

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
REQUEST FOR RELIEF FROM ASME CODE, SECTION XI
CLEVELAND ELECTRIC ILLUMINATING COMPANY
PERRY NUCLEAR POWER PLANT
DOCKET NO. 50-440

INTRODUCTION

The granting of interim approval for Revision 2 of the Perry Nuclear Power Plant IST program is predicated on compliance with the following provisions to the identified relief requests. The affected relief requests are identified followed by a paragraph which briefly states the Code requirement(s) from which relief is requested and the licensee's proposed alternative testing. This is followed by a discussion that identifies the provisions required for the relief request to be acceptable during the interim period.

Pump Relief Request PR-2

The licensee has requested relief from the Section XI, Paragraph IWP-3220, requirement to analyze pump test data within 96 hours after completion of a test and proposed to include the acceptance criteria in the test procedures and have the on-shift personnel make the initial approval of equipment operability and perform a more detailed analysis within four working days following the test (excluding weekends and holidays).

The licensee's proposed alternate testing would be acceptable during the interim period provided the on-shift personnel declare pumps whose measured parameters enter the acceptance criteria required action range inoperable in a timely manner as discussed in Generic Letter (GL) 89-04, Attachment 1, Item 8. Based upon the acceptability of the licensee's proposed alternate testing with the specified provisions, interim relief is granted pursuant to 10 CFR 50.55a(a)(3)(i).

Pump Relief Request PR-4

The licensee has requested relief from the requirements of Section XI, Paragraphs IWP-3100 and -3300, to measure pump inlet pressure both during operation and with the pumps stopped and from the flow instrumentation accuracy and acceptance criteria requirements of Paragraphs IWP-4600 and -3230, for the waterleg fill pumps for RHR, LPCS, MPCS, and RCIC. The licensee has proposed to determine the pump inlet pressures by measuring the level or pressures of the tanks from which these pumps take their suction during testing. They also proposed to use survey flow meters with accuracies of $\pm 5\%$ and to use 50% flow degradation as the alert range limit and 75% degradation as the required action range limit.

Historical pump flow rate data provided by the licensee indicates that flow rate measurements for these pumps are extremely erratic. Due to their lack of accuracy and repeatability, these measurements cannot realistically be

used to detect pump hydraulic degradation. Compliance with the Code allowable ranges would require corrective actions and declarations of inoperability for pumps that are not degraded.

Although the licensee's proposed alternate testing is not adequate for detecting degradation, it should be adequate for indicating whether the pumps are producing the differential pressure and flow necessary to meet their minimum safety requirements. For interim relief to be granted the licensee must continue recording the Code required parameters, but the pumps need not necessarily be declared inoperable or placed on an increased test frequency if the hydraulic data falls outside the Code acceptance criteria. However, the licensee must evaluate the hydraulic test results to ensure that the pumps are meeting the minimum system requirements.

The Code requirements are impractical for these pumps since there is no available instrumentation that permits taking data with the required accuracy. Imposition of the Code requirements would necessitate design changes, procurement of materials, and plant modifications to install instrumentation. This would entail a period of plant shutdown which would constitute a burden on the licensee. Pursuant to 10 CFR 50.55a(g)(6)(i), relief is granted until the end of the next refueling outage. By the end of the next refueling outage the licensee is expected to have taken the necessary actions to meet the Code acceptance criteria.

Pump Relief Request PR-7

The licensee has requested relief from the flow instrumentation accuracy and acceptance criteria requirements of Section XI, Paragraphs IWP-4600 and -3230, for the emergency service water screen wash pumps. The licensee has proposed to use survey flow meters with accuracies of $\pm 5\%$ and to use 15% flow degradation as the alert range limit and 25% degradation as the required action range limit.

Historical pump flow rate data provided by the licensee indicates that flow rate measurements for these pumps are extremely erratic. Due to their lack of accuracy and repeatability, these measurements cannot realistically be used to detect pump hydraulic degradation. Compliance with the Code allowable ranges would require corrective actions and declarations of inoperability for pumps that are not degraded.

Although the licensee's proposed alternate testing is not adequate for detecting degradation, it should be adequate for indicating whether the pumps are producing the differential pressure and flow necessary to meet their minimum safety requirements. For interim relief to be granted the licensee must continue recording the Code required parameters, but the pumps need not necessarily be declared inoperable or placed on an increased test frequency if the hydraulic data falls outside the Code acceptance criteria. However, the licensee must evaluate the hydraulic test results to ensure that the pumps are meeting the minimum system requirements.

The Code requirements are impractical for these pumps since there is no available instrumentation that permits taking data with the required accuracy. Imposition of the Code requirements would necessitate design changes, procurement of materials, and plant modifications to install

instrumentation. This would entail a period of plant shutdown which would constitute a burden on the licensee. Pursuant to 10 CFR 50.55a(g)(6)(i), relief is granted until the end of the next refueling outage. By the end of the next refueling outage the licensee is expected to have taken the necessary actions to meet the Code acceptance criteria.

Pump Relief Request PR-8

The licensee has requested relief from the flow instrumentation accuracy and acceptance criteria requirements of Section XI, Paragraphs IWP-4600 and -3230, for the diesel generator fuel oil transfer pumps. The licensee has proposed to use survey flow meters with accuracies of $\pm 5\%$ and to use 25% flow degradation as the alert range limit and 50% degradation as the required action range limit.

Historical pump flow rate data provided by the licensee indicates that flow rate measurements for these pumps are extremely erratic. Due to their lack of accuracy and repeatability, these measurements cannot realistically be used to detect pump hydraulic degradation. Compliance with the Code allowable ranges would require corrective actions and declarations of inoperability for pumps that are not degraded.

Although the licensee's proposed alternate testing is not adequate for detecting degradation, it should be adequate for indicating whether the pumps are producing the differential pressure and flow necessary to meet their minimum safety requirements. For interim relief to be granted the licensee must continue recording the Code required parameters, but the pumps need not necessarily be declared inoperable or placed on an increased test frequency if the hydraulic data falls outside the Code acceptance criteria. However, the licensee must evaluate the hydraulic test results to ensure that the pumps are meeting the minimum system requirements.

The Code requirements are impractical for these pumps since there is no available instrumentation that permits taking data with the required accuracy. Imposition of the Code requirements would necessitate design changes, procurement of materials, and plant modifications to install instrumentation. This would entail a period of plant shutdown which would constitute a burden on the licensee. Pursuant to 10 CFR 50.55a(g)(6)(i), relief is granted until the end of the next refueling outage. By the end of the next refueling outage the licensee is expected to have taken the necessary actions to meet the Code acceptance criteria.

Pump Relief Request PR-10

The licensee has requested relief from the test frequency requirement of Section XI, Paragraph IWP-3400, for the reactor core isolation cooling (RCIC) pump and has proposed to test this pump in accordance with the Perry Technical Specifications.

The licensee later determined during a telephone conference that they are able to test the RCIC pump at the Code required frequency and in accordance with the Perry Technical Specifications, therefore, this relief request is not necessary. The licensee must test the RCIC pumps to the Section XI requirements except where permitted by relief requests other than PR-10.

Pump Relief Request PR-11

The licensee has requested relief from the flow instrumentation accuracy and acceptance criteria requirements of Section XI, Paragraphs IWP-4600 and -3230, for the standby liquid control transfer pumps. The licensee has proposed to use survey flow meters with accuracies of $\pm 5\%$ and to use 15% flow degradation as the alert range limit and 25% degradation as the required action range limit.

Historical pump flow rate data provided by the licensee indicates that flow rate measurements for these pumps are extremely erratic. Due to their lack of accuracy and repeatability, these measurements cannot realistically be used to detect pump hydraulic degradation. Compliance with the Code allowable ranges would require corrective actions and declarations of inoperability for pumps that are not degraded.

Although the licensee's proposed alternate testing is not adequate for detecting degradation, it should be adequate for indicating whether the pumps are producing the differential pressure and flow necessary to meet their minimum safety requirements. For interim relief to be granted the licensee must continue recording the Code required parameters, but the pumps need not necessarily be declared inoperable or placed on an increased test frequency if the hydraulic data falls outside the Code acceptance criteria. However, the licensee must evaluate the hydraulic test results to ensure that the pumps are meeting the minimum system requirements.

The Code requirements are impractical for these pumps since there is no available instrumentation that permits taking data with the required accuracy. Imposition of the Code requirements would necessitate design changes, procurement of materials, and plant modifications to install instrumentation. This would entail a period of plant shutdown which would constitute a burden on the licensee. Pursuant to 10 CFR 50.55a(g)(6)(i), relief is granted until the end of the next refueling outage. By the end of the next refueling outage the licensee is expected to have taken the necessary actions to meet the Code acceptance criteria.

Valve Relief Request VR-1

The licensee has requested relief from the Section XI, Paragraphs IWV-3417(b) and -3523, requirements for declaring valves inoperable when they do not meet the Section XI acceptance criteria. The licensee has proposed that the plant Technical Specifications govern the declaration of component or system operability and conduct of plant start-up.

A valve that requires corrective action should be repaired and retested during the outage in which the failure is discovered if system or plant conditions will not allow retesting during plant startup. However, if a valve that requires corrective action can be repaired and retested during plant startup, then plant startup should be allowed provided that the LCOs of the plant Technical Specifications permit startup with the valve inoperable. Meeting the Code requirements in this latter situation would be impractical since the Code requirements would cause an unnecessary delay in plant startup. An unnecessary delay in plant startup would constitute a burden on the licensee.

Based on the impracticality of requiring the licensee to delay plant startup in order to repair and retest a valve which the plant Technical Specifications do not require to be operable for plant startup, interim relief may be granted from the requirements of Section XI, Paragraphs IWV-3417(b) and -3523, pursuant to 10 CFR 50.55a(g)(6)(i). However, any valve that requires corrective action which cannot be retested during plant startup shall be repaired and retested prior to plant startup.

Valve Relief Request VR-6

The licensee has requested relief from the test frequency requirements of Section XI, Paragraphs IWV-3411 and -3521, and the stroke time measurement requirement of Section XI, Paragraph IWV-3413, for the control rod drive (CRD) hydraulic control unit (HCU) valves (1C11-114, 1C11-115, 1C11-126, and 1C11-127), and proposed to test these valves by performing the Technical Specification required control rod testing.

It is impractical to test all of these valves quarterly during power operations since exercising these valves results in insertion of the associated control rod which would lead to a power reduction and possible reactor trip. The plant Technical Specifications establish the frequency for testing the control rods and these valves. Requiring the licensee to comply with the Code would be burdensome since it would result in quarterly shutdowns or possible extension of cold shutdowns as well as cause unnecessary wear on the CRDs.

The licensee's proposed alternate testing would be acceptable during the interim period provided that the reverse flow closure of the charging water header check valves (1C11-115) is verified at least during each refueling outage as discussed in Generic Letter (GL) 89-04, Attachment 1, Item 7. Based on the impracticality of testing to the Code requirements, the burden that compliance would place on the licensee, and considering the alternate testing with the above provision, interim relief should be granted pursuant to 10 CFR 50.55a(g)(6)(i).

Valve Relief Request VR-11

The licensee has requested relief from the test frequency requirements of Section XI, Paragraphs IWV-3411 and -3521, and the stroke time measurement and fail-safe verification requirements of Section XI, Paragraphs IWV-3413 and -3415, for the main steam isolation valve (MSIV) operator control solenoid valves and the air supply check valves for the MSIV operator air accumulators, and proposed to test these valves by exercising the MSIVs during cold shutdowns.

It is impractical to test these valves quarterly during power operations because it would be necessary to either cycle the associated MSIV or to remove it from service. Closing an MSIV during power operations would cause a reduction in steam flow and a reactor trip. Removing an MSIV from service to verify the reverse flow closure of the air supply check valves would result in entering a Technical Specification LCO Action Statement with a relatively short time period.

The solenoid control valves are exercised each time the associated MSIV is tested during cold shutdowns. Significant degradation of these solenoid valves would show up in a change in the stroke time of the MSIV which is required by Technical Specifications to close between 3 to 5 seconds. Cold shutdown testing of these solenoid control valves is in compliance with the requirements of Section XI, Paragraph IWV-3412, therefore, relief is not necessary for these valves.

The air supply check valves can be exercised open during the MSIV tests at cold shutdowns, however, it is impractical to verify their reverse flow closure during cold shutdowns since this can only be accomplished by leak testing or an accumulator pressure drop test which requires taking portions of the air system out of service and entering the drywell which may be hazardous to personnel. Compliance to the Code test frequency requirements would be burdensome to the licensee because drywell entry activities and air system isolation could delay restart from a cold shutdown.

The licensee's proposed alternate testing would be acceptable during the interim period provided that the air supply check valves are verified to exercise open by observing the recharging of the air accumulators after the MSIVs are exercised during cold shutdowns. Also, the reverse flow closure of these check valves must be verified at least once each refueling cycle by performing a leak test or an accumulator pressure decay test. Based on the impracticality of testing to the Code requirements, the burden that compliance would place on the licensee, and considering the alternate testing with the specified provisions, interim relief should be granted for the air supply check valves pursuant to 10 CFR 50.55a(g)(6)(i).

Valve Relief Request VR-15

The licensee has requested relief from the test frequency requirements of Section XI, Paragraphs IWV-3411 and -3521, for the containment and drywell air lock air accumulator supply check valves and air lock door equalizing ball valves, and proposed to test these valves by seal pressurization and equalizing pressure across the air lock door during normal door cycling which occurs at least quarterly for the containment air locks and during cold shutdowns, not more frequently than once every six months, for the drywell air lock.

The containment air lock valves are exercised open each time the associated air lock is opened, which occurs at least once each quarter. The manual ball valves are tested to the Code requirements, therefore, relief is not necessary. It is impractical to verify the reverse flow closure of the check valves during cold shutdowns since this can only be accomplished by leak testing or an accumulator pressure drop test which requires taking portions of the air system out of service and entering containment.

It is impractical to test the drywell air lock valves quarterly during power operations because it would be necessary to open the air lock. There are administrative controls that prevent opening this air lock during power operation. The drywell air lock ball valves can be cycled and the check valves exercised open during cold shutdowns. Exercising the manual ball valves during cold shutdowns conforms with the requirements of IWV-3412, therefore, relief would not be necessary. Compliance with the Code test

frequency requirements of IWV-3522 for the check valves would be burdensome to the licensee because testing the reverse flow closure of these valves during cold shutdowns would require taking the air locks out of service and isolating the air supply header which could result in a delay in startup from cold shutdown.

The licensee's proposed alternate testing would be acceptable during the interim period provided that the air supply check valves are verified to exercise open by observing that a low seal pressure alarm is not actuated when the air lock doors are cycled. This testing must be performed at least quarterly for the valves associated with the containment air locks and during cold shutdowns for the valves associated with the drywell air locks. Also, the reverse flow closure of these check valves must be verified at least once each refueling cycle by performing a leak test or an accumulator pressure decay test. Based on the impracticality of testing to the Code requirements, the burden that compliance would place on the licensee, and considering the alternate testing with the specified provisions, interim relief should be granted pursuant to 10 CFR 50.55a(g)(6)(i).

Valve Relief Request VR-16

The licensee has requested relief from the test frequency requirement of Section XI, Paragraph IWV-3521, for the air supply header isolation check valve for the MSIV operator air accumulators, and proposed to test this valve by exercising the MSIVs during cold shutdowns.

The licensee's proposed alternate testing would be acceptable during the interim period provided that the air supply check valve is verified to exercise open by observing that the pressure of the air header downstream of this valve remains constant or is restored after the MSIVs are exercised during cold shutdowns. Section XI, Paragraph IWV-3522, permits cold shutdown testing when it is impractical to full-stroke exercise check valves quarterly during power operations. Provided the licensee performs their proposed testing in accordance with the above verification during cold shutdowns, this relief request is not necessary.

Valve Relief Request VR-26

The licensee has requested relief from the test frequency requirement of Section XI, Paragraph IWV-3521, for the twenty check valves listed in their relief request, and proposed to disassemble, inspect, and manually exercise these valves on a sampling basis during refueling outages.

The grouping and sample disassembly/inspection criteria for refueling outage disassembly, inspection, and manual exercising of these valves is contained in Generic Letter (GL) 89-04, Attachment 1, Item 2. The ASME Code Section XI, Paragraph IWV-3522, states in part that "Check valves shall be exercised to the position required to fulfill their function unless such operation is not practical during plant operation. If only limited operation is practical, during plant operation the check valve shall be part-stroke exercised during plant operation...." This requirement of IWV-3522 applies to exercising to both the open and closed valve positions as necessary for the valve to fulfill all of its intended safety functions.

The licensee stated that "system design inhibits the verification of full open during flow testing due to orientation or system limitations." Therefore, it is impractical to full-stroke exercise these valves quarterly or during cold shutdowns per the guidelines of Generic Letter 89-04, Attachment 1, Item 1. Substantial plant modifications would be required to install full-flow test paths for these valves to permit them to be full-stroke exercised with flow. Requiring these modifications would be burdensome to the licensee.

The licensee's proposed alternate testing would be acceptable during the interim period on the condition that the above provisions with respect to disassembly/inspection and part-stroke exercising during plant operation are followed. Based on the impracticality of testing to the Code requirements, the burden that compliance would place on the licensee, and considering the alternate testing with the specified provisions, interim relief should be granted pursuant to 10 CFR 50.55a(g)(6)(i).

Valve Relief Request VR-32

The licensee has requested relief from the test frequency requirements of Section XI, Paragraphs IWV-3411, and the stroke time measurement and fail-safe verification requirements of Section XI, Paragraphs IWV-3413 and -3415, for the diesel generator air start solenoid valves, and proposed to verify these valves operable during the monthly diesel generator Technical Specification surveillance testing.

The licensee has determined that the air operated valves that admit starting air to the diesel generators should be included in the IST program and added to Valve Relief Request VR-32. This action is considered appropriate and acceptable.

It is impractical to measure the stroke times of these valves because they are totally enclosed solenoid or air operated valves which have no externally visible indication of valve position. Further, there is no way to determine when a valve receives a signal to open or when it reaches the open position. These valves are rapid acting valves which normally stroke almost instantly and when they do not operate promptly, they most commonly fail to operate at all.

Since there are redundant air start trains with redundant start valves in each train, normal diesel testing may not verify the operability of each air start valve. In order to ensure that each valve is exercised, it would be necessary to disable all but one air start valve on an alternating basis during diesel tests, which could result in damage to the diesel and unnecessary wear if retesting is required, therefore, requiring conformance to this Code requirement would be burdensome to the licensee.

The licensee's proposed alternate testing would be acceptable during the interim period provided that at least once each quarter the operability of each valve is verified by performing air rolls of the diesel generators using separate air start trains and observing system parameters for appropriate response. The licensee should monitor for valve degradation during the periodic diesel tests by observing the diesel start times and comparing air receiver tank pressures. The licensee should investigate any significant

difference between the two air receiver tank pressures following each diesel test and take corrective actions where appropriate.

Based on the impracticality of testing to the Code requirements, the burden that compliance would place on the licensee, and considering the alternate testing, interim relief should be granted pursuant to 10 CFR 50.55a(g)(6)(i) provided the guidance in the preceding paragraph is followed.