



**CENTERIOR
ENERGY**

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U. S. Nuclear Regulatory Commission
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Perry Nuclear Power Plant
Docket No. 50-440
Inservice Testing Program For
Pumps and Valves - Resolution of
Issues from Safety Evaluation
(TAC No. M74784)

Gentlemen:

The purpose of this correspondence is to address several open issues involving the Perry Nuclear Power Plant (PNPP), Unit 1, 10 Year Pump and Valve Inservice Testing (IST) Program Plan which were identified in the Nuclear Regulatory Commission's (NRC) April 5, 1993 Safety Evaluation (SE) regarding this program. Specifically, this correspondence (1) provides actions to resolve the anomalies identified in Appendix A of the Technical Evaluation Report (TER) associated with the SE, (2) documents the actions taken in response to recommendations identified in the TER which were not encompassed in Appendix A, and (3) provides a copy of the PNPP IST program which has been revised to incorporate the resolution of these and other related issues. Because the resolution of these issues results in conformance of the program to Code requirements and previously approved relief requests, the documentation contained herein is provided for information only.

Resolution of Anomalies Identified in Appendix A of the TER

By letter dated July 31, 1991, Revision 3 of the Perry Nuclear Power Plant, Unit 1, 10 Year Pump and Valve Inservice Testing Program Plan, including associated relief requests, was submitted to the NRC. By letter dated April 5, 1993, the NRC issued the SE for the requested reliefs which incorporated TER EGG-NTA-10023, prepared by EG&G Idaho, Incorporated. Appendix A of the TER identified anomalies necessitating action. The acceptability of the approved relief requests was contingent upon providing information to NRC regarding proposed actions to resolve the anomalies in Appendix A by April 5, 1994, and implementation actions, including programs and procedure changes, to resolve the anomalies being complete by April 5, 1994, or by the end of the next refueling outage, whichever is later. These and other issues were the subject of a meeting between the NRC staff and PNPP personnel in Rockville, MD on September 2, 1993.

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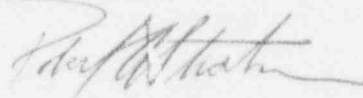
Accordingly, Attachment 1 provides the information requested addressing each of the anomalies from Appendix A of the TER. The actions taken to resolve some of the anomalies include changes to previously approved relief requests and a previously reviewed cold shutdown justification. In these cases the involved relief requests and the cold shutdown justification have been modified to conform to the provisions or limitations specified in the SE and TER. The modified relief requests and cold shutdown justification are included in the revised IST Program Plan provided as Attachment 3. Procedure changes to implement the modifications to the program plan will be completed by the end of refueling outage 4 (RF04) which is currently in progress.

Actions Taken in Response to Recommendations Identified in the TER

Embedded in the TER were recommendations for studies and feasibility determinations. These recommendations were not addressed in the anomalies identified in Appendix A of the TER. Each recommendation has been evaluated and a response has been developed to address the recommendation. Attachment 2 provides these responses. As discussed in the September 2, 1993 meeting with the staff, these responses are being provided for information.

If you have questions or require additional information, please contact Henry Hegrat - Regulatory Affairs at (216) 280-5606.

Very truly yours,



RAS:TEC

Attachments

cc: NRC Project Manager
NRC Resident Inspector Office
NRC Region III

Actions to Resolve Anomalies

The following discussions document the actions taken to resolve the anomalies identified in Appendix A of the TER. Where the resolution indicates the associated relief requests or refueling outage justifications (ROs) have been revised to incorporate the resolution, the modified relief request or ROs are included in the revised IST Program Plan (Attachment 3). (Note: The anomaly statement is directly extracted from the SE/TER.)

Anomaly 1. PR-4 requests relief from monitoring pump inlet pressure as required by the Code for the waterleg fill pumps (see Section 2.2.1.1 of this report). The licensee proposes to calculate the running suction pressure by using the suppression pool level, for RHR and LPCS, and condensate storage tank level and pressure for HPCS. The licensee's proposal to calculate or measure the running inlet suction pressure of the waterleg fill pumps should provide a means to monitor for pump hydraulic degradation. The licensee's proposed alternative should be authorized pursuant to §50.55a ¶(a)(3)(ii) provided the licensee's calculations of inlet pressure are at least as accurate as would result from installed instrumentation meeting the Code accuracy requirements.

Resolution The calculated inlet pressures have been determined to be at least as accurate as would result from installed instrumentation meeting the code accuracy requirements.

Anomaly 2. PR-6 requests relief from the inlet pressure measurement requirements of the Code for the ESW pumps (see Section 2.5.2.1 of this report). It is impractical to measure inlet suction pressure for these pumps because they are submerged in the inlet in the intake bays and do not have installed instruments. The licensee proposes to calculate inlet pressure using the height of fluid above the pump suction. Measuring the height of fluid above the pump suction and calculating inlet pressure can be a reasonable alternative to the Code requirements. Relief should be granted provided the calculations are within the accuracy that would result from installed instrumentation meeting the code accuracy requirements.

Resolution The calculated inlet pressures have been determined to be within the accuracies that would result from installed instrumentation meeting the code accuracy requirements.

Anomaly 3 VR-1 requests relief from the Code corrective action requirements for all valves in the IST program and proposes to use PNPP TS for operability criteria (see Section 3.1.1.1 of this report). The station TS specify the component and systems needed to allow continued safe operation or to choose the plant operational mode. However, the TS do not explicitly address all the tests and acceptance criteria for each safety related component. Therefore, as regards operational readiness, components that exceed the required action limits specified in either the Code or TS are inoperable. Relief should not be granted for the Code operational

Actions to Resolve Anomalies

readiness requirements of IWV-3417(b) and -3523. The licensee's request also addresses the Code start-up criteria and is authorized pursuant to §50.55a ¶(a)(3(ii)).

Resolution

VR-1 has been modified to eliminate the proposed alternative testing involving component or system operational readiness. As a result, the modified VR-1 currently includes only the approved relief to use the TS to specify start-up criteria.

Anomaly 4

VR-26 requests relief from the test method and frequency requirements for the valves listed in tables 1 and 2 in the IST program and proposes to group the valves and perform sample disassembly and inspection during refueling outages (see Section 3.1.3.1 of this report). The staff finds that the basis provided by the licensee to relax the test method and frequency requirements is not in sufficient detail to justify this request. The licensee should resubmit this request with additional bases providing the details for not testing quarterly and during cold shutdowns and for not using the test method as required by the Code. Relief cannot be granted based on the information provided. The reasons must be presented clearly and thoroughly and specifically address technical concerns such as damage to equipment, loss of containment integrity or safety system function during operation, hazards to personnel, or the possibility of a plant trip that would unnecessarily challenge safety systems, stress components, and cycle equipment. Personnel radiation exposure concerns should contain information about the general area radiation fields, local hot spots, plant radiation limits and stay times, and the amount of exposure personnel performing the test would receive. The licensee should investigate the use of alternative testing methods to verify the valves will open and/or close. The licensee's investigation should consider non-intrusive diagnostic techniques such as magnetics, acoustics, ultrasonics and radiography. The licensee may also consider as necessary installation of test connections or other system modifications to meet the Code requirements.

Some Table 2 valves are located in series with other check valves with no available test connections between the valves for verifying the closure of each valve. The staff has determined that, in cases where closure of one check valve in a series pair is sufficient to meet system requirements, testing the series pair as a unit provides adequate assurance of the pair's capability to perform its safety function. Leak testing these series check valve pairs as a unit provides reasonable assurance of operational readiness provided that when excessive leakage through the pair is detected, both valves are repaired or replaced as necessary. If this testing is found to be applicable for any of the valves, the licensee should include in the resubmittal information regarding system requirements for component redundancy and regarding corrective actions for excessive leakage that would be necessary to obtain staff approval of leak testing the series check valves as a unit.

Actions to Resolve Anomalies

- Resolution The disposition of the valves listed in VR-26 has been separately addressed in correspondence to the NRC dated February 2, 1994, (PY-CEI/NRR-1739L).
- Anomaly 5 VR-41 requests relief from the Code test frequency requirements for the various Category A/C check valves listed in the relief request (See Section 3.1.4.3 of this report). The licensee proposes to verify their normally closed position in conjunction with leak testing once every 2 years. Based on the review of the system prints, it appears that RCIC system check valves, 1E51-F021 and -F040, are equipped with sufficient test taps and isolation valves and can be verified closed during cold shutdowns without imposing an excessive burden or hardship on the plant staff. Therefore, valves 1E51-F021 and -F040 should be reverse flow tested during cold shutdowns, when portions of the system can be isolated, as required by the Code. Relief should be granted as requested pursuant to §50.55a ¶(f)(6)(i) for all valves listed in the relief request except RCIC check valves, 1E51-F021 and -F040.
- Resolution VR-41 has been revised to remove the 1E51-F021 and -F040 valves. Although sufficient test connections exist to leak test these two valves as indicated in the anomaly, the location of the valves and the test connections require entry to a high radiation area. OM-10 recognizes the limitations of performing testing during power operation and cold shutdown outages and permits testing to be performed during refueling outages for those valves which cannot otherwise be practically exercised. This testing is not practical to perform during cold shutdown outages because installation and removal of test equipment could delay plant startup. Consequently, it has been determined that testing these valves during power operation or at cold shutdown is impractical. RO-7, in accordance with OM-10 provisions, has been prepared to document the basis for this conclusion.
- Anomaly 6 VR-5 requests relief from the Code test method and frequency requirements for the ADS and SRVs (See Section 3.2.1.1 of this report) and proposes to exercise these valves during refueling outages without measuring their stroke times. Measuring the stroke times of these valves is difficult, however, some method of assessing changes in the conditions of these valves is needed to adequately evaluate their operational readiness. Alternate methods of judging the condition of these check valves should be considered, including non-intrusive diagnostic techniques, such as magnetics, ultrasonics, radiography, or acoustics. The licensee's proposal to exercise these valves each refueling outage provides a reasonable assurance of operational readiness for the short term. However the proposal does not adequately address valve operational readiness for the long term. Relief should be granted as requested pursuant to §50.55a ¶(f)(6)(i) for a period of one year or until the next refueling outage, whichever is longer. During this period, the licensee should develop and implement a method of measuring stroke times or otherwise adequately monitoring the condition of these valves for the long term.

Actions to Resolve Anomalies

- Resolution This issue has been further evaluated with the conclusion being that measurement of the stroke times for these valves in addition to the other testing specified for safety-relief valves is not justified. The requirement for this testing is based upon the dual classification of these valves as category A in addition to their classification as category C.
- This issue has been pursued by preparing and submitting a Code Inquiry to the Operations and Maintenance (O&M) Committee. Preliminary discussions at the Code Committee meeting in September, 1993 indicated that the Main Steam Relief Valves should be categorized as "C" only. Pending final determination by the O&M committee, the Main Steam Relief valves have been reclassified in the PNPP IST Program Plan as category "C" only and VR-5 has been deleted.
- Anomaly 7 VR-11 requests relief from the Code fail-safe and stroke time testing requirements for air supply valves to the MSIV operators (See Section 3.2.1.1 of this report). The licensee proposes to exercise them at cold shutdown during exercising of the MSIVs without timing each valve's stroke. Relief should be granted pursuant to §50.55a ¶(f)(6)(i) provided that upon failure of an MSIV to meet its stroke time criteria, the associated solenoid valves are evaluated to determine if corrective action should be taken per ¶IWV-3417(b).
- Resolution VR-11 has been revised to include performing the specified evaluation of the solenoid valves.
- Anomaly 8 VR-20 requests relief from the Code test frequency, stroke time, and valve position indication accuracy requirements for the supply air solenoid operated valves to the air operators for the ADS and SRVs listed in the relief request (See Section 3.2.2.2 of this report). The licensee proposes to exercise, fail-safe test, and verify position indications of these valves once every other refueling outage. There are two of these solenoid valves for each main valve. Testing of both of these valves would require two main valve cycles. The licensee has not shown that the extended test frequency is appropriate for these valves. But, a sampling approach, such as that used for safety and relief valve tests might be proper. Relief should be granted as requested pursuant to §50.55a ¶(f)(6)(i) provided the licensee employs a sampling program, such that if one of the tested solenoid fails during refueling outage testing, the remaining solenoid valves are tested during that outage.
- Resolution A testing methodology has been developed which tests both solenoid valves with only one cycle of the main valve. Since both solenoid valves will be tested each refueling outage, the specified provision to test the remaining solenoid valves is satisfied.

Actions to Resolve Anomalies

Anomaly 9 VR-19 requests relief from assigning and analyzing individual leakage rates as required by the Code to the CIVs listed in tables 1 and 2 of the relief request (See Section 3.4.1.1 of this report). The licensee proposes to test them in groups. The group leakage rate limit for valves in Table 1 is based on the smallest valve of the group. For valves in table 2, the limits are based on the penetration size. The licensee's testing is essentially equivalent to the Code and provides an acceptable level of quality and safety, the proposed alternative should be authorized pursuant to §50.55a ¶(a)(3)(i) to test CIVs in groups provided the licensee complies with the requirements of OMa-1938, ¶4.2.2.3, for leakage limits and corrective action for the valve group.

Resolution The basis for relief has been revised to specify the method for seat leakage measurement (consistent with OM-10, ¶4.2.2.3(c), Seat Leakage Measurement) and to specify the corrective actions for the valve group (consistent with OM-10, ¶4.2.2.3(f), Corrective Action). Since the approval of this relief request is based on the utilization of OM-10 permitted testing, VR-19 has been replaced with OM(10)-2. {Note: An OM(10) is a program element which specifies alternative testing in accordance with OM-10 and provides the basis for alternative testing.}

Anomaly 10 VR-35 requests relief from the Code corrective action requirements for the containment vessel and drywell purge system CIVs (See Section 3.5.1.1 of this report). The licensee proposes to assign them a maximum stroke time limit of four seconds and if the limit is exceeded, the valve(s) will be declared inoperable and be repaired or replaced. The licensee has experienced deviations of stroke times for these valves of greater than 50% without any valve degradation. This places the valves on an increased test frequency, which causes an unnecessary increase in the wear on this valve. The licensee's proposed testing gains some information about these valves and is a reasonable method for an interim period of one year or longer or until the next refueling outage whichever is longer. However, it may not adequately assess valve operational readiness and be reasonable for the long term. Some method of accurately timing or otherwise evaluating the valve condition is necessary for adequately determining the operational readiness of these valves. The proposed alternative should be authorized pursuant to §50.55a ¶(a)(3)(ii) for an interim period of one year or until the next refueling outage, whichever is longer. During this time the licensee should investigate alternatives and develop and implement a method of accurately measuring the stroke times and applying the code acceptance criteria or otherwise adequately monitoring the condition of these valves.

Resolution The basis for VR-35 has been revised to provide additional information and justification for the requested relief. Included in this additional information is clarification that the timing variability previously observed is not solely the result of timing inaccuracies. VR-35 has been resubmitted to NRC for permanent

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(i.e., non-interim) approval based on the additional information provided. This information was provided by correspondence dated February 2, 1994 (PY-CEI/NRR-1739L).

Anomaly 11

VR-8 requests relief from the Code test frequency, full-stroke exercise time, and valve position verification requirements for the RCIC turbine governing valve (See Section 3.5.1.1 of this report). The licensee proposes to verify proper operation by turbine response during turbine testing. This valve is difficult to test using conventional methods. However, the licensee has not shown that the turbine test is adequate or equivalent to the Code specified tests, and therefore, the test may not be adequate for the long term. However, relief should be granted for an interim period. Interim relief should be granted as requested pursuant to §50.55a (f)(6)(i) for a period of one year or until the next refueling outage, whichever is longer. During that period, the licensee should investigate the current turbine testing or diagnostic testing techniques and determine an adequate method of assessing the operational readiness of this valve as required by the code.

Resolution

VR-8 has been deleted from the program. The RCIC governor valve will remain in the Inservice Test Program identified as a skid mounted component used for pressure control with no full stroke safety function.

Anomaly 12

The IST program does not include a description of how the components were selected and how testing requirements were identified for each component. The review performed for this Safety Evaluation (SE)/TER did not include verification that all pumps and valves within the scope of 10 CFR 50.55a and Section XI are contained in the IST program, and did not ensure that all applicable testing requirements have been identified. Therefore the licensee is requested to include this information in the IST program. The program should describe the development process, such as a listing of the documents used, the method of determining the selection of components, the basis for the testing required, the basis for categorizing valves, and the method or process used for maintaining the program current with design modification or other activities performed under 10 CFR 50.59.

Resolution

The elements described in the anomaly are contained in numerous documents, references and procedures, each of which plays a part in the overall development and maintenance of the PNPP IST Program Plan. Most of the elements are a part of overall work process, design review and management controls. Although the ISTP is dependent upon and integrated with the overall programs, the control and maintenance of these processes are independent of the ISTP. Based upon these considerations, including program development and maintenance descriptions as part of the ISTP is considered to be unnecessary. This issue was discussed at the September 2, 1993 meeting with the staff. Based upon this meeting, agreement was reached to provide a listing of plant procedures and

Actions to Resolve Anomalies

other documents used to develop and maintain the ISTP.

Accordingly, the following document listing is provided:

Title 10, Code of Federal Regulations, Part 50,
Paragraph 50.55a

10CFR50, Appendix J, Primary Reactor Containment Leakage
Testing.

ASME Boiler and Pressure Vessel Code, Section XI (rules for
inservice inspection of nuclear power plant components) 1983
edition through Summer 1983 Addenda, Subsections IWV and IWP.

NRC Regulatory Guides Division 1.

"NRC Staff Guidance for Preparing Pump and Valve Testing
Programs and Associated Relief Request," November, 1981.

Generic Letter 89-04, Guidance on Developing Acceptable
Inservice Testing Program.

Minutes of the Public Meeting to Discuss Generic Letter 89-04.

Plant piping and instrument diagrams (P&ID's). (The inservice
testing (IST) program was developed based upon the ISI safety
classification boundaries.)

Perry Operations Manual (OM)7E, Pump and Valve Inservice
Testing Program Plan

Updated Safety Analysis Report, Perry Nuclear Power Plant.

Technical Specifications, Perry Nuclear Power Plant.

NRR Safety Evaluations Involving Inservice Testing and any
associated TERS.

Perry Plant Unit 1 Pump and Valve Inservice Testing Program
submittals to the Nuclear Regulatory Commission (Letter No.
PY-CEI/NRR-0318L, Letter No. PY-CEI/NRR-0445L, Letter No.
PY-CEI/NRR-0618L, Letter No. PY-CEI/NRR-0716L, and Letter
No. PY-CEI/NRR-1368L).

Perry Administrative Procedure (PAP)-0205, Operability of
Safety Systems.

PAP-0507, Preparation, Review, and Approval, of Instructions.

PAP-0517, Preparation of Technical Specification Surveillance
Instructions.

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PAP-0903, Repetitive Task Program.

PAP-1101, Inservice Testing of Pump and Valves

PAP-1105, Surveillance Test Control.

Perry Operations Procedure (POP)-1001, Inservice Inspection Program.

Anomaly 13

VR-37 requests relief from the test frequency requirements of Section XI, ¶IWV-3521, for drywell and containment vacuum relief check valves 1M16-F020A, -F020B, 1M17-F010, -F020, -F030, AND -F040. The licensee states that a full-stroke exercise testing interval more stringent than every refueling outage would result in a hardship by increasing the radiation exposure without a compensating increase in the level of quality and safety. The basis provided by the licensee is not in sufficient detail to justify the proposed test frequency (See Section 3.5.2.1 of this TER).

The ANSI/ASME OMA-1988 Part 10, which was approved by 10 CFR 50.55a,b) rulemaking, allows an exercising frequency of every refueling outage if higher frequency is impracticable. Pursuant to 50.55a(f)(4)(iv), relief is not required provided the licensee implements all safety related requirements of OM-10, or portions thereof. Whether all related requirements are met is subject to NRC inspection. The licensee should expand the basis so it is evident that full-stroke exercising at higher frequency is impracticable. If the valves in question cannot be exercised in accordance with all related requirements of OM-10, or portions thereof, this relief request should be resubmitted with additional bases.

Resolution

The quarterly exercise of these valves using the pneumatic actuator is a full stroke test. The requested relief involved the measurement of force required to operate the valve at the quarterly frequency. The valves are stroked in accordance with TS requirements monthly. The requested relief was to permit the measurement of the differential pressure required to open the valve to be performed at the refueling frequency as specified by the TS.

The applicable exercise requirements of OM-10 for these vacuum breakers is ¶4.3.1. This paragraph specifies that safety and relief valves shall meet the inservice test requirements of Part 1 (OM-1). The OM-1 specified test frequency for vacuum breakers is every 6 months. Consequently, an OM(10) justification has been prepared to specify the measurement of the differential pressure required to open the valve will be performed every 6 months. The valves will continue to be full stroke exercise tested every month as specified by the TS.

Anomaly 14

PR-9 requests relief from the test frequency requirements of Section XI, ¶IWP-3400(a), for the ECCS waterleg fill pumps, 1E12-C003, 1E21-C002, 1E22-C003, and 1E51-C003. The licensee proposes to test

Actions to Resolve Anomalies

these pumps at cold shutdowns. The Code requires quarterly testing of safety-related pumps to verify their operational readiness. The waterleg fill pumps are running during power operation to maintain a positive pressure in the associated ECCS piping. The pressure in the ECCS piping is monitored and a low pressure condition is alarmed in the control room. The waterleg fill pumps are operating at minimum flow which is close to shutoff head, during power operations; therefore, a meaningful flow rate cannot be measured to evaluate pump hydraulic conditions. However, some useful information may be obtained by measuring the as-found pump discharge pressure and/or pump bearing vibration quarterly. The licensee should evaluate this testing and determine if it is practicable. If quarterly discharge pressure measurements or bearing vibrations are found to be practicable and monitoring these parameters does not constitute a hardship without a compensating increase in the level of safety, these parameters should be taken. If not the licensee should document the basis for not performing this testing in their IST program.

Resolution

PR-9 has been revised to specify that discharge pressure and bearing vibrations for the ECCS keep fill pumps are included in quarterly testing of these pumps. These parameters will be evaluated to assess the pumps mechanical performance.

Responses to Embedded Recommendations from TER

- 1 - Recommendation (PR-3) The licensee should document the results of a study that demonstrates that these pumps are not susceptible to degradation mechanisms that result in increased vibration levels primarily seen at frequencies below the pumps rotational speed frequency, such as looseness of the bearings.
- Response This recommendation has been evaluated with the conclusion indicating such a study is not justified. Industry, Code Committee, and Commission sponsored events are frequently attended to maintain cognizance of activities and advances in this area. Developments will be monitored for the purpose of determining the feasibility of utilizing improved vibration monitoring technology during the upcoming interval upgrade. Future purchases of vibration equipment for monitoring Code vibration points will conform to applicable code requirements for frequency response.
- 2 - Recommendation (PR-3) When new or replacement vibration instruments are obtained in the future, these instruments should meet all applicable Code requirements.
- Response Future purchases of vibration equipment for monitoring Code vibration points will conform to applicable code requirements for frequency response.
- 3 - Recommendation (PR-5) Future advances in techniques and equipment may improve the capability to accurately monitor the mechanical condition of vertical line shaft pumps. The licensee should follow developments in this area and employ improved vibration testing for these pumps when it is feasible.
- Response Industry, Code Committee, and Commission sponsored events are frequently attended to maintain cognizance of activities and advances in this area. Information obtained through such activities is generally considered for implementation as programs and procedures are maintained and updated.
- 4 - Recommendation (VR-11) New diagnostic techniques are being developed to allow an improved assessment of solenoid-operated valves. These developments should be monitored for their applicability to testing of these valves in the future.
- Response Industry, Code Committee, and Commission sponsored events are frequently attended to maintain cognizance of activities and advances in this area. Information obtained through such activities is generally considered for implementation as programs and procedures are maintained and updated.
- 5 - Recommendation (VR-17) The licensee should evaluate the use of non-intrusive techniques (e.g., magnetics, ultrasonics, thermography, and radiography) or monitoring system parameters such as pressure, to determine if it is feasible to use one or more

Responses to Embedded Recommendations from TER

of these techniques to verify the closure of any of these valves quarterly or during cold shutdowns. If it is feasible to perform this testing at the Code frequency, this testing should be performed. The results of this study should be documented in the licensee's program.

Response

Closure verification using non-intrusive testing techniques has been evaluated and found to be of no benefit for these valves. The check valves involved with this relief request are normally open with flow maintained through the associated lines. Due to operational restrictions, the systems cannot be shutdown to permit valve closure except during extended outages. VR-17 has been revised to provide additional information regarding these operational restrictions.

6 - Recommendation
(VR-34)

If the licensee determines a non-intrusive method or monitoring of system parameters would allow for verification of closure of these valves at the Code frequency, this change to the IST program should be implemented.

Response

This recommendation only involves the four check valves included in this relief request. (These valves are 1E51-F065, 1E51-F066, 1E12-F019 and 1E12-F550).

1E51-F065 and 1E51-F066 were determined to be testable using existing plant instrumentation during cold shutdowns and were incorporated into CS-10.

Closure verification using non-intrusive testing techniques has been evaluated and found to be of no benefit for the remaining two check valves. The check valves involved with this relief request are maintained closed during operation or non extended outages. Due to operational restrictions, valve exercising open to demonstrate valve closure cannot be performed except during extended outages. (Note: 1E12-F019 has been relocated to VR-14.)

7 - Recommendation
(VR-41)

The licensee should evaluate the use of non-intrusive techniques (e.g., magnetics, ultrasonics, thermography, and radiography) or monitoring system parameters such as pressure, to determine if it is feasible to use one or more of these techniques to verify the closure of any of these valves quarterly or during cold shutdowns. If it is feasible to perform this testing at the Code frequency, this testing should be performed. The results of this study should be documented in the licensee's program.

Responses to Embedded Recommendations from TER

Response

Check valves 1E51-F021 and 1E51-F040 were determined to be testable for closure verification at a refueling frequency and were added to RO-7. Check valves 1E12-F041A, -F041B, -F041C, 1E12-F006, and 1E22-F005 were determined to be testable for closure verification at cold shutdown and were added to CS-10.

This recommendation involves evaluation of non-intrusive testing techniques similar to recommendations made in the TER evaluation for VR-17 and VR-34. These recommendations were discussed in the September 2, 1993 meeting with the NRC staff on a generic basis. It was indicated by PNPP personnel that there was no intention to perform any detailed or complex review and/or evaluation. The staff was asked to clarify what, if anything, was intended or expected to close these issues. The staff indicated that there was no intent for this recommendation to be a major impact or result in a significant expenditure of resources. Nor was there any expectation that there would be a formal review and/or closure by the NRC. Additionally the staff indicated that there was no specific result intended or desired. PNPP personnel identified the existing capability to utilize acoustic monitoring technology as part of the check valve program, however for the remaining check valves associated with this relief request, there was no plan to do any formal evaluation of the potential for use of acoustics or other non-intrusive testing techniques in the testing of these valves. The staff did not indicate any concerns with this approach.

Attachment 3

Perry Nuclear Power Plant, Unit 1, 10 Year
Pump and Valve Inservice Testing Program Plan