-03. The Safety Evaluation Report dated September 4, 1985 stipulates that the licensee must include this testing, as well as the quarterly forward flow test, in the IST program. Because disassembly and inspection at a refueling frequency to verify valve operability is a deviation from Section XI testing requirements, the licensee must submit a relief request for this testing.

17. Lack of installed instrumentation is not a sufficient long term justification for not measuring Code required parameters. Therefore, relief from measuring the flow of the spent fuel cooling pit pumps should be denied.

APPENDIX D

EXCERPTS FROM NRC GENERIC LETTER NO. 89-04

GUIDANCE ON DEVELOPING ACCEPTABLE INSERVICE TESTING PROGRAMS

APPENDIX D

EXCERPTS FROM NRC GENERIC LETTER NO. 89-04

GUIDANCE ON DEVELOPING ACCEPTABLE INSERVICE TESTING PROGRAMS

The following are NRC staff positions, or staff approved alternatives, regarding Code requirements. These are excerpts from Attachment 1, "Potential Generic Deficiencies Related to IST Programs and Procedures", of Generic Letter 89-04, dated April 3, 1989.

1. Full Flow Testing of Check Valves.

Section XI of the ASME Code requires check valves to be exercised to the positions in which they perform their safety functions. A check valve's full-stroke to the open position may be verified by passing the maximum required accident condition flow through the valve. This is considered by the staff as an acceptable full-stroke. Any flow rate less than this will be considered a partial-stroke exercise. A valid full-stroke exercise by flow requires that the flow through the valve be known. Knowledge of only the total flow through multiple parallel lines does not provide verification of flow rates through the individual valves and is not a valid full-stroke exercise.

Full flow testing of a check valve as described above may be impractical to perform for certain valves. It may be possible to qualify other techniques to confirm that the valve is exercised to the position required to perform its safety function. To substantiate the acceptability of any alternative technique for meeting the ASME Code requirements, licensees must as a minimum address and document the following items in the IST program:

1. The impracticality of performing a full flow test,

2. A description of the alternative technique used and a summary of the procedures being followed,

3. A description of the method and results of the program to qualify the alternative technique for meeting the ASME Code,

4. A description of the instrumentation used and the maintenance and calibration of the instrumentation,

5. A description of the basis used to verify that the baseline data has been generated when the valve is known to be in good working order, such as recent inspection and maintenance of the valves internals, and

6. A description of the basis for the acceptance criteria for the alternative testing and a description of corrective actions to be taken if the acceptance criteria are not met.

An acceptable alternative to this full-stroke exercising requirement is stated in position 2 below.

2. Alternative to Full Flow Testing of Check Valve.

The most common method to full-stroke exercise a check valve open (where disk position is not observable) is to pass the maximum required accident flow through the valve. However, for some check valves, licensees cannot practically establish or verify sufficient flow to full-stroke exercise the valves open. Some examples of such valves are, in PWRs, the containment spray header check valves and combined LPSI and safety injection accumulator header check valves and, in BWRs, the HPCI or RCIC check valves in the pump suction from the suppression pool. In most commercial facilities, establishing design accident flow through these valves for testing could result in damage to major plant equipment.

The NRC staff position is that valve disassembly and inspection can be used as a positive means of determining that a valve's disk will full-stroke exercise open or of verifying closure capability, as permitted by IWV-3522. If possible, partial valve stroking quarterly or during cold shutdowns, or after reassembly must be performed.

The staff has established the following positions regarding testing check valves by disassembly:

a. During valve testing by disassembly, the valve internals should be visually inspected for worn or corroded parts, and the valve disk should be manually exercised.

b. due to the scope of this testing, the personnel hazards involved and system operating restrictions, valve disassembly and inspection may be performed during reactor refueling outages. Since this frequency differs from the Code required frequency, this deviation must be specifically noted in the IST program.

c. Where the licensee determines that it is burdensome to disassemble and inspect all applicable valves each refueling outage, a sample disassembly and inspection plan for groups of identical valves in similar applications may be employed. The NRC guidelines for this plan are explained below:

The sample disassembly and inspection program involves grouping similar valves and testing one valve in each group during each refueling outage. The sampling technique requires that each valve in the group be the same design (manufacturer, size, model number, and materials of construction) and have the same service conditions including valve orientation. Additionally, at each disassembly the licensee must verify that the disassembled valve is capable of full-stroking and that the internals of the valve are structurally sound (no loose or corroded parts). Also, if the disassembly is to verify the full-stroke capability of the valve, the disk should be manually exercised.

A different valve of each group is required to be disassembled, inspected, and manually full-stroke exercised at each successive refueling outage, until the entire group has been tested. If the disassembled valve is not capable of being

full-stroke exercised or there is binding or failure of the valve internals, the remaining valves in that group must also be disassembled, inspected, and manually full-stroke exercised during the same outage. Once this is completed, the sequence of disassembly must be repeated unless extension of the interval can be justified.

Extending the valve sample disassembly and inspection interval from disassembly of one valve in the group every refueling outage or expanding the group size would increase the time between testing of any particular valve in the group. With four valves in a group and an 18-month reactor cycle, each valve would be disassembled and inspected every six years. If the fuel cycle is increased to 24 months, each valve in a four-valve sample group would be disassembled and inspected only once every 8 years.

Extension of the valve disassembly/inspection interval from that allowed by the Code (quarterly or cold shutdown frequency) to longer than once every 6 years is a substantial change which may not be justified by the valve failure rate data for all valve groupings. When disassembly/inspection data for a valve group show a greater than 25% failure rate, the licensee should determine whether the group size should be decreased or whether more valves from the group should be disassembled during every refueling outage.

Extension of the valve disassembly/inspection interval to one valve every other refueling outage or expansion of the group size above four valves should only be considered in cases of extreme hardship where the extension is supported by actual in-plant data from previous testing. In order to support extension of the valve disassembly/inspection intervals to longer than once every 6 years, licensees should develop the following information:

a. Disassemble and inspect each valve in the valve grouping and document in detail the condition of each valve and the valve's capability to be full-stroked.

b. A review of industry experience, for example, as documented in NPRDS, regarding the same type of valve used in similar service.

c. A review of the installation of each valve addressing the "EPRI Applications Guidelines for Check Valves in Nuclear Power Plants" for problematic locations.

3. Back Flow Testing of Check Valves.

Section XI requires that Category C check valves (valves that are self actuated in response to a system characteristic) performing a safety function in the closed position to prevent reversed flow, be tested in a manner that proves that the disk travels to the seat promptly on cessation or reversal of flow. In addition, for Category A/C valves (valves that have a specified leak rate limit and are self actuated in response to a system characteristic), seat leakage must be limited to a specific maximum amount in the closed position for fulfillment of their function. Verification that a Category C valve is in the closed position can be done by visual observation, by an electrical signal initiated by a position-indicating device, by observation of appropriate pressure indication in the system, by leak testing, or by other positive means.

Examples of ASME Code Class check valves that perform a safety function in the closed position that are frequently not back flow tested are:

a. main feedwater header check valves
b. pump discharge check valves on parallel pumps
c. keep full check valves
d. check valves in steam supply lines to turbine driven AFW pumps
e. main steam non-return valves
f. CVCS volume control tank outlet check valves

4. Stroke Time Measurements for Rapid-Acting Valves.

The Code requires the following for power operated valves with stroke times 10 seconds or less: (a) Limiting values of full-stroke times shall

be specified [IWV-3413(a)], (b) Valve stroke times shall be measured to (at least) the nearest second [IWV-3413(b)], and (c) If the stroke time increases by 50% or more from the previous test, then the test frequency shall be increased to once each month until corrective action is taken [IWV-3417(a)]. Paragraph IWV-3417(b) specifies corrective actions that must be taken.

With reference to (c) above, measuring changes in stroke times from a reference value as opposed to measuring changes from the previous test is an acceptable (and possibly better), alternative to the staff. However, since this is different from the Code requirement, this deviation should be documented in the IST program.

Most plants have many power operated valves that are capable of stroking in 2 seconds or less such as small solenoid operated valves. Licensees encounter difficulty in applying the Code required 50% increase of stroke time corrective action requirements for these valves. The purpose of this requirement is to detect and evaluate degradation of a valve. for valves with stroke times in this range, much of the difference in stroke times from test to test comes from inconsistencies in the operator or timing device used to gather the data. These differences are compounded by rounding the results as allowed by the Code. Thus, the results may not be representative of actual valve degradation.

The following discussion illustrates the problem that may exist when complying with the Code requirements for many of these rapid-acting valves:

> A valve may have a stroke time of 1.49 seconds during one test and a stroke time during the following test of 1.51 seconds. If stroke times are rounded to the nearest second as allowed by the Code, the difference between these tests would exceed the 50% criteria and would require an increased frequency of testing until corrective action is taken. This can result from a stroke time difference of 0.02 seconds, which is usually not indicative of significant valve degradation.

Power operated valves with normal stroke times of 2 seconds or less are referred to by the staff as "rapid-acting valves." Relief may be granted from the requirements of Section XI, Paragraph IWV-3417(a) for these valves provided the licensee assigns a maximum limiting value of full-stroke time of 2 seconds to these valves and, upon exceeding this limit, declares the valve inoperable and takes corrective action in accordance with IWV-3417(b).

An acceptable alternative to the Code stroke timing requirements is the above stated rapid-acting valve position. Since this represents a deviation from the Code requirements, it should be specifically documented in the IST program.