June 7, 2001

Mr. John K. Wood
Vice President - Nuclear, Perry
FirstEnergy Nuclear Operating Company
P.O. Box 97, A200
Perry, OH 44081

SUBJECT: PERRY NUCLEAR POWER PLANT, UNIT 1 - SAFETY EVALUATION OF RELIEF REQUESTS ASSOCIATED WITH THE SECOND 10-YEAR INTERVAL INSERVICE TESTING PROGRAM FOR PUMPS AND VALVES (TAC NO. MB1300)

Dear Mr. Wood:

By letter dated July 22, 1998 (PY-CEI/NRR-2290L), FirstEnergy Nuclear Operating Company, the licensee, submitted its second 10-year interval inservice testing (IST) program for pumps and valves for the Perry Nuclear Power Plant. In our safety evaluation, dated August 9, 1999, we requested that you address a number of recommended action items relating to the IST program relief requests. Your letter dated February 26, 2001 (PY-CEI/NRR-2549L), addressed these recommended action items. In addition, your letter included four revised relief requests (VR-1, VR-3, VR-4, and VR-9) and one new relief request (VR-5) for review and approval. All relief requests are for the second ten-year inspection interval.

Relief Request VR-1 requests relief for the control rod drive hydraulic control unit scram valves from the requirements of OMa-1988, Part 10, Paragraphs 4.2.1 and 4.3.2 which specify the test frequency requirements and require that all power-operated valves shall have their stroke time measured. Pursuant to the provisions of 10 CFR 50.55a(f)(6)(i), the staff authorizes the proposed alternative that substitutes scram insertion timing tests for individual valve testing based on a finding that the Code requirements are impractical and in consideration of the burden on the licensee if the Code requirements were imposed on the facility.

Relief Request VR-3 requests relief for the solenoid-operated valves which supply air to the air operators for the nuclear boiler automatic depressurization system (ADS) and safety/relief valves (SRVs) from the requirements of OMa-1988, Part 10, Paragraph 4.2.1 which specifies the test frequency requirements of power-operated valves. Pursuant to the provisions of 10 CFR 50.55a(f)(6)(i), the staff authorizes the proposed alternative testing that exercises the ADS valves and SRVs on a staggered basis in conjunction with the 24-month technical specification (TS) surveillance test based on the impracticality of performing testing in accordance with the Code requirements and in consideration of the burden on the licensee if the Code requirements were imposed on the facility.

Request VR-4 requests relief for the low pressure core spray (LPCS), residual hear removal (RHR), and reactor core isolation cooling (RCIC) keep fill pump discharge check valves from the requirements of OMa-1988, Part 10, Paragraph 4.3.2 which specifies the test frequency of

check valves. Pursuant to the provisions of 10 CFR 50.55a(a)(3)(ii), the staff authorizes the proposed alternative testing for the check valves as described in Section 3.3 of this safety evaluation (SE) for the remainder of the current 10-year interval based on the determination that compliance with the Code requirements results in a hardship without a compensating increase in the level of quality and safety.

Relief Request VR-9 requests relief for RCIC penetration pressurization series-pair check valves from the requirements of OMa-1988, Part 10, Paragraph 4.3.2 which specifies the test frequency of check valves. Pursuant to the provisions of 10 CFR 50.55a(a)(3)(i), the staff authorizes the proposed alternative testing for the check valves as described in Section 3.4 of this SE for the remainder of the current 10-year interval based on the alternative providing an acceptable level of quality and safety.

Relief Request VR-5 requests relief for starting air valves supplying starting air for the Division 1, 2, and 3 standby diesel generators from the requirements of OMa-1988, Part 10, Paragraph 4.2.1 which specifies the test frequency requirements of power-operated valves. Pursuant to the provisions of 10 CFR 50.55a(a)(3)(ii), the staff authorizes the proposed alternative for the solenoid-operated valves listed in Section 3.5 of this SE is for the remainder of the current 10-year interval based on the determination that compliance with the Code requirements result in a hardship without a compensating increase in the level of quality and safety.

The staff's SE is enclosed.

Sincerely,

***/RA/***

Anthony J. Mendiola, Chief, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-440

Enclosure: As stated

cc w/encl: See next page

check valves. Pursuant to the provisions of 10 CFR 50.55a(a)(3)(ii), the staff authorizes the proposed alternative testing for the check valves as described in Section 3.3 of this safety evaluation (SE) for the remainder of the current 10-year interval based on the determination that compliance with the Code requirements results in a hardship without a compensating increase in the level of quality and safety.

Relief Request VR-9 requests relief for RCIC penetration pressurization series-pair check valves from the requirements of OMa-1988, Part 10, Paragraph 4.3.2 which specifies the test frequency of check valves. Pursuant to the provisions of 10 CFR 50.55a(a)(3)(i), the staff authorizes the proposed alternative testing for the check valves as described in Section 3.4 of this SE for the remainder of the current 10-year interval based on the alternative providing an acceptable level of quality and safety.

Relief Request VR-5 requests relief for starting air valves supplying starting air for the Division 1, 2, and 3 standby diesel generators from the requirements of OMa-1988, Part 10, Paragraph 4.2.1 which specifies the test frequency requirements of power-operated valves. Pursuant to the provisions of 10 CFR 50.55a(a)(3)(ii), the staff authorizes the proposed alternative for the solenoid-operated valves listed in Section 3.5 of this SE is for the remainder of the current 10-year interval based on the determination that compliance with the Code requirements result in a hardship without a compensating increase in the level of quality and safety.

The staff's SE is enclosed.

Sincerely,

***/RA/***
Anthony J. Mendiola, Chief, Section 2
Project Directorate III
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE INSERVICE TESTING PROGRAM, SECOND 10-YEAR INTERVAL

FIRSTENERGY NUCLEAR OPERATING COMPANY

PERRY NUCLEAR POWER PLANT

DOCKET NO. 50-440

## 1.0 INTRODUCTION

The *Code of Federal Regulations*, 10 CFR 50.55a, requires that inservice testing (IST) of certain American Society of Mechanical Engineers (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* (the Code) and applicable addenda, except where alternatives have been authorized or relief has been requested by the licensee and granted by the Commission pursuant to paragraphs (a)(3)(i), (a)(3)(ii), or (f)(6)(i) of 10 CFR 50.55a. In proposing alternatives or requesting relief, the licensee must demonstrate that: (1) the proposed alternatives provide an acceptable level of quality and safety; (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety; or (3) conformance is impractical for its facility. Section 50.55a authorizes the Commission to approve alternatives and to grant relief from ASME code requirements upon making the necessary findings. Nuclear Regulatory Commission (NRC) guidance contained in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," provides alternatives to the Code requirements which are acceptable. Further guidance is given in GL 89-04, Supplement 1, and NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants."

By letter dated July 22, 1998, FirstEnergy Nuclear Operating Company, the licensee, submitted its second 10-year interval (IST) program for pumps and valves for the Perry Nuclear Power Plant. The NRC issued a safety evaluation (SE) in a letter dated August 9, 1999, which included a number of recommended action items, related to their IST program relief requests, that the licensee was requested to address. The licensee responded in a letter dated February 26, 2001, addressing each item discussed in the referenced SE. In addition, the licensee included four revised relief requests (VR-1, VR-3, VR-4, and VR-9) and one new relief request (VR-5) for review and approval. The NRC's findings with respect to authorizing alternatives and granting or denying the IST program relief requests are provided in Section 3 of this SE.

The IST program was developed in accordance with the requirements of the 1989 Edition of the ASME Code by implementation of the 1987 ASME/ANSI *Operations and Maintenance (OM) Standards* Part 1, Part 6, and Part 10 (OM-1, OM-6, and OM-10) for IST of safety and relief devices, pumps, and valves respectively.

## 2.0 RECOMMENDED ACTION ITEMS

The Technical Evaluation Report (TER) prepared by Brookhaven National Laboratory, included in the SE sent to the licensee on August 9, 1999, contained 33 recommended action items that the licensee was requested to address. The licensee provided responses to these recommended action items in its letter dated February 26, 2001. Included below are staff comments on selected responses. No response to these comments is necessary. The NRC may elect to review these issues in conjunction with future inspection activities at Perry.

### 2.1 Relief Request Recommended Action 2

Relief Requests PR-4 and PR-5, which proposed alternative vibration acceptance criteria for those safety-related pumps defined by the licensee as "smooth-running," were authorized on an interim basis in the August 9, 1999, SE. In its letter dated February 26, 2001, the licensee stated that these relief requests will not be implemented at this time. Because the interim period has expired, a new relief request will be required if the licensee intends to implement alternative vibration acceptance criteria for these pumps.

### 2.2 Recommended Action 1 for Deferral Justifications

The licensee has stated that the closure testing for reactor coolant system pressure isolation testable check valves will consist partially of verification of position indication at cold shutdowns. It has been observed that similar valves have been exercised at power and shutdowns in both directions. Based on the response to this recommended action, the testing performed on these valves cannot be definitively ascertained. The licensee should ensure that its testing is in accordance with Code requirements and make any changes as necessary.

### 2.3 Recommended Actions in System Review Concerning Test Valves

The licensee has noted, in response to comments in the TER, that certain test valves do not perform safety functions and therefore are not included in the IST program. It has been noted that certain test valves have been included in a particular IST program when the valve has an automatic actuation signal to close to prevent the diversion of flow. The licensee may wish to review its IST program to verify that such valves have been considered for inclusion in the IST program.

## 3.0 RELIEF REQUESTS

### 3.1 Valve Relief Request VR-1

The licensee has requested relief from the Code exercise requirements of OM-10, Paragraph 4.2.1, for the control rod drive scram inlet and exhaust solenoid-operated valves 1C11-126 and 1C11-127 respectively. In addition, the licensee has requested relief from the Code check valve exercise requirements of OM-10, Paragraph 4.3.2 for the scram discharge header check and accumulator supply check valves 1C11-114, 1C11-115 respectively. A group of four valves is located on each of the 177 hydraulic control units at Perry, for a total of 708 valves covered by this relief request. The

licensee proposes to use the scram insertion test in lieu of individual valve testing consistent with NRC GL 89-04, Position 7.

3.1.1 Licensee's Basis for Requesting Relief

The licensee states:

> These valves operate as an integral part of the hydraulic control unit to rapidly insert control rods. Solenoid valves 1C11-126 & 1C11-127 will be fully tested and check valves 1C11-114 & 1C11-115 will be exercised open in accordance with Technical Specifications (TS) (i.e., maximum scram insertion time). The TS surveillance required frequency of testing (i.e., all control rods prior to thermal power exceeding 40 percent of rated thermal power after fuel movement within the reactor pressure vessel, and after each reactor shutdown $\geq$120 days, and testing of a representative sample of the control rods at least once per 120 days of operation in mode 1), assures the necessary quality of the system and components is maintained, that facility operation will be within the safety limits, and the limiting condition of operation will be met. Therefore, compliance with the ASME Code would be impractical per 10 CFR 50.55a(f)(6)(i).

3.1.2 Alternate Testing

The licensee proposes that scram insertion testing shall be substituted for individual valve testing.

3.1.3 Evaluation

The staff has reviewed the basis for requesting relief and the proposed alternate testing and has determined that the changes from the alternative previously authorized for Relief Request VR-1 in the August 9, 1999, SE are clarifications. Therefore, the authorized alternative remains valid for the remainder of the second ten-year inspection interval.

3.2 Valve Relief Request VR-3

The licensee has requested relief from the Code exercise requirements of OM-10, Paragraph 4.2.1, for the solenoid valves listed below. These valves supply air to air operators of the nuclear boiler automatic depressurization system (ADS) and safety/relief valves (SRVs). The licensee proposes to perform exercise testing on a staggered basis in which half of the valves would be tested in one 24-month period and the remaining half of the valves would be tested during the next 24-month period.

| | | | | |
|---|---|---|---|---|
| 1B21-F410A | 1B21-F410B | 1B21-F411A | 1B21-F411B | 1B21-F412A |
| 1B21-F412B | 1B21-F413A | 1B21-F413B | 1B21-F414A | 1B21-F414B |
| 1B21-F415A | 1B21-F415B | 1B21-F416A | 1B21-F416B | 1B21-F417A |
| 1B21-F417B | 1B21-F420A | 1B21-F420B | 1B21-F421A | 1B21-F421B |
| 1B21-F422A | 1B21-F422B | 1B21-F423A | 1B21-F423B | 1B21-F424A |
| 1B21-F424B | 1B21-F425A | 1B21-F425B | 1B21-F440A | 1B21-F440B |
| 1B21-F441A | 1B21-F441B | 1B21-F442A | 1B21-F442B | 1B21-F443A |
| 1B21-F443B | 1B21-F444A | 1B21-F444B | | |

3.2.1 Licensee's Basis for Requesting Relief

The licensee states:

> These solenoid operated valves are proven operable during testing of the Nuclear Boiler ADS and SRV. Also, in a study (Boiling Water Reactor Owners' Group Evaluation of NUREG-0737, Item ll.K.3.16) the number of ADS and safety relief valve openings should be reduced as much as possible to minimize LOCA [loss-of-coolant accident] risk. The [Perry] design provides two solenoid valves for each SRV, with divisional separation of the solenoid valves, such that an SRV exercise only exercises one of the two solenoid valves. Based on this study, and the potential for causing a LOCA condition, exercising these valves is delayed to refueling.
>
> The solenoid valves are proven operable by remotely actuating the SRV to verify open and close capability of the relief valve prior to resumption of electric power generation. The solenoid operated valves will be tested at the TS surveillance required frequency of testing (i.e., every 24 months on a STAGGERED TEST BASIS for each solenoid valve). If a SRV fails to meet its acceptance criteria during cycling, the associated SRV solenoid valves will be evaluated to determine if corrective action should be taken. Therefore, the alternative test provides an acceptable level of quality and safety.
>
> If during the STAGGERED TEST BASIS testing one of the solenoid valves fail, then the remaining solenoid valves shall be tested.

3.2.2 Alternate Testing

The licensee proposes:

> Solenoid operated valve exercise testing shall be performed on a refueling outage frequency, in accordance with the TS surveillance requirements prior to resumption of electric power, by exercising the SRV(s).

3.2.3 Evaluation

The Code requires that power-operated valves be stroke-time tested either quarterly or during shutdowns where practical. The listed solenoid valves have a safety function to open to provide air to actuate ADS valves and SRVs. There are two solenoid valves for each relief valve. Stroke-time testing of these valves is impractical because the valves are totally enclosed with no external position indication. It would be a burden on the licensee if the Code requirements were imposed because either the valves or the system would require redesign. In order to exercise both valves every refueling outage, the ADS valves and SRVs would have to be actuated twice during each refueling outage. The staff agrees with the licensee that relief valve actuations should be minimized in order to reduce system and component challenges.

The licensee has proposed to meet the Code requirements in conjunction with the 24-month TS required exercise of each ADS valve and relief valve. Because only one solenoid valve is required to actuate each relief valve, each solenoid valve will be tested

on a staggered basis every 48 months. Therefore, one of the two solenoid valves associated with an individual ADS valve or an SRV would be tested during the first 24-month period with the other associated solenoid valve being tested during the following 24-month period. The acceptance criteria for each solenoid valve will be based on the successful exercise of its associated relief valve.

This proposed relief request was granted in a SE dated August 9, 1999, with the provision that if one of the tested solenoid valves fails during a refueling outage, the remaining solenoid valves will also be tested during that outage. If an SRV fails to meet its acceptance criteria (e.g., the solenoid valve actuates but the associated relief valve does not meet its acceptance criteria), the associated SRV solenoid valve shall be evaluated to determine if corrective action is required to be performed. This corrective action is consistent with the provisional relief granted in the August 9, 1999, SE.

While it is impractical to stroke-time these solenoid valves, it is not impractical to exercise them each refueling outage. However, the proposed alternative to stroke-time testing includes a modified test interval which recognizes the impracticality of stroke-time testing these solenoid valves, and the NRC guidance with respect to minimizing exercises of ADS valves and SRVs. The staff finds that the proposed testing provides reasonable assurance of operational readiness.

3.2.4 Conclusion

Relief is granted for the solenoid valves listed in Section 3.2 of this SE, to exercise the ADS valves and SRVs on a staggered basis in conjunction with the 24-month TS surveillance test pursuant to 10 CFR 50.55a(f)(6)(i) based on the impracticality of performing testing in accordance with the Code exercise requirements of OM-10, Paragraph 4.2.1, and in consideration of the burden on the licensee if the Code requirements were imposed on the facility.

3.3 Valve Relief Request VR-4

The licensee has requested relief from the Code check valve exercise requirements of OM-10, Paragraph 4.3.2, for the check valves listed below. The licensee has proposed to disassemble and inspect these check valves in accordance with the guidance of GL 89-04, Position 2.

| | | | | | |
|---|---|---|---|---|---|
| 1R45-F577A | 1R45-F577B | 1R45-F578A | 1R45-F578B | 1R45-F579A | 1R45-F579B |
| 1E12-F084A | 1E12-F084B | 1E12-F084C | 1E51-F061 | 1E51-F079 | 1E51-F081 |

3.3.1 Licensee's Basis for Requesting Relief

The licensee has provided the following basis for requesting relief for each group of check valves referenced in this relief request:

1E12-F084A/B/C and 1E51-F061: These simple check valves are the outboard check of a series pair for the safety-related keep fill pump discharge. They provide the high to low pressure interface to prevent overpressurization of the low pressure portion of the system.

Both the associated inboard and involved outboard check valves are in close proximity to each other. The valves being in such close proximity make non-intrusive testing an option that is not preferred due to the difficulty in analyzing the test data (e.g., with acoustics it is difficult to determine which valve closed). Also with the system configuration it is difficult to get reversal/cessation of flow to close the valve with sufficient force to test. At cold shutdown, these valves are exercised open by verifying proper keep fill system flow.

The associated inboard stop check valves can be verified closed using the manual handwheel (in accordance with the guidance provided in September 26, 1991, Supplement to the public meetings on GL 89-04). The system configuration does not include test connections between the involved outboard valves and their associated inboard stop check valves. Hence, the closure of the outboard check valves cannot be individually verified. The system would have to be redesigned and modified to perform the code required testing. Disassembly and inspection of these valves on a sampling basis to assess their closure capability provides reasonable assurance of the valves' operational readiness.

1R45-F577A and F578A, Division 1 Standby Diesel Generator Fuel Oil Transfer pump siphon breakers, 1R45-F577B and F578B, Division 2 Standby Diesel Generator Fuel Oil Transfer pump siphon breakers, and 1R45-F579A and F579B, Division 3 HPCS Diesel Generator Fuel Oil Transfer pump siphon breakers are simple lift check valves. These valves break the potential siphon between the Fuel Oil Day Tank and the Fuel Oil Storage Tank to prevent the Fuel Oil Day Tank from siphoning back to the Fuel Oil Storage Tank. An attempt was made to comply with the ASME Code required Exercise Closed by using both the Dynasonics and Controlotron non-intrusive ultrasonic flow meters. The Dynasonics was unable to accurately measure flow since it required suspended solids for proper indication of flow, which, clean Number 2 fuel oil does not have. The Controlotrons were unable to accurately measure flow since they need certain physical attributes (e.g., 15 pipe diameters from flow disturbance) to be met for proper indication of flow, which, could not be met by the piping systems. Also the Controlotrons could not be physically installed in an area of the piping system with laminar flow (upstream side of check) for all the check valves. Acoustical testing was considered but not attempted due to the size of the check valves, the orientation of the check valves, and the lack of reverse flow to positively seat the check valve while testing.

1E51-F079 and 1E51-F081 break the vacuum of the reactor core isolation coolant (RCIC) exhaust piping upon RCIC shutdown. These simple check valves were evaluated by engineering and may not be treated as a series pair assembly, as both valves are needed to perform their function. These check valves currently have no intermediate test connections to allow individual valve testing. The intended long term fix for these valves is to install an intermediate test connection to allow for testing individually. However, in the interim period, sample disassembly and inspections will provide sufficient data to assess their closure capabilities and will provide reasonable assurance of the valves operational readiness. Both the associated inboard and involved outboard check valves are in close proximity to each other. The valves being in such close proximity make non-intrusive testing an option that is not preferred due to the difficulty in analyzing the test data (e.g., with acoustics it is difficult to determine which valve closed). Also with the system configuration, it is difficult to get reversal/cessation of flow to close the valve with sufficient force to test.

The NRC staff previously accepted valve disassembly and inspection on a sampling basis as an alternative to full flow testing in GL 89-04, Attachment 1, Position 2. Due to the scope of the activity and system operating restrictions, these valve disassemblies will be performed during reactor refueling outages for the safety-related keep fill system check valves and during on-line divisional diesel outages or reactor refueling outages for the Division 1, 2, 3 valves.

All check valves will continue to be exercised open in accordance with OM-10, paragraph 4.3.2. Therefore, in accordance with 10 CFR 50.55a(a)(3)(ii), it is requested that the proposed alternative be authorized, since it provides reasonable assurance of the check valves operational readiness. Also the imposition of the Code requirements would result in a hardship without a compensating increase in the level of quality and safety.

3.3.2 Alternate Testing

The licensee proposes:

> A sample disassembly and inspection plan which is consistent with GL 89-04, Attachment 1, Position 2, will be utilized to verify check valve closure. Sample groups may consist of more than 4 valves; however, all valves within each group must be disassembled within a maximum of three refueling outages/cycles. The keep fill check valves are exercised open following their re-assembly by verifying proper keep fill pump flow. The siphon breaker check valves are exercised open following their re-assembly by verifying no reverse rotation of the applicable pump when secured.
>
> If a check valve fails its disassembly and inspection, it will be repaired or replaced and satisfactorily retested prior to returning to service.

3.3.3 Evaluation

The Code requires that check valves be exercised either quarterly or during shutdowns where practical. As an alternative, GL 89-04, Position 2, “Back Flow Testing of Check Valves,” provides guidance for establishing a sample disassembly and inspection program for groups of check valves in which the size, manufacturer, model, and service conditions are the same. Once the grouping is established in accordance with the guidance in Position 2, one check valve in the group may be disassembled and inspected each refueling outage. If the check valve being disassembled fails the inspection, the guidance specifies that the remaining check valves in the group shall be disassembled and inspected. Relief is required to implement this guidance. Deviations from the guidance, such as performing the disassembly and inspection outside of refueling outages, have been previously authorized by the staff.

The valves covered by this relief request are check valves aligned in series with safety functions in both the open and closed directions. Inservice testing of the open safety function of these valves will continue to be conducted in accordance with OM-10, Paragraph 4.3.2. Additional guidance on closure verification of series check valves is included in NUREG-1482, Section 4.1.1. The guidance states that when it is impractical to test a pair of check valves in accordance with the Code, the licensee may

demonstrate the capability of both valves to close by use of the guidance in Position 2. The licensee has provided information associated with the testing of these check valves which demonstrates the hardship associated with performing the check valve exercising testing in accordance with the Code without a compensating increase in safety.

The licensee has proposed to disassemble and inspect these check valves in accordance with the guidance in Position 2. In addition, the licensee has proposed two deviations to the guidance: 1) allowing the valve groups to be larger than four valves, but performing the disassembly and inspection of all the valves in the group within a maximum of three refueling outages; and 2) allowing the performance of certain disassembly and inspections to take place in plant modes of operation other than refueling outages. With respect to the size of the valve groups, the guidance of Position 2 was patterned on a four-train system with one valve in each train. The staff finds it acceptable to have groups larger than four valves which meet the grouping criteria specified in Position 2. However, if a particular check valve being disassembled fails the inspection, then all of the remaining check valves within its group, regardless of the number of valves in the group, must be disassembled and inspected.

As stated above, the licensee has also requested to deviate from the refueling outage disassembly interval specified in Position 2. The refueling outage interval was selected in the original guidance because it was anticipated that check valve disassembly and inspection would not be practical during any other mode of plant operation. However, with the advent of significant maintenance activities being performed on systems out of service at power, it is practical to perform disassembly and inspection of certain check valves in parallel with other system maintenance activities. Therefore, the proposed alternative provides reasonable assurance of operational readiness. The licensee should note that the disassembly and inspection interval shall be consistent with the current refueling cycle interval and this deviation should not be used to systematically increase the length of the inspection interval.

The licensee's proposed alternative testing includes information which appears contradictory. Although the licensee stated that sample disassembly and inspection would be performed consistent with GL 89-04, Attachment 1, Position 2, the licensee also stated that if a check valve fails its disassembly and inspection, the check valve will be repaired or replaced and satisfactorily retested prior to returning to service. Per the guidance in Position 2, all check valves in a sample group are required to be disassembled and inspected if the valve fails inspection. The licensee was contacted about this discrepancy and informed the staff of its intent to be consistent with the Position 2 guidance and to perform disassembly and inspection of all check valves in a sample group in the event that a check valve in a particular group fails its inspection. The licensee may wish to revise its alternative testing basis to reflect this clarification.

3.3.4 Conclusion

The proposed alternative for the check valves listed in Section 3.3 of this SE is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the remainder of the current 10-year interval based on the determination that compliance with the Code check valve exercise requirements of OM-10, Paragraph 4.3.2, results in a hardship without a compensating increase in the level of quality and safety.

3.4 Valve Relief Request VR-9

The licensee has requested relief from the Code check valve testing requirements of OM-10, Paragraph 4.3.2, for the penetration pressurization series-pair check valves 1P53-F572B, 1F53-F573B, and 1P53-F574. The licensee proposes to perform exercise tests of these pairs of check valves every refueling outage.

3.4.1 Licensee's Basis for Requesting Relief

The licensee states:

> 1P53-F572B and 1P53-F573B serve as the lower containment airlock small seal and large seal accumulator check valves, respectively. The air supply line upstream of these two check valves is common and contains a third check valve, 1P53-F574, in series.
>
> These valves serve as the pressure boundary to ensure adequate seal pressure is maintained upon loss of the instrument air (P52) supply. The inflatable seal system pressure boundary is verified operable by conducting a seal pneumatic system leak test and verifying that system pressure does not decay more than 1.5 psig from 90 psig within 24 hours or 0.45 psig from 90 psig within eight hours. Satisfactory completion of the decay pressure test verifies the valve leak rate test requirements. The valve seat leakage shall be determined by measuring pressure decay in the test volume with the apparent leakage rate being charged to the valve combination being tested (series check valves).
>
> The ASME required Exercise Closed valve test will be satisfied by obtaining a satisfactory pressure decay test. Verifying the normal position by means other than a pressure decay test is not practical. This test makes the airlocks inoperable for an extended period of time, thus restricting access to the containment. Therefore, performance of the normal position verification on other than the TS frequency would result in a hardship without a compensating increase in the level of safety due to a prolonged restriction of access, causing a possible safety concern and unnecessary wear of sealing parts.
>
> If the pressure decay test were to fail for the series pair check valves, both check valves will be repaired or replaced as necessary.

3.4.2 Alternate Testing

The licensee proposes:

> Perform valve exercise testing of the series-pair, 1P53-F572B/F574 and 1P53-F573B/F574, during refueling outage.

3.4.3 Evaluation

The Code requires that check valves be exercised either quarterly or during shutdowns where practical. The three check valves addressed in this relief request are in a series/parallel arrangement and all have a safety function in the closed direction. Guidance on closure verification of series check valves is included in NUREG-1482,

Section 4.1.1. The only stated issue associated with testing these valves quarterly in accordance with the Code requirements is that use of the containment airlock would be restricted for an unspecified period of time. As stated in NUREG-1482, Section 3.1.2, unless accompanied by other acceptable rationale, a required entry into a limited condition for operation to perform IST would not justify deferring testing until a cold shutdown or refueling outage. However, a particular test strategy, which is more comprehensive than required by the Code, may justify a longer interval.

The licensee has proposed to test these check valves every refueling outage by performing a pressure decay test of the air lock seal system. This test has specific acceptance criteria which the licensee plans to use to demonstrate the closure of each check valve pair. If the check valve pair fails the pressure decay test, both check valves in the pair will either be repaired or replaced. The proposed testing provides an acceptable level of quality and safety because the test method and acceptance criteria are definitive and more stringent than required by the Code.

3.4.4 Conclusion

The proposed alternative to the Code check valve testing requirements of OM-10, Paragraph 4.3.2, for the penetration pressurization series-pair check valves 1P53-F572B, 1F53-F573B, and 1P53-F574, is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the remainder of the current 10-year interval based on the alternative providing an acceptable level of quality and safety.

3.5 Valve Relief Request VR-5

The licensee has requested relief from the Code valve test requirements of OM-10, Paragraph 4.2.1, for the solenoid-operated valves listed below. The licensee has proposed to test these valves in conjunction with diesel generator testing.

| | | | | |
|---|---|---|---|---|
| 1E22-F541A | 1E22-F541B | 1E22-F543A | 1E22-F543B | 1R44-F010A |
| 1R44-F011A | 1R44-F010B | 1R44-F011B | 1R44-F015A | 1R44-F016A |
| 1R44-F015B | 1R44-F016B | 1R44-F020A | 1R44-F021A | 1R44-F020B |
| 1R44-F021B | 1R44-F025A | 1R44-F026A | 1R44-F025B | 1R44-F026B |

3.5.1 Licensee's Basis for Requesting Relief

The licensee states:

> It is impractical to measure the stroke times of these valves because they are totally enclosed solenoid/air operated valves which have no externally visible indication of valve position. Failure of a valve to perform the required function will result in an increase in the starting time of the diesel generator or failure to secure starting air.
>
> Division 3 HPCS [high pressure core spray] requires both air start solenoids to open to satisfy its starting time for operability, thus, normal monthly timing verifies operability. Therefore, the proposed alternative provides an equal level of quality and safety.

Division 1 and Division 2 standby diesel air starting systems have two independent air banks with each air bank having two parallel starting air solenoid valves. During performance of monthly diesel surveillance tests, a pre-start air roll and a post-shutdown air roll are performed on each standby diesel. During performance of the pre-start air roll, both air banks are operated and only one parallel starting air solenoid valve in each air bank is energized to roll the diesel. The two energized starting air solenoid valves (one in each air bank) are (1) verified open, by verification of an acceptable diesel start time and (2) verified closed by verification of air being secured upon termination of the air roll. It is feasible that only one set of solenoid valves will be tested for two consecutive months. However, every quarter a separate surveillance (other than the monthly diesel start surveillance's) will require both sets of solenoid valves to be tested.

In accordance with plant procedures, the air roll portion of the monthly surveillance is not permitted to be performed on an operable standby diesel if the other standby diesel is inoperable, since performance of the air rolls on the operable diesel requires declaring the operable diesel inoperable, thus, rendering both emergency diesel generators inoperable. Consequently, an extended diesel outage (i.e.,greater than quarterly) may cause the operable diesel air start solenoids to exceed the quarterly test requirements. In such cases, the diesel starting air solenoid valves shall be verified operable by satisfactory performance of the monthly diesel runs based on starting times only.

In summary, performance of the quarterly surveillance for diesel air rolls provides an acceptable means of verifying diesel starting air solenoid valve operability. In those situations where conformance to the Code is impracticable for the facility, such as where quarterly diesel air rolls cannot practicably be performed, monthly diesel runs shall adequately demonstrate diesel air start solenoid valve operability. Therefore, the proposed alternatives provide an equivalent level of quality and safety.

3.5.2 Alternate Testing

The licensee proposes:

At least one set of diesel starting air valves shall be verified operable during monthly diesel generator surveillance testing with both sets of diesel starting air solenoids being tested quarterly per a separate surveillance instruction.

The operability of HPCS starting air valves shall be determined by monitoring HPCS diesel starting time.

Normally, the operability of at least one set of Div. 1 and Div. 2 starting air valves shall be determined during performance of monthly air rolls by using one solenoid from each air bank and verifying diesel start times are acceptable. With both sets being tested quarterly by using one solenoid from each bank and using both the Normal and Alternate roll methods. However, air roll testing is not permitted to be performed on an operable standby diesel if the other standby diesel is already inoperable. Therefore, if one diesel remains inoperable for an extended period of time, the diesel starting air solenoid valves shall be verified operable by satisfactory performance of the monthly diesel run.

3.5.3 Evaluation

The Code requires that power-operated valves be exercised and stroke-timed every three months. The valves in this relief request are solenoid valves associated with the air start systems of the emergency and HPCS diesel generators and have a safety function to open. These valves are totally enclosed and have no external position indication. In order to measure the stroke-time of each valve, each valve would require modification or replacement. Compliance would result in a hardship on the licensee without a compensating increase in safety if there were other means to individually quantify the degradation of each individual solenoid valve.

The licensee has proposed to indirectly verify the capability of each solenoid valve on a quarterly basis through the normal testing of the emergency and HPCS diesel generators. The licensee requested a similar relief which was granted in a SE dated August 9, 1999, in which the licensee proposed that the valves would be tested by use of pre-startup and post-shutdown engine rolls on a monthly interval. The licensee stated in its February 26, 2001, submittal that this testing is now judged to be too burdensome.

The Code requires testing of Category A, B, & C valves every three months unless the testing is impractical where it can be deferred to either plant shutdowns or refueling outages. The licensee's original submittal proposed an alternate test strategy on a monthly interval. The alternate test strategy to determine degradation is based on the start time of the component's associated diesel engine. The licensee states there is a direct relationship between the performance of these valves and the starting time of the diesel engine. The NRC has accepted this basis in its August 9, 1999, SE. This submittal is now being revised to ensure that each valve is subject to one start of its associated diesel engine on a quarterly interval. Considering that the valve is actuated under design conditions, that a quantifiable, albeit indirect, acceptance criterion is being used to assess the performance of the valve, and that the NRC has accepted this method previously, the staff finds that the proposed alternative provides reasonable assurance of operational readiness.

3.5.4 Conclusion

The proposed alternative for the solenoid-operated valves listed in Section 3.5 of this SE, is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the remainder of the current 10-year interval based on the determination that compliance with the Code valve test requirements of OM-10, Paragraph 4.2.1, results in a hardship without a compensating increase in the level of quality and safety.

## 4.0 CONCLUSION

In Relief Request VR-1, relief is granted for the control rod drive hydraulic control unit scram valves to substitute scram insertion timing tests for individual valve testing pursuant to 10 CFR 50.55a(f)(6)(i) based on the impracticality of performing testing in accordance with the Code exercise requirements of OM-10, Paragraph 4.2.1, and in consideration of the burden on the licensee if the Code requirements were imposed on the facility.

In Relief Request VR-3, relief is granted for the solenoid valves listed in Section 3.2 of this SE, to exercise the ADS valves and SRVs on a staggered basis in conjunction with the 24- month TS surveillance test pursuant to 10 CFR 50.55a(f)(6)(i) based on the impracticality of

performing testing in accordance with the Code exercise requirements of OM-10, Paragraph 4.2.1, and in consideration of the burden on the licensee if the Code requirements were imposed on the facility.

In Relief Request VR-4, the proposed alternative for the check valves listed in Section 3.3 of this SE, is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the remainder of the current 10-year interval based on the determination that compliance with the Code check valve exercise requirements of OM-10, Paragraph 4.3.2, results in a hardship without a compensating increase in the level of quality and safety.

In Relief Request VR-9, the proposed alternative to the Code check valve testing requirements of OM-10, Paragraph 4.3.2, for the penetration pressurization series-pair check valves 1P53-F572B, 1F53-F573B, and 1P53-F574, is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the remainder of the current 10-year interval based on the alternative providing an acceptable level of quality and safety.

In Relief Request VR-5, the proposed alternative for the solenoid-operated valves listed in Section 3.5 of this SE, is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the remainder of the current 10-year interval based on the determination that compliance with the Code valve test requirements of OM-10, Paragraph 4.2.1, results in a hardship without a compensating increase in the level of quality and safety.

Principle Reviewer: Joseph Colaccino, NRR/EMEB

Date: June 7, 2001