UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO INSERVICE TESTING PROGRAM AND REQUESTS FOR RELIEF

DUQUESNE LIGHT COMPANY

OHIO EDISON COMPANY

PENNSYLVANIA POWER COMPANY

BEAVER VALLEY POWER STATION, UNIT NO. 1

DOCKET NO. 50-334

1.0 INTRODUCTION

The Code of Federal Regulations, 10 CFR 50.55a, requires that inservice testing (IST) of certain ASME Code Class 1, 2, and 3 pumps and valves be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable addenda, except where relief has been granted or proposed alternatives have been authorized by the Commission pursuant to 50.55a(f)(6)(i), 50.55a(a)(3)(i), or 50.55a(a)(3)(ii). In requesting relief or proposing an alternative, the licensee must demonstrate that: (1) the code requirement is impractical for its facility; (2) the proposed alternative provides an acceptable level of quality and safety; or (3) compliance would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety. NRC guidance contained in Generic Letter (GL) 89-04, Guidance on Developing Acceptable Inservice Testing Programs, provided alternatives to the Code requirements determined to be acceptable to the staff and authorized the use of the alternatives in Positions 1, 2, 6, 7, 9, and 10 with the provision that the licensee follow the guidance delineated in the applicable position. When an alternative is proposed which is in accordance with GL 89-04 guidance and is documented in the IST program, no further evaluation is required; however, implementation of the alternative is subject to NRC inspection.

The Code of Federal Regulations, Section 50.55a authorizes the Commission to grant relief from ASME Code requirements or to approve proposed alternatives upon making the necessary findings. The NRC staff's findings with respect to granting or not granting the relief requested or authorizing the proposed alternative as part of Duquesne Light Company's (the licensee's) IST program are contained in this Safety Evaluation (SE).

The Beaver Valley Power Station, Unit 1, IST Program was developed in accordance with the 1983 Edition, through Summer 1983 Addenda, of ASME Section XI. This SE concerns relief requests and supporting information that were submitted by letters dated August 18, 1992, and September 25, 1992, for

the Beaver Valley Power Station, Unit 1, IST program. The IST program included in the September 25, 1992, submittal generally incorporates the information included in the August 18, 1992, submittal, which provided the licensee's response to 29 anomalies identified in NRC's SE dated May 6, 1991, supplemented by an SE dated January 24, 1992. The attached Table of Anomalies details each of the anomalies, discusses the actions taken to address the concerns, and provides the current status of relief requests related to anomalies and any remaining outstanding actions. New or revised relief requests, other than as indicated acceptable in the table, are evaluated below.

2.0 RELIEF REQUEST VRR-27

As identified in Anomaly 21 of the May 6, 1991, SE, interim relief was granted for 1 year or until the next refueling outage, whichever is longer. The August 18, 1992, submittal included a revised relief request which addressed the anomaly relating to a maximum leak rate for testing two containment isolation valves in parallel. Outside containment-isolation valves, TV-CC-110F1 and 110F2 (cooling water return from the containment air-recirculation cooling coils to the chilled water and river water systems) are a Category A passive 8-inch globe valve and a Category A active 8-inch globe valve, respectively. The requirements of IWV-3426 and IWV-3427(a) specify that a leakage limit for each valve be established.

2.1 Licensee's Basis for Relief

The licensee states: "As shown on the attached figure (figure not included in SE) for Penetration #11, the configuration of this containment penetration (i.e., two outside containment isolation valves in parallel) is such that individual leakage rates for each specific valve cannot be determined using the test method of 10 CFR 50, Appendix J. The boundary valve downstream from TV-CC-110F1 is a potentially open check valve leading to the circulating water system. The river water system downstream of TV-CC-110F1, therefore, cannot be isolated to provide an accurate leakage rate from TC-CC-110F2.

In this case, assigning individual leakage rates is not practical. Therefore, a maximum permissible leakage rate will be assigned to the entire penetration. The maximum rate assigned to the penetration, however, will be conservatively set at the value normally assigned to just one 8-inch isolation valve."

2.2 Alternative Testing

The licensee proposes: "Assign a maximum permissible leakage rate for the entire barrier to then be used as the criteria for initiating corrective action in accordance with IWV-3427(a)."

2.3 Evaluation

In rulemaking effective September 8, 1992, the NRC approved the 1989 Edition of ASME Section XI. The rules for inservice testing of valves referenced in the 1989 Edition of Section XI, Subsection IWV, are OM-10, Inservice Testing of Valves in Light-Water Reactor Power Plants. The rulemaking indicates that

the staff took exception to the OM-10 requirements for containment isolation valves (CIVs) and imposed the requirements of ¶ 4.2.2.3, "Leakage Rate for Other Than Containment Isolation Valves," for CIVs. Paragraph 4.2.2.3(e), "Analysis of Leakage Rates," specifies that "leakage rate measurements shall be compared with the permissible leakage rates specified by the plant Owner for a specific valve or valve combination." The licensee's proposal is in accordance with the requirements of OM-10, Paragraph 4.2.2.3(e). Prior editions of Section XI did not address leak testing of valve combinations. The design configuration of the subject valves does not allow for individual leakage rate determination. Therefore, it is impractical to meet the requirements of Section XI, IWV-3426 and IWV-3427(a) for the applicable valves. However, the licensee has proposed leakage testing the penetration and assigning a maximum leakage limit to the valve combination based on a the allowable limit for a single 8-inch valve. The proposed method is in compliance with OM-10, ¶ 4.2.2.3(e) for leakage rate analysis, which has been approved by the staff and will provide assurance of the operational readiness of the valves. Imposition of the requirements of Section XI would be a burden on the licensee based on the modifications that would be required to facilitate individual valve leakage determination. The modifications would not be required under the latest Code edition as referenced in § 50.55a.

2.4 Conclusion

Relief is granted to leak test these valves in parallel pursuant to 10 CFR 50.55a(f)(6)(i) based on the impracticality of the design to facilitate testing and the burden if the requirements were imposed. The proposed alternative testing provides assurance of the operational readiness of the parallel valves for leaktight integrity of the containment and is in compliance with the requirements specified in OM-10, ¶ 4.2.2.3(e).

3.0 RELIEF REQUEST VRR-43

Relief Request VRR-43 concerns the quarterly exercise and stroke timing of six Class 3 solenoid operated valves (SOVs) that function to control the power operated relief valves (PORVs). The PORVs perform a safety function to provide overpressure relief when the plant is in a low-temperature mode of operation (low-temperature overpressurization - LTOP). LTOP was designated as Unresolved Safety Issue A-26 in 1978 (NUREG-0371). Staff guidance related to inservice testing and technical specifications for the PORVs was provided in NRC Generic Letter 90-06, Resolution of Generic Issue 70, "Power-operated Relief Valve and Block Valve Reliability," and Generic Issue 94, "Additional Low-Temperature Overpressure Protection for Light-Water Reactors," pursuant to 10 CFR 50.54(f).

3.1 Licensee's Basis for Relief

The licensee states: "These series SOVs are located inside the subatmospheric containment building and do not have position indication. There are no individual control switches or lights associated with the valves. Individual operation of these valves can only be monitored by locally disconnecting a lead for one of the SOVs and observing the PORV stroke. The SOV stroke cannot be timed directly, because the valves cannot be stroked without stroking the

PORVs, relief is requested from quarterly full or part stroke and time testing at power. In addition, stroking the SOVs associated with the low-temperature overpressure protection system cannot be performed while it is in service; therefore, relief from cold shutdown stroke and time testing is also requested."

3.2 Alternative Testing

The licensee proposes: "A refueling frequency test procedure will be developed to individually stroke the SOVs open and closed. The valve stroke time will be indirectly measured by timing the PORV stroke. An acceptable PORV stroke time will indicate an acceptable SOV stroke time."

3.3 Evaluation

The intent of stroke time measurements for power operated valves in accordance with IWV-3400 is to allow for determination of degrading conditions. If a valve experiences an increase in stroke time, particularly in solenoid valves, internal sticking or binding could be indicated and corrective actions could be initiated prior to a condition which results in the valve being inoperable. Section XI requires the testing of power operated valves be performed quarterly or during cold shutdown. OM-10, ¶ 4.2.1.2, allows extension of the frequency to during refueling outages when testing is impractical quarterly and during cold shutdown conditions.

The subject SOVs cannot be exercised and stroke-timed directly due to limitations of the design. There are no individual control switches or position indicating lights. However, during refueling outages, each individual valve can be controlled by lifting an electrical control lead. This will cause the associated PORV to stroke which verifies that the individual SOV stroked to control air to the PORV. Measuring the PORV stroke time provides an indirect indication of the stroke time of the SOV which will allow for monitoring the condition of the valves. This test method, while not direct, does meet the intent of the Code. The testing cannot be performed quarterly during power operations because a plant transient would result. Testing during cold shutdown conditions is not practical because the valves function in the low-temperature overpressure protection system which is required to remain operational during cold shutdown conditions. Performance of the test requires the PORVs and the SOVs to be inoperable. Therefore, the only practical plant condition for performing the test is during refueling outages when the PORVs are not required to be operable. Imposition of the Code requirements would be a burden in that the licensee could be forced to perform the testing during a plant condition that is prohibited by the plant safety analysis or to modify the system to enable monitoring the position of the check valve disks.

3.4 Conclusion

Relief is granted for extending the test frequency and utilizing an indirect method for measuring stroke time for the subject solenoid operated valves pursuant to 10 CFR 50.55a(f)(6)(i) based on the impracticality, due to limitations of design, of performing the testing in accordance with the Code

requirements, the burden on the licensee if the requirements were imposed, and consideration that the proposed testing method and frequency provide assurance of the operational readiness of the valves and generally meet the intent of the Code (test method) and frequency of OM-10.

4.0 RELIEF REQUEST VRR-44

This relief request relates to the quarterly full stroke exercise of the Class 3 Category A/C PORV air supply isolation check valves. These valves are 3/4" check valves which have a safety function to close. They are not required to open to fulfill a safety function.

4.1 Licensee's Basis for Relief

The licensee states: "The safety function of these valves is to close on loss of instrument air to allow the back-up nitrogen accumulators to supply the control air system for the PORVs. These check valves are located inside the reactor containment building and valve closure can only be checked by a leak test."

4.2 Alternative Testing

The licensee proposes: "Valve closure is verified by leakage testing during refueling outages."

4.3 Evaluation

The test frequency for the subject valves must be based on the requirements for PORV operability. During power operation, the leakage test cannot be performed because the valves are not accessible (inside reactor building). During cold shutdown conditions, the PORVs are required to remain operable for functioning in the low-temperature overpressurization mode. Therefore, refueling is the only plant condition that allows for the subject valves to be leak tested to verify closure capability. OM-10 ¶ 4.3.2.2 specifies the acceptable exercising frequencies for check valves and allows for exercising, or in this case verification of closure by leakage testing, to be deferred to refueling outages if it is impractical to perform during power operations or cold shutdown conditions. Therefore, the licensee's proposed test frequency is consistent with OM-10.

Testing during power operations is impractical due to the location of the valves because the only available test method requires access to the valves. Testing during cold shutdown conditions could impact the operability of the PORV and is, therefore, impractical based on operational limitations and concerns. Imposition of the Code requirements would be a burden because the test frequency could only be implemented if modifications were made to the air supply system for the PORV.

4.4 Conclusion

Relief is granted for extending the test interval for the PORV air supply isolation check valves pursuant to 10 CFR 50.55a(f)(6)(i) based on the impracticality of performing the testing at the Code required frequency, the burden if the requirements were imposed, and in consideration that the proposed test frequency conforms with the requirements of OM-10 and provides assurance of the operational readiness of the valves to close.

5.0 RELIEF REQUEST PRR-11

The licensee has requested relief for various pumps to allow utilization of pump curves for performing testing and establishing acceptance criteria. The use of pump curves has not been addressed in Section XI or in OM-6, Inservice Testing of Pumps in Light-Water Reactor Power Plants. The licensee has based their justification for relief on the premise that using pump curves provides an equivalent level of quality and safety in trending pump performance and degradation. The staff does not agree with this conclusion. Therefore, the relief request, as written, cannot be approved. If the licensee determines that for certain pumps, testing in accordance with the Code is impractical, specific relief should be requested describing the impracticalities of performing testing at a reference value of flow or differential pressure and the related burden. In the relief request, the licensee should discuss the following guidance related to using pump curves:

(1) Curves are developed, or manufacturer's pump curves are validated, when the pumps are known to be operating acceptably.

(2) The reference points used to develop or validate the curve are measured using instruments at least as accurate as required by the Code.

(3) Curves are based on an adequate number of points, with a minimum of five.

(4) Points are beyond the "flat" portion (low flow rates) of the curves in a range which includes or is as close as practicable to design basis flow rates.

(5) Acceptance criteria based on the curves does not conflict with Technical Specifications or Facility Safety Analysis Report operability criteria, for flow rate and differential pressure, for the affected pumps.

(6) If vibration levels vary significantly over the range of pump conditions, a method for assigning appropriate vibration acceptance criteria should be developed for regions of the pump curve.

(7) When the reference curve may have been affected by repair, replacement, or routine service, a new reference curve shall be determined or the previous curve revalidated by an inservice test.

6.0 GENERAL PROGRAM

During the review, the following items were noted that may require action by the licensee.

6.1 When to Declare a Valve Inoperable

The valve inservice testing program includes an apparent inconsistency in Section IV.A.2.e., Category A and P[illegible]s, and IV.B.5., Category C check valves. Section IV.A.2 states tha[illegible]s to exhibit the required change of valve stem or disk posit[illegible] specified ASME limiting value of full-stroke time, the valve [illegible]red inoperable immediately and an evaluation of the valve's cond[illegible] respect to system operability and technical specification shall by made[illegible]." Section IV.A.2.e contradicts this general statement by stating that "If the valve is not covered by any technical specifications and the condition of the valve cannot be corrected within 24 hours, then the valve shall be declared inoperable per ASME." A similar discrepancy exists in the check valve section for a failure to exhibit the required change of disk position.

The position stated in the general sections for declaring a valve inoperable immediately upon demonstration of exceeding its stroke time, or failing to exhibit the required change of disk position for a check valve, is correct and is in accordance with the guidance given in GL 89-04, Position 8, "Starting Point for Time Period in TS ACTION Statements." The guidance states that "it is the staff's position that as soon as the data is recognized as being within the Required Action Range for pumps or exceeding the limiting value of full-stroke time for valves, the associated component must be declared inoperable and the TS ACTION time must be started." However, this statement was not meant to imply that valves which are not covered by TS are not required to be declared inoperable when test data exceeds established acceptance limits of Section XI. It appears that the licensee has differentiated between valves covered by technical specifications and valves not covered by technical specifications. There should be no distinction other than that the inoperable condition of certain valves would not require entry into a TS ACTION statement. The statements included in the referenced sections of the IST Program appear to require the following action for valves not covered by TS which fail to meet the inservice testing acceptance criteria:

(1) Declare valve inoperable immediately.

(2) If not covered by TS and condition cannot be corrected within 24 hours. declare the valve inoperable.

As written, the valve would be declared inoperable twice. The discrepancy should be corrected.

6.2 Including Procedure Numbers in Relief Requests

The content of the relief requests could be enhanced by providing additional information in the "Basis for Relief" sections. Additionally, in the "Alternative Testing" sections, the licensee often states simply that the

testing will be performed in accordance with XXX-NNN procedure. For example, in Relief Request VRR-17, the "Alternate Test" is stated as follows: Full-stroke exercised open per 1OST-11.14 during refueling outages. Because the staff does not have copies of the test procedures, and these procedures are not provided as part of the inservice testing program, it is inappropriate to include these as references in relief requests. However, including test procedure numbers in the pump and valve tables is acceptable because the reference provides information necessary to determine which procedure performs the applicable test.

Rather than include references to test procedures in the relief requests, a description of the test method implemented by that procedure should be included. The information would be much more useful to the NRC in reviewing and evaluating the relief requests.

6.3 Recommendations Regarding Information to Include in Relief Requests

The staff believes that with the recent approval of OM-6 and OM-10, the number of relief requests will decrease, thereby reducing the overall burden on both the licensee's and NRC staffs. However, the staff notes that there are several improvements DLC could incorporate in future relief requests that could further staff review.

- The relief requests do not specify the applicable system name or number. The component lists in the IST Program are sorted by system number. It would be useful to include this information in the relief requests.

- References to particular documents (other than test procedures as discussed above) should include the name of the document. For example, Relief Request VRR-32 references IE Bulletin 83-03. While this information can be readily retrieved, for completeness, the licensee should include the title of the bulletin and explain the purpose of referencing it in the relief request.

- Other than test procedures, the licensee includes references to technical manuals. For example, in Relief Request VRR-30, the "Alternative Test" is stated as follows: Maintenance is to disassemble and inspect one valve per refueling outage per 1CMP-75-CRANE CHECK-1M. Without this document, the information is of no use to the staff in reviewing the relief request. For implementing a disassembly and inspection program, the licensee should follow the guidance in Generic Letter (GL) 89-04, Position 2. The appropriate statement for facilitating staff review, for example, would be as follows: A disassembly and inspection program will be utilized to verify the full-stroke capability of these valves. The program will be implemented in accordance with the guidance in Position 2 of GL 89-04, "Guidance on Developing Acceptable Inservice Testing Programs." Based on the alternative testing conforming with the guidance delineated in Position 2, the relief is approved per GL 89-04.

- Reduced drawings or system schematics are included for several of the relief requests. These types of drawings should be included for all of the relief requests, if possible, to enhance the quality and completeness of the document.

6.4 Program Items

- Relief Request VRR-7 lists valves TV-CH-F200A/B/C. Pages 59 and 60 of the IST Program list these valves as TC-CH-200A/B and TV-CH-200C.

- The IST Program valve list could be enhanced by including the function of each valve and the type of actuator.

- Relief Request VRR-27 includes both valves TV-CC110F1/F2. The valve table lists VRR-27 for valve 110F1, but not for valve 110F2. If valve 110F2 is individually leak tested, it should be removed from VRR-27.

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Attachment: Table of Anomalies

Date: December 30, 1992

TABLE OF ANOMALIES
SAFETY EVALUATION
INSERVICE TESTING PROGRAM
BEAVER VALLEY POWER STATION, UNIT 1

Anomaly	Description of Anomaly (May 6, 1991 SE)	DLC's Actions to Address Anomaly	Outstanding Actions
1. PRR-1	The licensee requested to measure vibration velocity instead of vibration displacement for all pumps in the IST program except residual heat removal and low head safety injection pumps. The licensee requested to discontinue annual bearing temperature measurements on these same pumps. The proposal to monitor pump vibration velocity in lieu of displacement and annual bearing temperature measurements was determined to be an acceptable alternative with the provision that the licensee comply with all the vibration measurement requirements of ASME Operations and Maintenance Standards, Part 6, Inservice Testing of Pumps in Light-Water Reactor Power Plants.	DLC had revised Relief Request PRR-1 to specify that vibration measurements are to be performed in accordance with the requirements of OM-6. The acceptance criteria of OM-6 is included in the relief request.	The actions requested in the anomaly are complete. No further action is required.
2. PRR-2 NOTE: PRR-2 included several pumps discussed in several anomalies.	The licensee requested relief from measuring inlet pressure for the charging pumps and proposed to calculate inlet pressure based on the height of fluid above the pump suction. The proposed method is acceptable provided the accuracy requirements of the Code are met. However, the reviewer noted that Piping and Instrument Diagrams indicate test connections where instrumentation could be installed. Interim relief was granted to allow time for an investigation by DLC.	DLC verified that the inlet pressure calculations meet the Code requirements. Investigation of the use of test connections for measuring inlet pressure is underway and will be resolved during refueling outage 9R. If permanent or temporary pressure gauges are to be used, these pumps will be deleted from this relief request.	Interim relief was granted for one year or until the next refueling outage, whichever was longer. This action is to be resolved during refueling outage 9R. The licensee will need to install gauges, use temporary gauges, or revise and submit the relief request describing that gauges were determined to be impractical and the reasons for this determination. These actions must be completed prior to startup from 9R.

Anomaly	Description of Anomaly (May 6, 1991 SE)	DLC's Actions to Address Anomaly	Outstanding Actions
3. PRR-2	The licensee requested relief from measuring inlet pressure for the boric acid pumps and proposed to calculate inlet pressure based on the height of fluid above the pump suction. The proposed method is acceptable provided the accuracy requirements of the Code are met.	DLC verified that the inlet pressure calculations are within the Code required accuracy.	The concerns of this anomaly have been addressed. No further action is required.
4. PRR-3	Relief from measuring flow rate for the boric acid pumps was requested with a proposal to calculate flow during refueling outages. Relief was granted with the provision that the licensee ensure that calculations performed meet the Code accuracy requirements for flow measurement. Additionally, the licensee was to establish two sets of reference data for vibration because the flow path utilized during refueling outages is different than the one utilized during quarterly testing.	DLC verified that the flow rate calculations are within Code accuracy requirements. Separate vibration reference values will be utilized for each test flow condition in the implementing procedures.	The concerns of this anomaly have been addressed. No further action is required.
5. PRR-2	The licensee requested relief from measuring inlet pressure for the safety injection pumps and proposed to calculate inlet pressure based on the height of fluid above the pump suction. The proposed method is acceptable provided the accuracy requirements of the Code are met.	DLC verified that the inlet pressure calculations are within the Code required accuracy.	The concerns of this anomaly have been addressed. No further action is required.
6. PRR-2	The licensee requested relief from measuring inlet pressure for the quench spray pumps and proposed to calculate inlet pressure based on the height of fluid above the pump suction. The proposed method is acceptable provided the accuracy requirements of the Code are met. However, the reviewer noted that Piping and Instrument Diagrams indicate test connections where instrumentation could be installed. Interim relief was granted to allow time for an investigation by DLC.	DLC verified that the inlet pressure calculations meet the Code requirements. Investigation of the use of test connections for measuring inlet pressure is underway and will be resolved during refueling outage 9R. If permanent or temporary pressure gauges are to be used, these pumps will be deleted from this relief request.	Interim relief was granted for one year or until the next refueling outage, whichever was longer. This action is to be resolved during refueling outage 9R. The licensee will need to install gauges, use temporary gauges, or revise and submit the relief request describing that gauges were determined to be impractical and the reasons for this determination. These actions must be completed prior to startup from 9R.

Anomaly	Description of Anomaly (May 6, 1991 SE)	DLC's Actions to Address Anomaly	Outstanding Actions
7. PRR-2	The licensee requested relief from measuring inlet pressure for the inside recirculation spray pumps and proposed to calculate inlet pressure based on the height of fluid above the pump suction. The proposed method is acceptable provided the accuracy requirements of the Code are met.	DLC verified that the inlet pressure calculations are within the Code required accuracy.	The concerns of this anomaly have been addressed. No further action is required.
8. PRR-2	The licensee requested relief from measuring inlet pressure for the outside recirculation spray pumps and proposed to calculate inlet pressure based on the height of fluid above the pump suction. The proposed method is acceptable provided the accuracy requirements of the Code are met.	DLC verified that the inlet pressure calculations are within the Code required accuracy.	The concerns of this anomaly have been addressed. No further action is required.
9. PRR-8	Relief was requested from measuring flow rate quarterly for auxiliary feedwater (AFW) pumps, and alternatively, measuring flow rate on a refueling outage frequency. Relief was granted with the provision that the licensee investigate several discrepancies noted by the reviewers: (1) testing at cold shutdown was not discussed, (2) cold shutdown justification 25 indicated that the AFW pump discharge check valves are full stroked open during cold shutdown, (3) PRR-8 is not consistent with the pump testing outline, and (4) vibration reference values for both test configurations should be established.	The quarterly pump tests include measurement of both differential pressure and vibration with comparison to reference values. The pumps are also tested during cold shutdowns when the full-flow testing of the check valves is performed, even though no credit has been taken for the tests in the IST Program. The IST Program was revised to reference the cold shutdown testing for these pumps.	The licensee should ensure that vibration reference values are established for the different test configurations as necessary, depending on the results of the tests. The other concerns of the anomaly have been addressed. No further NRC action is required. The vibration reference values are subject to NRC inspection.
10. PRR-2	The licensee requested relief from measuring inlet pressure for the river water pumps and proposed to calculate inlet pressure based on the height of fluid above the pump suction. The proposed method is acceptable provided the accuracy requirements of the Code are met.	DLC verified that the inlet pressure calculations are within the Code required accuracy.	The concerns of this anomaly have been addressed. No further action is required.
11. PRR-10	The licensee requested relief from measuring flow rate for the diesel fuel oil transfer pumps and proposed to calculate flow rate based on the change in day tank level. The proposed method is acceptable provided the accuracy requirements of the Code are met.	DLC verified that the flow rate calculations are within the Code required accuracy.	The concerns of this anomaly have been addressed. No further action is required.

Anomaly	Description of Anomaly (May 6, 1991 SE)	DLC's Actions to Address Anomaly	Outstanding Actions
12. VRR-7	The licensee proposed to assign a maximum permissible leakage rate to the associated penetration and not individual valves, for chemical volume and control system valves TV-CH-200A, -200B, and -200C, as required by the Code. Relief was granted provided the limiting leak rate for the penetration is conservative considering the number and size of the valves in the group and does not allow excessive leakage through any particular valve in the group to go uncorrected.	DLC evaluated the allowable leakage rates for penetrations where individual leakage rates cannot be obtained. The maximum allowable leakage rate assigned to the entire penetration is the value normally assigned to the smallest valve in the group. In the subject penetration, the three valves are 8-inch valves. The individual allowable leakage rate for one 8-inch valve is 160 scfd; therefore, the allowable leakage rate for this penetration is 160 scfd.	The concerns of this anomaly have been addressed. No further action is required.
13. VRR-16	The licensee requested relief from exercising safety injection cold leg check valves SI-10/11/12 quarterly and proposed to exercise these valves during refueling outages. Relief was granted based on the impracticality of Code compliance due to the lack of flow instrumentation in the lines. However, it was unclear to the reviewer how a full-stroke open of these valves could be verified during refueling outages.	This relief request was further addressed in an NRC Safety Evaluation dated January 24, 1992, which stated that "based on the uncertainties of the proposed alternative test methods in verifying full-stroke opening of the subject check valves, the licensee should revise the testing to meet either Position 1 or Position 2 of GL 89-04 . . . by the next refueling outage." The testing will be revised to meet Position 1 or Position 2 of GL 89-04, and will be incorporated for use in refueling outage 9R. If necessary, a revised relief request will be submitted prior to 9R.	The licensee is to take the actions described for the next refueling outage. No further NRC action is required at this time.
14. VRR-18	The licensee requested relief from exercising low head safety injection check valves SI-23/24/25 quarterly and proposed to exercise these valves during refueling outages. Relief was granted based on the impracticality of Code compliance due to the lack of flow instrumentation in the lines. However, it was unclear to the reviewer how a full-stroke open of these valves could be verified during refueling outages.	This relief request was further addressed in an NRC Safety Evaluation dated January 24, 1992, which stated that "based on the uncertainties of the proposed alternative test methods in verifying full-stroke opening of the subject check valves, the licensee should revise the testing to meet either Position 1 or Position 2 of GL 89-04 . . . by the next refueling outage." The testing will be revised to meet Position 1 or Position 2 of GL 89-04, and will be incorporated for use in refueling outage 9R. If necessary, a revised relief request will be submitted prior to 9R.	The licensee is to take the actions described for the next refueling outage. No further NRC action is required at this time.

Anomaly	Description of Anomaly (May 6, 1991 SE)	DLC's Actions to Address Anomaly	Outstanding Actions
15. VRR-20	The licensee requested relief from exercising accumulator discharge check valves SI-48/49/50/51/52/53 quarterly and proposed to exercise these valves during refueling outages. Relief was granted based on the impracticality of Code compliance due to the lack of flow instrumentation in the lines. However, it was unclear to the reviewer how a full-stroke open of these valves could be verified during refueling outages.	This relief request was further addressed in an NRC Safety Evaluation dated January 24, 1992, which stated that "based on the uncertainties of the proposed alternative test methods in verifying full-stroke opening of the subject check valves, the licensee should revise the testing to meet either Position 1 or Position 2 of GL 89-04 . . . by the next refueling outage." The testing will be revised to meet Position 1 or Position 2 of GL 89-04, and will be incorporated for use in refueling outage 9R. If necessary, a revised relief request will be submitted prior to 9R. One method under consideration is to measure a C_v value during a blowdown at reduced accumulator pressure in conjunction with a nonintrusive test, similar to the method used at Ft. Calhoun Nuclear Station.	The licensee is to take the actions described for the next refueling outage. No further NRC action is required at this time.
16. VRR-21	The licensee requested relief from quarterly exercising safety injection check valves SI-83/84 and proposed to full-stroke exercise these valve during refueling outages. Based on drawings provided, a partial-stroke exercise of these valves could be performed during cold shutdown conditions. Relief was granted with the provision that the licensee develop a method to part-stroke these valves during cold shutdown.	DLC has determined that these valves can be part-stroke exercised during cold shutdown conditions. The relief request has been revised (Revision 1C) to include this provision.	The concern of this anomaly has been addressed. No further action is required.

Anomaly	Description of Anomaly (May 6, 1991 SE)	DLC's Actions to Address Anomaly	Outstanding Actions
17. VRR-22	The licensee requested relief from quarterly exercising boron injection and safety injection check valves SI-94/95 and proposed to full-stroke exercise these valve during refueling outages. Based on drawings provided, a partial-stroke exercise of these valves could be performed during cold shutdown conditions. Relief was granted with the provision that the licensee evaluate and develop a method to part-stroke these valves during cold shutdown.	DLC has determined that valve SI-95 can be part-stroke exercised during cold shutdown conditions, and is now included in VRR-21. Valve SI-94 cannot be part-stroke exercised during cold shutdown. Relief Request VRR-22 has been revised (Revision 1C) to address boron injection tank check valve SI-94 and includes justification of the impracticality of part-stroke exercising during cold shutdown as follows: "[P]art-stroke testing during CSD is not possible because the only flow path available is thruugh the BIT [boron injection tank]. Stroking the BIT outlet isolation valves couid result in borated, oxygenated water from the BIT entering the downstream piping. With no means to flush these lines, stagnant conditions develop upon valve closure. The ability to flush out the downstream piping to minimize the probability of intergranular stress corrosion cracking formation is only possible during refueling outages in conjunction with the SI full flow test."	The concerns of the provision of the granted relief have been addressed by the additional justification included in VRR-22. Therefore, the relief previously granted remains acceptable for full-stroke exercising valve SI-94 during refueling outages. No further action is required.
18. VRR-23	The licensee requested relief from quarterly exercising boron injection tank inlets, MOV-SI-867A/B, and proposed to full-stroke exercise these valves during refueling outages. Relief was denied based on inadequate justification of the impracticality of exercising these valves during cold shutdowns when charging pump discharge pressure is significantly lower.	Relief Request VRR-23 has been deleted from the IST Program. Cold Shutdown Justification No. 32 was created for these valves indicating that testing is performed during cold shutdowns.	The concerns of this anomaly have been addressed. No further action is required.
19. VRR-13	The licensee proposed using disassembly and inspection to exercise safety injection check valves SI-1/2. Relief was granted with the provision that the licensee address whether a part-stroke exercise is practical following reassembly, in accordance with the guidance in the Minutes of the Public Meetings on GL 89-04.	DLC has revised VRR-13 to include the basis for the impracticality of part-stroke exercising these valves following reassembly. The only flow path available to test these valves is to fill the containment sump with water and start the low head safety injection pumps. This would result in contaminated and dirty water being introduced into the refueling water storage tank and reactor coolant system.	The concerns of the provision of the granted relief have been addressed by the additional justification included in VRR-13. Therefore, the relief previously granted remains acceptable for valves SI-1/2. No further action is required.

Anomaly	Description of Anomaly (May 6, 1991 SE)	DLC's Actions to Address Anomaly	Outstanding Actions
20. VRR-25	The licensee proposed using disassembly and inspection to exercise recirculation spray check valves RS-158 and RS-160. Relief was granted with the provision that the licensee address whether a part-stroke exercise is practical following reassembly, in accordance with the guidance in the Minutes of the Public Meetings on GL 89-04.	DLC has revised VRR-25 to include the basis for the impracticality of part-stroke exercising these valves following reassembly. The only flow path available to test these valves would be to fill the outside recirculation spray pump casing with water and start the pump. The manual isolation valves would then be opened and the test would verify flow through the check valves, using an ultrasonic flow meter, to the charging system. Otherwise, the volume of water used to test the outside RS pumps is insufficient to stroke the check valves, even if the flow is directed to the suction of the high-head safety injection pumps. The part-stroke test would introduce water with entrained air into the charging/reactor coolant systems, resulting in chemistry problems in the primary coolant, and is, therefore, impractical.	The concerns of the provision of the granted relief have been addressed by the additional justification included in VRR-25. Therefore, the relief previously granted remains acceptable for valves RS-158 and RS-159. Because the valves cannot be part-stroke exercised following reassembly, the licensee should ensure that the maintenance procedures include provisions for proper disk orientation. No further action is required.
21. VRR-27	Interim relief was granted for one year or until the next refueling outage, whichever is longer, to assign a maximum leak rate to an entire penetration barrier instead of assigning individual valve leak rates to component cooling water valves TV-CC-110F1/110F2 as required by the Code. It appeared that for the particular penetration, individual leak rates could be assigned and measured.	DLC has submitted a revised relief request for review. These boundary valves cannot be individually leak rate tested. The boundary downstream valve, 110F1, is a potentially open check valve leading to the circulating water system. Therefore, the river water system downstream of 110F1 cannot be isolated to provide an accurate leakage rate for 110F2.	Relief is granted in the enclosed SE pursuant to 10 CFR 50.55a (f)(6)(i). No further action is required.

Anomaly	Description of Anomaly (May 6, 1991 SE)	DLC's Actions to Address Anomaly	Outstanding Actions
22. VRR-30	The licensee requested relief from quarterly exercising main steam check valves MS-80/81/82 and proposed to disassemble and inspect these valves during refueling outages on a rotating schedule. Relief was granted with the provision that a partial-stroke exercise following reassembly be performed, if practical. Interim relief was granted to allow a period for determination of a method to verify closure.	DLC has incorporated a partial-stroke exercise following reassembly. The relief request has been revised to describe the impracticality of performing closure verification by means other than by disassembly and inspection.	GL 89-04, Position 2, approved the use of a disassembly and inspection program for check valves 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." Therefore, this relief request is approved per GL 89-04, with the provision that the licensee implements the disassembly and inspection program in accordance with the guidance delineated in Position 2. Reference GL 89-04, IST Program Approval.
23. VRR-32	The licensee requested relief from quarterly exercising river water check valves RW-110/111/112 and 113 and proposed to disassembly and inspect these valves during refueling outages on a rotating schedule. Relief was granted with the provision that a partial-stroke exercise following reassembly be performed, if practical. The reviewer indicated that it was unclear what "once every 5 years" meant for the schedule of disassembly and inspection.	A part-stroke exercise quarterly has been incorporated into VRR-32. The intent is to disassemble and inspect one valve each refueling outage on a rotating schedule such that each valve is inspected at least once every five years. The relief request has been revised to more clearly stipulate this schedule.	The concerns of this anomaly have been addressed. No further action is required.
24. VRR-33	Relief from quarterly exercising river water check valves RW-135 and RW-136 was requested with a proposal to full-stroke these valves during refueling outages. Interim relief was granted to allow the licensee a period to determine if exercising can be performed in accordance with the Code required frequency.	DLC has removed the internals of these check valves. Therefore, VRR-33 is no longer required. The valves are no longer required to be exercised and are no longer in the IST Program. The revised program submitted 9/25/92 deleted the valves and this relief request.	No further action is required.

Anomaly	Description of Anomaly (May 6, 1991 SE)	DLC's Actions to Address Anomaly	Outstanding Actions
25. VRR-34	The licensee requested relief from quarterly exercising check valves RW-197/198 and proposed to disassembly and inspect these valves during refueling outages on a rotating schedule. Relief was granted with the provision that a partial-stroke exercise following reassembly be performed, if practical.	DLC has removed the internals of these check valves. Therefore, VRR-34 is no longer required. The valves are no longer required to be exercised and are no longer in the IST Program. The revised program submitted 9/25/92 deleted the valves and this relief request.	No further action is required.
26. VRR-37	Relief from quarterly stroking and timing control room emergency air bottle outlet trip isolation valves was requested with a proposal to stroke these valves once every 18 months, but not measure stroke times. Interim relief was granted for a period of one year on until the next refueling outage, whichever is longer. The licensee was requested to investigate nonintrusive methods to monitor for valve degradation.	DLC revised the relief request to stipulate that the valves will be stroked quarterly. The current revision of VRR-37 relates only to not measuring stroke time. The licensee's proposal does not provide an alternative means for monitoring for valve degradation.	Prior to the expiration of the interim relief at the end of refueling outage 9R, the licensee must determine a means to monitor these valves for degradation. A revised relief request describing the method is to be submitted prior to startup from 9R.
27. N/A	The licensee was requested to investigate methods to verify full and partial stroke exercising for various valves, such as installation of flow instrumentation or utilization of nonintrusive techniques.	No information was provided relative to this anomaly.	DLC should include this information with their next IST related submittal.
28. VRR-15	Relief was requested from quarterly exercising low head safety injection pump discharge check valves SI-6/7 in accordance with IWV-3522 with a proposal to perform partial-stroke exercising quarterly and full-stroke exercising during refueling outages. Provisional relief was granted because information on the method of partial-stroke exercising was not included in the relief request.	DLC reviewed the partial-stroke exercising method. The valves had been considered to be part-stroke exercised by recording the pressure change in a dead leg of pipe down stream of the check valves before and after pump start. It was determined that this method does not provide a true part-stroke of these valves. Relief Request VRR-15 was revised to more correctly indicate that these valves are exercised closed quarterly and full-stroke exercised open at refueling outages.	The concerns of this anomaly have been addressed by the revision to VRR-15. The relief previously granted remains effective for the revised relief request to allow full-stroke exercising with accident flow during refueling outages. No further action is required.

Anomaly	Description of Anomaly (May 6, 1991 SE)	DLC's Actions to Address Anomaly	Outstanding Actions
29. VRR-19	Relief was granted from the quarterly exercising frequency for check valve SI-27, high head safety injection/charging pump refueling water storage tank suction valves, with a proposal to partial-stroke the valve quarterly and full-stroke exercise the valve during refueling outages, with the provision that a partial stroke exercise be performed when shutting down from power operation to cold shutdown in addition to the proposed testing.	DLC has revised VRR-19 to indicate that a part-stroke exercise will be performed quarterly when system configuration permits, that a part-stroke exercise will be performed on a cold shutdown frequency, and that a full-stroke exercising will be performed during refueling outages.	The concerns of this anomaly have been addressed by the revision of VRR-19. No further action is required.