UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

THIRD INTERVAL INSERVICE TESTING PROGRAM REQUESTS FOR RELIEF

CONSUMERS POWER COMPANY

PALISADES NUCLEAR PLANT

DOCKET NUMBER 50-255

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 relief has been requested by the licensee and alternatives authorized or relief granted by the Commission pursuant to Sections (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. NRC guidance contained in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," provided alternatives to the Code requirements determined acceptable to the staff. Further guidance is given in NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants," issued April 1995, as referenced in GL 89-04, Supplement 1.

Section 50.55a of 10 CFR Part 50 authorizes the Commission to grant relief from ASME Code requirements upon making the necessary findings. The NRC staff's findings with respect to granting or not granting the relief requested as part of the licensee's IST program are contained in this Safety Evaluation (SE).

2.0 BACKGROUND

By letter dated March 5, 1996, Consumers Power Company (CPCo) submitted the third 120-month interval IST program for the Palisades Plant. The third 120-month interval began August 21, 1995, following completion of the Cycle 11 refueling outage for the plant. The previous intervals were extended beyond 120 months under the provisions of IWA-2400(c) of the ASME Code. The current Palisades Plant IST Program was developed to the 1989 Edition of Section XI of the ASME Code in accordance with 10 CFR 50.55a(f)(4)(ii). The commercial operation date for the Palisades Plant was December 31, 1971.

The NRC reviewed pump Relief Request 4 relating to pump vibration for the third 120-month interval and issued an SE dated October 12, 1995. Additionally, in a letter dated May 17, 1996, the NRC indicated the acceptability of an interim period of relief for completing installation and calibration of the new flow instrumentation for the boric acid pumps (reference licensee's letter of April 4, 1996), and no further NRC action is required. This SE completes the NRC's review of the outstanding IST relief requests submitted for the third 120-month interval.

The NRC issued an SE April 20, 1995, concerning certain relief requests for the second 120-month interval. The NRC requested that the licensee review the staff's SE of the relief requests and the comments on further actions given in the summaries of the licensee's action (Table 1 and Table 2 of the April 1995 SE) and make changes in the IST program developed for the third 10-year interval in 1995. Where appropriate, the licensee's actions have been reviewed as part of the review of third interval relief requests.

3.0 EVALUATION OF VALVE RELIEF REQUESTS

The relief request numbers were carried over from the second 10-year interval. The numbers of the relief requests that are no longer applicable were not used.

3.1 Relief Request Number 7

For engineering safeguards Class 2 check valves CK-ES-3239/3240, safety injection refueling water tank discharge valves, relief from valve exercising requirements is requested.

3.1.1 Licensee's Basis for Relief

The licensee states:

> Relief is requested in accordance with 10 CFR 50.55a(f)(5)(iii) on the basis that compliance with the code requirements is impractical. Full flow exercising these valves with flow is not possible during any plant condition, other than during a full core offload when fuel pool cooling loads are low, for the following reasons:
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> 1. The original plant design did not include flow paths which will pass the flow required to achieve a full-stroke test.
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> 2. It is not prudent to disassemble these valves at times other than at a full core offload when fuel pool cooling loads are low and shutdown cooling can be secured, because appropriate isolation does not exist between these valves and the shutdown cooling system.

3.1.2 Proposed Alternative Testing

The licensee proposes:

1. These check valves will be part-stroke tested on a quarterly basis. If the scheduled test occurs during power operation, part-stroke testing will be accomplished by Test Procedure QO-16, "Inservice Test Procedure Containment Spray Pumps." If the scheduled test occurs during cold shutdown, part-stroke testing will be accomplished by Test Procedure QO-10, "Containment Spray Check Valve Test." Additionally, part-stroking of these valves is accomplished during the performance of Test Procedures QO-19 and QO-20.

2. These check valves are disassembled and inspected (including a manual full-stroke exercise) in accordance with Surveillance Procedure RT-122, "Inservice Test Program - Check Valve Disassembly and Inspection Program." This method is not in full compliance with the frequency requirements of Generic Letter 89-04 for the reasons stated in the basis above. Disassembly shall occur nominally once per ten years when there is a full core offload and when fuel pool cooling loads are acceptable. Inspection and acceptance criteria will comply with the Generic Letter.

3.1.3 Evaluation

The check valves in the discharge lines from the refueling water tank (1) open to supply suction to the safety injection pumps and the containment spray pumps, and (2) close to prevent back flow of containment sump water into the tank when operating the safety injection system in the recirculation mode during post-accident conditions. As noted in the April 1995 NRC SE, the valves were indicated as Category C; however, they were the subject of NRC Information Notice 91-56, "Potential Radioactive Leakage to Tank Vented to Atmosphere," and may be subject to leakage testing (reference NRC SE dated January 9, 1995, on this issue). As recommended in the April 1995 NRC SE, the licensee has added a leakage rate monitoring test for these valves, though they continue to be listed as Category C in the valve table. If the valves have a leak-tight function, they should be Category A/C for IST. The licensee should determine if the valves should be listed as Category A/C and revise the valve table accordingly within 1 year from the date of this SE. *(Action Item 3.1.a)*

Regarding the schedule for disassembly and inspection to verify the opening and closing capability of these valves, the extension to inspect nominally once per each 10-year period during times when the core is offloaded is consistent with the discussion of extreme hardship in GL 89-04, Position 2, for extending the interval of disassembly and inspection. The function of the valves may continue during refueling outages when shutdown cooling is operating. Therefore, the only plant condition that affords an opportunity to disassemble and inspect these valves is when the core is offloaded, negating

the need for operating shutdown cooling for a period of time. Both valves must be disassembled and inspected when the plant is in the appropriate condition (i.e., core offloaded), even if the condition occurs more often than once every 10 years.

While part-stroke exercising quarterly provides some level of assurance of the opening (and potentially the closing) capability of the valves, it is not adequate for the long-term continued assurance that disassembly and inspection provides. However, if the licensee determines through performance trends that the disassembly and inspection interval is not adequate (i.e., too long) to assure the operational readiness of the valves, the interval should be reexamined. If a core offload is not feasible to accommodate the appropriate interval, some other means of assuring operational readiness may be considered (e.g., nonintrusive techniques, regular preventative maintenance). Current available techniques of nonintrusive testing devices do not lend themselves to the configuration of these valves, though newly developed methods may be available in the future that would provide the necessary information on the condition of the valves. Imposing the requirements of OM-10 for disassembly and inspection of these check valves (i.e., once every refueling outage) would necessitate a full core offload each refueling outage which, without further justification, is an unusual difficulty and a hardship. Unless performance data indicate that quarterly partial testing and disassembly and inspection once in a 10 year period are inadequate to monitor the condition of these valves, the current alternative testing will give a level of assurance of the operational readiness of the valves in compensation of the hardship.

3.1.4 Conclusion

The alternative testing, which includes disassembly and inspection of the subject valves when the core is offloaded, is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) based on the hardship or unusual difficulty without a compensating increase in the level of quality and safety that would result from compliance with the Code. Within 1 year from the date of this SE, the licensee must incorporate a performance review into the testing procedure so that adjustments in the inspection (or testing) frequency can be made as needed. *(Action Item 3.1.b)*

3.2 Relief Request 10

For power-operated Class 3 service water valves CV-0884/0885, service water supply to the emergency diesel generators (EDG), relief from the stroke timing requirements of OM-10 is requested.

3.2.1 Licensee's Basis for Relief

The licensee states:

> Relief is requested in accordance with 10 CFR 50.55a(f)(5)(iii) on the basis that compliance with the code requirements is impractical. Plant configuration will not allow stroke timing of these valves. The control circuitry for CV-0884 and CV-0885 does

to install this equipment would introduce new equipment subject to failure, thus reducing the reliability of the diesel generator cooling system.

3.2.2 Proposed Alternative Testing

The licensee proposes:

> These valves shall be demonstrated as operable once per month in conjunction with diesel generator tests MO-7A-1 and MO-7A-2. This test removes the air supply from CV-0884 and CV-0885 actuators allowing them to travel to the open position (fail safe position). Thus, testing in accordance with MO-7A-1 and MO-7A-2 qualifies as an acceptable "Fail Safe Test." CV-0884 and CV-0885 do not have a position indicating system. Valve position can be determined by cooling system flow rate.
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> Once per 5 years, CV-0884 and CV-0885 actuators are inspected for proper operation in accordance with Predetermined Periodic Activity Control Sheet SWS044. Any actuator degradation, such as diaphragm, packing, or solenoid air leaks, will be discovered and repaired during this activity.

3.2.3 Evaluation

The code requirement for stroke-time testing of power-operated valves is intended to monitor for degrading conditions through increases in the stroke time that could indicate changes in the valve internals or valve actuator and control system. Stroke timing of these valves is impractical because of design limitations. Imposing the code requirements would be burdensome to the licensee, requiring modifications to the system to enable testing. Demonstrating monthly that cooling water is supplied to the EDGs verifies that these valves adequately stroke to the position to fulfill their safety function. The lack of cooling water delivered to the diesels would indicate a problem with these valves and corrective actions could be taken. Additionally, the testing occurs frequently enough that a problem would be identified in a reasonable period of time. Preventative maintenance once every 5 years will additionally monitor the valves for degrading conditions that might not be obvious through testing.

3.2.4 Conclusion

Relief is granted for the test methods used in monitoring the power-operated valves supplying service water to the EDGs. The relief is granted pursuant to 10 CFR 50.55a(f)(6)(i) based on the impracticality of performing testing in accordance with the code requirements. The burden of imposing the code requirements on the licensee has been considered and the proposed alternative testing has been determined to provide adequate assurance of the operational readiness of the valves.

3.3 Relief Request 12

For Class 3 power-operated valves CV-0944/977B, which isolate component cooling water from the radioactive waste evaporators upon a safety injection signal, relief from the stroke timing requirements is requested.

3.3.1 Licensee's Basis for Relief

The licensee states:

> In accordance with 10 CFR 50.55a(f)(5)(iii), relief is requested from the stroke timing requirements of OM-10, paragraph 4.2.1.4 since compliance with the code requirements is impractical.
>
> CV-0944 and CV-0977B are normally open valves which close on an SIS [safety injection signal]. These valves can only be actuated via an SIS, since there is no means of manually positioning these valves. There is no position indication in the control room which is the location from where the SIS activation test is initiated. The SIS is tested once each quarter during performance of Technical Specification (TS) Surveillance Procedure QO-1, "Safety Injection System [SIS]." Stroke time coordination of these valves would impose a hardship during QO-1 for the following reasons:
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> 1. QO-1 is manpower intensive and involves blocking or bypassing several automatic actuations and must, therefore, be performed in as little time as possible because it places the plant in an abnormal operating condition.
>
> 2. The SIS signal is initiated from the control room; however, position indication for CV-0944 and CV-0977B is located at remote panel C-105. Coordination between control room activities and C-105 would be difficult since a dedicated operator would need to be positioned at C-105 with a stop watch. Starting the stopwatch would be manual based (sic) on a verbal signal from the control room, resulting in an additional reaction time error over and above that introduced by the control room operator. As a result, obtaining a consistent stroke time basis suitable for meaningful trending would be near impossible. The information obtained would be of limited use, due to the anticipated wide range of scatter of the data.
>
> The portion of the component cooling water [CCW] system isolated by these two valves is a closed loop. Therefore, it would require failure of both of these valves to close in order to maintain cooling water flow to the radioactive waste evaporators. Such an occurrence would constitute a multiple active failure which is not required to be considered in the plant's safety analysis.

3.3.2 Alternative Testing

The licensee proposes:

> CV-0944 and CV-0977B will be stroke tested each quarter during performance of QO-1. QO-1 will verify that CV-0944 and CV-0977B have traveled to their safety position without measuring stroke time. QO-1 will also verify the fail-safe capability of CV-0944 and CV-0977B on a quarterly basis.

3.3.3 Evaluation

These valves are 10-inch, air-operated (i.e., air opens and the valves fail in the safe — closed — position on removal of air supply), butterfly valves which receive an engineered safeguards signal to close to isolate non-essential cooling loads, including the radioactive waste evaporators. Position indication is available at a remote panel, but control of the valves is not available at the same panel. The SIS is initiated from the control room. The design arrangement is not conducive to measuring stroke time due to the difficulty in communicating the initiation of the SIS to the individual monitoring the position indicating lights at the remote panel. Therefore, measuring stroke time using conventional methods presents a hardship or unusual difficulty without a compensating increase in the level of quality and safety. The code requirement for stroke-time testing of power-operated valves is intended to monitor for degrading conditions by monitoring for increases in the stroke time that could indicate changes in the valve internals or valve actuator and control system. Imposing the code requirements would necessitate modifications, such as installation of position indication or complete valve replacement, to enable testing. The quarterly stroke testing, with verification that the valves travel to their safety-related position and that the valves will fail safe, verifies that these valves are capable of fulfilling their safety function. The testing will indicate a problem with these valves and corrective actions can then be taken.

In the April 1995 SE, the NRC recommended that the licensee consider placing these valves in a preventative maintenance program to monitor for degradation mechanisms and include information in the updated IST program that describes such plans. No such information was described in the updated program.

3.3.4 Conclusion

Based on the hardship or unusual difficulty in performing stroke-time testing in accordance with the code and considering that imposition of the code requirements would not provide a compensating increase in the level of quality and safety, the alternative testing is authorized pursuant to 10 CFR 50.55a(a)(3)(ii). The inclusion in a preventative maintenance program for monitoring degrading conditions should be discussed in a response by the licensee within 1 year from the date of this SE. *(Action Item 3.3)*

3.4 Relief Request 18

Relief from the requirements for power-operated valve stroke timing is requested for category B, Class 3, auxiliary feedwater flow control valves. These valves regulate flow to the steam generators when actuated by the auxiliary feedwater actuation signal. In the event of a main steam line break (or similar event), these valves are manually closed to isolate a depressurized steam generator.

3.4.1 Licensee's Basis for Relief

The licensee states:

> Relief is requested in accordance with 10 CFR 50.55a(f)(5)(iii) on the basis that compliance with the code requirements is impractical. System configuration will not allow stroke time testing in accordance with the code. Valves' actuation and position indicating functions are performed by flow regulators instead of control switches and indicating lights.

3.4.2 Alternative Testing

The licensee proposes:

> Each valve will be exercised to the position required to pass accident required flow rates (without recording stroke times) during the performance of TS Surveillance Procedure QO-21, "Auxiliary Feedwater System Valves, Inservice Test Procedure." Isolation capability will be verified during the performance of QO-21 by exercising each valve to the closed position (without recording stroke times) and verifying the valve shut by recording flow rates equal to 0 [zero] gpm [gallons per minute].
>
> Valve degradation including actuation and position indicating system degradation has been detected by failure to meet acceptance criteria of QO-21. Degradation is indicated by flow controller setpoint drift or change.

3.4.3 Evaluation

Paragraph 1.2, "Exclusions," of OM-10, excludes valves that have no specific function in shutting down a reactor or in mitigating the consequences of an accident and are used only for operating convenience (such as regulating valves). Even though the subject valves are flow regulating valves, they have a fail-safe function to open and an isolation function as well. Therefore, the requirements for valve position indication verification and power-operated valve exercising apply.

The design of these valves does not enable testing because the actuation and position indication are performed by flow regulators rather than control switches and indicating lights. Therefore, compliance with the code requirements is impractical and an alternative method of monitoring these

valves is necessary. If the code requirements were imposed, a burden on the licensee would ensue, necessitating modifications to the actuation and position indication features of the valves. The alternatives proposed by the licensee, in consideration of the impracticality of meeting the code requirements, will provide adequate assurance of the operational readiness of the subject valves. It is assumed that the alternative testing frequency is in accordance with the code requirements since the relief request did not address the test frequency.

3.4.4 Conclusion

Relief from the power-operated valves testing requirements, specifically involving the measurement of stroke times, is granted for the subject valves. The relief is granted pursuant to 10 CFR 50.55a(f)(6)(i) based on the impracticality of performing testing in accordance with the code requirements. Consideration has been given to the burden on the licensee that would result if such requirements were imposed.

3.5 Relief Request 20

Relief from the requirements for valve position indication verification, stroke time testing, and stroke time acceptance criteria is requested for the category B, Class 3, CCW surge tank three-way vent to the CCW room or vent gas collection header valve.

3.5.1 Licensee's Basis for Relief

The licensee states:

> Relief is requested in accordance with 10 CFR 50.55a(f)(5)(iii) on the basis that compliance with the code requirements is impractical. CV-0915 is normally vented from the CCW surge tank to the vent gas collection header. In the case of a leak between one of the CCW cooling loads and the CCW system resulting in radioactive contamination of the CCW system, this valve moves to vent gas to the CCW room. This action avoids uncontrolled radioactive release to the outside environment. These actions are initiated by a high radiation signal from RIA-0915. There are no hand switches associated with the control circuitry. Therefore, it is not possible to accurately time valve strokes. The proposed alternative will test the valve in a mode in which it would be called upon to mitigate an accident.

3.5.2 Alternative Testing

The licensee proposes:

> CV-0915 will be stroke tested once each quarter, through the performance of the Health Physics Procedure HP 6.8, "Process Monitor Operational Check - Quarterly," without stroke timing the valves. Verification of valve motion will be performed at the lights in the main control room.

A limiting value of stroke time will be established at 10 seconds. If CV-0915 fails to operate within this time constraint, then corrective action will be taken. If CV-0915 does not move to the desired position, then it will be declared inoperable.

3.5.3 Evaluation

Paragraph 1.2, "Exclusions," of OM-10, excludes valves that have no specific function in shutting down a reactor or in mitigating the consequences of an accident and are used only for operating convenience (such as manual vent valves). Even though the subject valve is a vent valve, it has a safety function to open automatically on a high radiation signal from radiation detector RIA-0915. Therefore, the requirements for valve position indication verification and power-operated valve exercising apply.

The design of the valve does not enable testing because the actuation signal cannot be controlled by a manual handswitch to reposition the valve. Therefore, compliance with the code requirements is impractical and an alternative method of monitoring these valves is necessary. If the code requirements were imposed, a burden on the licensee would ensue, necessitating modifications to the actuation and control circuitry of the valve. The alternatives proposed by the licensee, in consideration of the impracticality of meeting the code requirements, will provide adequate assurance of the operational readiness of the subject valve.

3.5.4 Conclusion

Relief from the power-operated valve testing requirements, specifically involving the measurement of stroke times, is granted for the subject valve. The relief is granted pursuant to 10 CFR 50.55a(f)(6)(i) based on the impracticality of performing testing in accordance with the code requirements and in consideration of the burden on the licensee that would result if such requirements were imposed.

3.6 Relief Request 21

Relief from the stroke-time testing and acceptance criteria is requested for category B, Class 3, service water valves CV-0821, -0822, -0823, and -0826. These valves control cooling water flow to the CCW heat exchangers. Valves CV-0823 and CV-0826 open and valves CV-0821 and CV-0822 close on safety injection/refueling water tank low level associated with a recirculation actuation signal.

3.6.1 Licensee's Basis for Relief

The licensee states:

> Relief is requested in accordance with 10 CFR 50.55a(f)(5)(iii) from the stroke time measurement and test frequency requirements for the above valves on the basis that compliance with the code requirement is impractical. The function of these valves, as provided above, is to vary service water flow through the

component cooling water heat exchangers and thus regulate CCW temperature by throttling on the discharge flow. The position of the valves at any particular time is set based on the temperature of the water source (Lake Michigan). Repositioning valves CV-0823 and CV-0826 to the full closed position or CV-0821 and CV-0822 to the full open position in order to accomplish a full-stroke test would result in significant changes to the temperature of cooling water supplied to components served by the CCW heat exchangers, particularly during times of high heat loads when the primary coolant pumps are operating. In addition, such rapid fluctuations in cooling flow during times of high heat loads would result in undesirable thermal stresses in the CCW heat exchangers.

It has been determined that by cycling these valves from the "as-found" (throttled position) to their safety position during cold shutdown will acceptably minimize the adverse affects of cycling cooling water flow. Because stroke testing will be initiated from the throttled position, it is not practical to full-stroke the valves, [and] achievement of meaningful stroke time data is not possible. The stroke time will be measured to verify that it falls within the 45-second limiting stroke time requirement. The valve is tested in the mode in which it would be called upon to mitigate an accident.

3.6.2 Alternative Testing

The licensee proposes:

These valves will be partial stroke tested on a cold shutdown basis in accordance with QO-6. The stroke time will be compared against the 45-second limiting stroke time for the purpose of determining operability. Since it will not be possible to measure full-stroke time, the requirements of OM-10, 4.2.1.8, will not be observed. Stroke time acceptance will be as provided below. Performance of QO-6 will satisfy the fail safe actuator test requirements of the code. This procedure will also be used to verify proper operation of the remote position indicators at least once every two years in accordance with Section 4.1.

Verification of stroking within the limiting value of 45 seconds during QO-6 constitutes an acceptable test.

3.6.3 Evaluation

Paragraph 1.2, "Exclusions," of OM-10, excludes valves that have no specific function in shutting down a reactor or in mitigating the consequences of an accident and are used only for system control (such as pressure regulating valves). Even though the subject valves are temperature regulating valves, they have a safety function to open (CV-0823 and CV-0826) and an isolation function (CV-0821 and CV-0822). Therefore, the requirements for valve position indication verification and power-operated valve exercising apply.

While the design of these valves does enable testing, the cooling water transient that could occur during such testing is a hardship and unusual difficulty. Therefore, if an alternative method of monitoring these valves is available, there would be no compensating increase in the level of quality and safety in imposing the code requirements, possibly necessitating modifications to the actuation controls of the valves or placing the plant in an unsafe condition solely to perform testing. The proposed alternative to stroke timing these valves and taking corrective action if the stroke time increases to above 45 seconds will provide adequate assurance of the operational readiness of the subject valves.

3.6.4 Conclusion

The proposed alternative to the power-operated valve testing requirements of OM-10, specifically involving the measurement of stroke times and corrective actions, is authorized for the subject valves. The approval is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) based on the hardship or unusual difficulty of performing the testing in accordance with the code without a compensating increase in the level of quality and safety.

3.7 Relief Request 23

Relief from the test frequency requirements for categories A and B valves exercising every quarter and leakage testing (category A only) every 2 years is requested for all valves in the IST program. However, because all valves in the IST program are not category A and B valves, the request should more properly state the applicability as "All Category A and B Valves." Alternatively, the licensee intended the request to apply to all valves, but failed to state the requirements for Category C valves. The request should be revised. *(Action Item 3.7)*

3.7.1 Licensee's Basis for Relief

The licensee states:

> Technical Specification 4.0.2 established the conditions under which the specified time interval for Surveillance Requirements may be extended (see "Alternative Testing" below). Item a permits an allowable extension of the normal surveillance interval to facilitate surveillance scheduling and consideration of plant operating conditions that may not be suitable for conducting the surveillance, e.g., transient conditions or other ongoing surveillance or maintenance activities. Item b limits the use of the provisions of item a to ensure that it is not used repeatedly to extend the surveillance interval beyond that specified. The limits of Technical Specification 4.0.2 are based on engineering judgement and the recognition that the most probable result of any particular surveillance being performed is the verification of conformance with surveillance requirements. These provisions are sufficient to ensure that the reliability ensured through

surveillance activities is not significantly degraded beyond that obtained from the specified surveillance interval.

3.7.2 Alternative Testing

The licensee proposes:

Unless otherwise specified, each surveillance requirement shall be performed within the specified time interval with:

a. A maximum allowable extension not to exceed 25% of the surveillance interval, and

b. A total maximum allowable combined interval time for any three consecutive surveillance intervals not to exceed 3.25 times the specified surveillance interval.

3.7.3 Evaluation

In accordance with the requirements of OM-10, paragraph 4.2.1.1 and 4.2.2.3(a), all Category A and B valves are required to be exercised to their safety position quarterly, and Category A valves leakage rate tested every two years. OM-10 allows valves to be exercised during cold shutdowns and refueling outages in certain instances. OM-10, however, does not provide for extensions of the surveillance intervals. The licensee proposes to implement the provisions of TS 4.0.2, which permits the extension of surveillance intervals. Plant TS 4.0.5, which requires Class 1, 2, and 3 pumps and valves to be tested in accordance with the ASME Code and Section 50.55a, explicitly states that the provisions of TS 4.0.2 are applicable to the required frequencies for performing IST activities. Additionally, failure to perform a surveillance requirement within the allowed surveillance interval, defined by TS 4.0.2, shall constitute non-compliance with the operability requirements for a Limiting Condition of Operation (TS 4.0.3).

In Section 6.0 of NUREG-1482, the TS allowed extension is noted. According to the basis for the TS 4.0.2 provisions, the 25 percent extension is not intended to be used repeatedly merely as an operational convenience to extend surveillance intervals, but rather allows for scheduling at conditions other than during plant conditions that may not be suitable for conducting the surveillance (e.g., transient conditions or other ongoing surveillance or maintenance activities).

Extending these intervals as allowed by the TS will not compromise the integrity of the systems or components and provides an acceptable level of quality and safety. If the plant is in a transient condition, or other components or systems are undergoing surveillance or maintenance activities, an extension may prevent a required shutdown due to a limiting condition of operation and decrease plant risk from multiple plant activities.

3.7.4 Conclusion

The proposed alternative to the requirements of OM-10 (i.e., to allow the use of TS 4.0.2 extensions of intervals for IST) is authorized pursuant to 10 CFR 50.55a(a)(3)(i) based on the acceptable level of quality and safety afforded by the alternative. Note that for those plant TS (usually TS 4.0.5 or TS 4.0.2) that state that the extension provisions specifically apply to IST activities, further authorization by the NRC is not necessary to apply the provisions.

3.8 Relief Request 28

An alternative to the requirements of Part 1 of the OM Standards (as referenced in OM-10 for testing safety relief devices) is requested for listed relief valves that provide thermal overpressure protection.

3.8.1 Licensee's Basis for Relief

The licensee states:

> Relief is requested in accordance with 10 CFR 50.55a(a)(3) from testing the relief valves listed on the basis that the alternative proposed will provide an acceptable level of quality and safety. The relief valves listed are relief valves that are installed for the purpose of protecting certain components in Class 1, 2, and 3 systems during the time the components are isolated for maintenance purposes. Because these valves do not provide overpressure protection during operation, testing the valves is not required to ensure the plant can be safely shutdown or to mitigate the consequences of an accident. Any damage to the protected components that may result from thermal overpressurization would be identified prior to returning the components to service. If any damage should occur, plant procedures would require an engineering evaluation to ensure the operability of the component prior to returning it to service.

3.8.2 Alternative Testing

The licensee proposes no alternative testing.

3.8.3 Evaluation

The requirements of OM-10 include testing of devices that provide overpressure protection to components which function to shutdown the reactor, maintain a safe shutdown condition, or mitigate the consequences of an accident. For those pressure relief devices that provide thermal overpressure protection for such components, the testing requirements must be met. Therefore, because the licensee has provided no alternative plan for ensuring the setpoint of these devices is maintained at least once every 5 or 10 years (depending on the code class of the system or component protected), the proposal is unacceptable. The ASME Operations and Maintenance Committee is currently reviewing a proposed code case that would apply to these type of pressure relief devices.

The proposed code case would eliminate all of the requirements for additional valve testing upon failure to meet acceptance criteria and the requirements for testing a minimum percentage of valves in a group during a specified period of time. The remaining requirement would be to test the setpoint once every 5 years (Class 1) or once every 10 years (Class 2 and 3) and adjust, repair, or replace as necessary if the setpoint is outside the acceptable range. The licensee may consider revising the request once the ASME O&M code case is approved by the committee. The licensee may also consider actions discussed in Section 4.3.1, "Scope," of NUREG-1482 to determine if the valves are necessarily required for overpressure protection.

3.8.4 Conclusion

The alternative request is denied. NRC approval of the request would be inconsistent with activities currently under consideration within the ASME O&M Committee. These type of valves were first included in the code in the 1986 Edition of Section XI. Both the NRC and the ASME O&M Committee are working to determine appropriate testing requirements for "thermal relief devices" that protect components from overpressure only when the components are isolated. The code case currently under review will address many licensee concerns regarding setpoint testing these valves. In addition, according to the guidance in Section 4.3.1 of NUREG-1482, a licensee may review original code requirements (Section III for construction) and determine or reanalyze the need for these valves, potentially removing them from the scope of the IST program. *(Action Item 3.8)*

3.9 Relief Request 29

Relief from the stroke timing and acceptance criteria requirements for main steam atmospheric dump valves is requested. These valves (1) open to provide a means of removing decay heat from the primary system in order to cool down following a steam generator tube rupture, and (2) close following cooldown to isolate a steam generator with a ruptured tube to preclude release of radioactive material.

3.9.1 Licensee's Basis for Relief

The licensee states:

> Relief is requested in accordance with 10 CFR 50.55a(f)(5)(iii) on the basis that stroke timing the atmospheric steam dump valves is impractical. These valves were not originally designed to be a safety-related method of decay heat removal and, therefore, were not equipped with a control system that is suitable for performing stroke time testing in accordance with OM-10. These valves have position indicating lights in the closed position only; therefore, stroke time testing in [to] the open position is not practical. Subsequent to the original plant design, it was determined that these valves play an important role in the removal of PCS [primary coolant system] decay heat following a steam generator tube

rupture accident. There is no specific requirement for stroking time in either the open or closed position.

3.9.2 Alternative Testing

The licensee proposes:

> These valves will be full-stroke exercised in both the open and closed direction each cold shutdown. Stroke time will not be measured. The valves will be observed locally during stroke testing to ensure the valves stroke promptly and do not exhibit any abnormal or erratic behavior.

3.9.3 Evaluation

The licensee's basis for relief appears to indicate that these valves are not in the scope of the IST program, but are tested as valves that have important, though not required, functions as related to the safe shutdown of the plant in the event of a steam generator tube rupture. If the licensee, subsequent to the original design of the plant, has reanalyzed and upgraded the atmospheric dump system to meet safety-related requirements, the commitments as to the application of 10 CFR 50.55a should be discussed in a revised relief request. Otherwise, it appears that the testing of these components represents augmented implementation beyond the requirements of 10 CFR 50.55a; therefore, NRC approval of alternatives related to testing of these valves would not be necessary.

3.9.4 Conclusion

The licensee should continue testing in the manner discussed in the "Alternative Testing" section above and as stated in the proposed request. Within 1 year from the date of this SE, the licensee should determine whether these valves are within the required scope of the IST program. If the valves are within the scope, the licensee should determine what commitments were made related to inservice testing when the system and valves were upgraded and revise the request to discuss the status of the valves. *(Action Item 3.9)*

3.10 Relief Request 30

Relief from setpoint verification every 24 months, based on a single valve in the "group" of valves, for Class 1 shutdown cooling system relief valve RV-0401 is requested.

3.10.1 Licensee's Basis for Relief

The licensee states:

> Relief is requested in accordance with 10 CFR 50.55a(f)(5)(iii) from the requirements to perform setpoint verification on a 24-month basis because such testing is impractical. RV-0401 is located in the letdown from the primary coolant system to the

shutdown cooling system. Testing cannot be performed with the PCS greater than cold shutdown because RV-0401 provides the second isolation barrier for the PCS. Failure of the first isolation barrier (MO-3015) would result in uncontrollable and highly contaminated PCS leakage into the engineered safeguards room.

Testing cannot be performed during cold shutdown with shutdown cooling in service because Palisades has no alternate letdown paths for shutdown cooling. Based on this fact, RV-0401 can only be tested during periods when shutdown cooling can be isolated. An example of this would be during full core offloads.

3.10.2 Alternative Testing

The licensee proposes:

> CPCo will verify RV-0401 setpoints during full core offloads when testing has not been performed in the previous 24 months as required by Technical Specification Surveillance Procedure RT-116, "Miscellaneous Safety Systems Safety Valve Setpoint Testing."

3.10.3 Evaluation

Valve RV-0401 is a 3/4"-1" relief valve on a 12-inch line.

The licensee gives one example of a plant mode that allows setpoint testing of this valve (i.e., during core offloads), indicating that there may be other plant conditions that would allow testing. Additionally, no maximum time limit for the testing is given (e.g., at least once every 5 years, or once every 10 years during the reactor vessel exam). Without information on the history of the valve and a stated maximum time limit, the acceptability of the proposed alternative for long-term approval cannot be ascertained. Interim approval for the first 24 months of the interval is authorized based on the hardship that would ensue if the code requirements were imposed. Because the testing for Class 1 relief valves is generally based on all valves in a group being tested within a 5-year period, the approval for an initial 24-month period does not preclude the licensee meeting this general requirement. If the code requirements were imposed, the valve setpoint testing would be required approximately three times in a 5-year period. Potentially requiring a plant core offload solely to perform valve setpoint testing would not offer a compensating increase in the level of quality and safety for the interim period. However, if the plant is placed in a condition that would allow setpoint testing of this valve before the expiration of the interim approval period, setpoint testing must be performed.

Before the end of the 24-month interim period, the licensee must review historical data for this valve or similar valves (i.e., in the plant, even in Class 2 or 3 systems; or data from the Nuclear Plant Reliability Data System) to assess the expected performance. In addition, the licensee must establish a maximum interval for setpoint testing based on the performance history of the type of valve, possible opportunities to conduct the testing, and other

factors that contribute to the hardship of setpoint testing (e.g., is the valve welded in the line?).

3.10.4 Conclusion

The alternative testing is authorized for the first 24 months of the 10-year interval which began August 21, 1995, pursuant to 10 CFR 50.55a(a)(3)(ii) based on the hardship or unusual difficulty without a compensating increase in the level of quality and safety that would result if the requirements to perform setpoint testing during that 24-month period were imposed (e.g., full core offload solely to test the valve). However, if the plant is placed in a condition that allows testing during that 24-month period, the requirements of the code must be met (i.e., the setpoint must be verified). The licensee must take further action regarding this alternative prior to the expiration of the interim period. *(Action Item 3.10)*

3.11 Relief Request 31

Relief from the requirements of Part 1 of the OM Standards for setpoint testing of relief devices is requested for shutdown cooling system Class 2 category C valves RV-3162 and RV-3164, specifically the requirement that all valves of each type be tested within each 10-year period, with a minimum of 20 percent of the valves tested within any 48 months. RV-3162 functions to provide overpressure protection to the shutdown cooling discharge header from small amounts of backleakage from the primary coolant system. RV-3164 functions to provide overpressure protection for the shutdown cooling supply line during plant heatup. Failure of RV-3164 to provide overpressure protection in this line could cause the line to be inoperable during plant cooldown.

3.11.1 Licensee's Basis for Relief

The licensee states:

> Relief is requested in accordance with the provisions of 10 CFR 50.55a(f)(5)(iii) on the basis that compliance with the code requirements is impractical. The Palisades configuration uses one system for shutdown cooling service and low pressure safety injection. Relief is requested from the requirement to perform setpoint verification on a 48-month basis because such testing is impractical. RV-3162 and RV-3164 are located in the discharge and supply lines for the shutdown cooling system.
>
> Testing cannot be performed with the reactor critical because removal of these valves from service would render more low pressure safety injection system components inoperable than allowed by plant technical specifications. Testing cannot be performed during cold shutdown with shutdown cooling in service because these valves are located in non-redundant portions of the shutdown cooling system. Palisades has no alternate discharge paths for shutdown cooling. Based on this fact, RV-3162 and

RV-3164 can only be tested during periods when shutdown cooling can be isolated. An example of this would be during full core offloads.

Testing during the period between cold shutdown and reactor critical is impractical. Testing requires the draining of a safety system and the removal of relief valves for setpoint testing. During this time period, it may be necessary to return to an operating mode requiring the safety system which has been made unavailable in order to accomplish setpoint testing.

3.11.2 Alternative Testing

The licensee proposes:

CPCo will verify RB-3162 and RV-3164 setpoints during full core offloads when testing has not been performed in the previous 48 months as required by Technical Specification Surveillance Procedure RT-116, "Miscellaneous Safety Systems Safety Valve Setpoint Testing."

3.11.3 Evaluation

Relief Request 31 is similar to Relief Request 30. Valve RV-3164 is a 1.5-inch/2.5-inch valve protecting a 14-inch pipe. RV-3162 is a 2-inch valve protecting a 12-inch pipe.

The licensee gives one example of a plant mode that allows setpoint testing of these valves (i.e., during core offloads), indicating that there may be other plant conditions that would allow testing. Additionally, no maximum time limit for the testing is given (e.g., at least once every ten years during the reactor vessel exam). Without information on the history of the valves and a stated maximum time limit, the acceptability of the proposed alternative for long-term approval cannot be ascertained. Interim approval for the first 24 months of the interval is approved based on the hardship that would ensue if the code requirements were imposed. Because the testing for Class 2 relief valves is generally based on all valves in a group being tested within a 10-year period, the approval for an initial 24-month period does not preclude the licensee meeting this general requirement. If the code requirements were imposed, the valve setpoint testing would be required approximately three times in a 10-year period. Potentially requiring a plant core offload solely to perform valve setpoint testing would not offer a compensating increase in the level of quality and safety for the interim period. However, if the plant is placed in a condition that would allow setpoint testing of these valves before the expiration of the interim approval period, setpoint testing must be performed.

Before the end of the 24-month interim period, the licensee must review historical data for these valves or similar valves (i.e., in the plant, even in Class 1 or 3 systems; or data from the Nuclear Plant Reliability Data System) to assess the expected performance. In addition, the licensee must establish a maximum interval for setpoint testing based on the performance

history of the type of valves, possible opportunities to conduct the testing, and other factors that contribute to the hardship of setpoint testing (e.g., are the valves welded in the line?).

3.11.4 Conclusion

The alternative testing is authorized for the first 24 months of the 10-year interval which began August 21, 1995, pursuant to 10 CFR 50.55a(a)(3)(ii) based on the hardship or unusual difficulty without a compensating increase in the level of quality and safety that would result if the requirements to perform setpoint testing during that 24-month period were imposed (e.g., full core offload solely to test the valves). However, if the plant is placed in a condition that allows testing during that 24-month period, the requirements of the code must be met (i.e., the setpoint must be verified) if a similar opportunity is not expected within the next 24 months (i.e., the first 48-month period). The licensee must take further action regarding this alternative prior to the expiration of the interim period. *(Action Item 3.11)*

4.0 EVALUATION OF PUMP RELIEF REQUESTS

The relief request numbers were carried over from the second 10-year interval. The numbers of the relief requests that are no longer applicable were not used. Note that the licensee has elected to use root-mean-square (RMS) values rather than peak-to-peak values for vibration measurement. The values given in OM-6, which are given in peak-to-peak measurements, have to be converted to accurately represent limits for RMS. While there is not an absolute correlation, the O&M Committee has stated, in response to an inquiry, that either RMS or peak-to-peak values may be used if properly converted. Many instruments have either selection and will convert the data internally; therefore, the use of RMS with external conversion is acceptable. Approval to use RMS was given in NRC's SE dated October 12, 1995.

4.1 Relief Request 4

Relief from the vibration measurement acceptance criteria of OM-6, Table 3a, is requested for the containment spray pumps (P-54 A/B/C) and the low pressure safety injection pumps (P-67A/B). This relief request was reviewed and approved in an NRC SE dated October 12, 1995.

4.2 Relief Request 7

Relief Request 7 concerns the skid-mounted EDGs' diesel jacket water pumps which provide cooling water from the Class 3 service water system.

4.2.1 Licensee's Basis for Relief

The licensee states:

> Relief is requested from the requirements of OMa-1988, Part 6, Table 3a, parameters while testing the [diesel jacket water pumps]. These pumps are mounted on the diesel generator's skid.

These pumps only have discharge pressure and system temperature instrumentation installed. It is our interpretation that the NRC doesn't require skid mounted components to be tested per Subsection IWP. This is supported by the "Minutes of the Public Meeting on Generic Letter 89-04" published 10/25/89 by the NRC. Question 110 is applicable.

[The] response [to Question 110] was reaffirmed in NUREG-1482 for Inservice Testing at Nuclear Power Plants, Draft Report for Comment. The position stated in NUREG-1482, in part, is as follows: "Until the scope of components for 10 CFR, Section 50.55a, is expanded to include all safety-related pumps and valves, and until the OM codes and standards specifically address skid-mounted components, the staff has determined that the testing of the major components is an acceptable means for verifying the operational readiness of the skid-mounted and component subassemblies."

4.2.2 Alternative Testing

The licensee proposes:

The diesel jacket water cooling pumps operability will be determined by the performance of the monthly diesel surveillances, Technical Specification Surveillance Procedures MO-7A-1, "Emergency Diesel Generator 1-1 (K-6A)," and MO-7A-2, "Emergency Diesel Generator 1-2 (K-6B)." During these surveillances, the jacket water temperature and pressure will be measured and compared to acceptance criteria to determine system operability. This is sufficient to determine the operability of the jacket water cooling system.

4.2.3 Evaluation

These subcomponents were not designed to enable IST (i.e., IST is impractical) and are considered part of the diesel assembly rather than separate major components. It would be a burden on the licensee to redesign the system to enable IST of the individual pumps (i.e., flowrate and pressure measurement devices would have to be installed in the lines). The NRC indicated in NUREG-1482, Section 3.4, that the testing of a major component is an acceptable means of monitoring the operational readiness of skid-mounted components if the licensee documents this approach in the IST program. The relief request is adequate documentation for using this recommendation; however, the relief request references the draft of NUREG-1482. The licensee should review final NUREG-1482 and revise the relief request accordingly. *(Action Item 4.2)* As discussed in Section 3.4 of NUREG-1482, the diesel auxiliary support systems are specifically excluded from Regulatory Guide 1.26 which gives guidance on classifying components as Quality Group A, B, or C. Though the licensee classifies these pumps as Class 3 (service water is the contained fluid), the monthly diesel testing performed in accordance with the plant technical specifications, with monitoring of the jacket water

temperature and pressure, indicates whether or not the pumps are performing their function. Therefore, the alternative testing provides an adequate means of assessing the operational readiness of these skid-mounted pumps.

4.2.4 Conclusion

The relief request is granted pursuant to 10 CFR 50.55a(f)(6)(i) based on the impracticality of performing IST on the individual components, in consideration of the burden that would ensue if the code requirements were imposed, and the adequacy of alternative testing for assessing the operational readiness of the pumps.

4.3 Relief Request 8

Relief from the frequency response range of vibration measuring transducers and their readout system requirements is requested for the Class 2 charging pumps P-55 A/B/C.

4.3.1 Licensee's Basis for Relief

The licensee states:

> Relief is requested on the basis that imposition of the OMa-1988 requirements for vibration frequency response range would not provide a compensating increase in nuclear safety. Obtaining vibration data in the correct frequency range is impractical using existing test equipment. The following information is applicable for the Palisades charging pumps: [NOTE: "rpm" is revolutions per minute.]
>
> | Pump ID | Motor Speed | Pump Crankshaft Speed |
> |---|---|---|
> | P-55A | 1786 rpm | 115.5 rpm |
> | P-55B | 1790 rpm | 203.2 rpm |
> | P-55C | 1790 rpm | 203.2 rpm |
>
> A vibration monitoring system for pump P-55A would require the low end of the frequency response range to be 0.64 Hz [Hertz]. For pumps P-55B and P-55C, the lower limit would be 1.13 Hz. The calibrated frequency response range of the vibration monitoring system employed at Palisades is 10 Hz to 1000 Hz. Vibration accuracy meets the Code required $\pm$ 5% over this entire range. This frequency response range is acceptable for rotational speeds of 1786 rpm and above.
>
> A review of maintenance history did not reveal any instances of failure of charging pump crankshafts, connecting rods, or plungers. Failure or degradation of these components would be indicated in the lower frequency vibration ranges. Interviews with systems engineering and maintenance personnel confirm the lack of these types of failures.

4.3.2 Alternative Testing

The licensee proposes:

> For the charging pumps, Palisades shall perform vibration monitoring of the pumps, unit gear housings, and motors. Pump readings in units of IPS-RMS [inches per second-root mean square] shall be evaluated during the performance of testing to determine unit operability. Vibration signatures for the pumps, gear housings, and motors shall be reviewed on a quarterly basis. This review is intended to discover degradation of bearings, gears, and other components where degradation is indicated by vibration changes at frequencies greater than 10 Hz.
>
> Additionally, Palisades will perform periodic charging pump inspections in accordance with the Periodic Maintenance Program. These inspections are designed to discover degradation of pump, gear box, and accumulator components. The charging pumps are located in an accessible area of the plant auxiliary building. Operator rounds are performed on a shift basis. Operators would note any unusual noises associated with degradation of low frequency charging pump components.

4.3.3 Evaluation

The licensee has not discussed the specific type of bearings in the charging pumps and whether the type of bearings are susceptible to degradation and failures due to conditions that would be indicated at very low frequencies of vibration. Subharmonic frequencies may also be indicative of rotor rub, seal rub, loose seals, and coupling damage. The lack of previous failures that might be identified in the low frequency response range is not conclusive. The Code committees changed the requirements for the frequency response ranges so that more noise contributors (precursors to failure) would be indicated. The licensee bases the request on the impracticality of the testing using existing instrumentation; however, it has not discussed the possibility of procuring new vibration instrumentation. The NRC has indicated previously that the need for new instrumentation to implement revised requirements in the Code does not, alone, represent a backfit, and, therefore, alone does not represent an impracticality under the provisions of 10 CFR 50.55a (e.g., design limitations of the pump rather than of the portable instrumentation). Vibration instruments with a frequency response as low as 2 Hertz are commercially available, though this level would still not allow the licensee to meet the Code requirements of 0.64 to 1.13 Hertz for the charging pumps. While the unavailability of instrumentation is not, alone, adequate justification for relief, it may be one element of the licensee's basis for relief; however, the availability of the instrumentation is not discussed in the licensee's request.

The application of a preventative maintenance program on the pumps can be an element of an acceptable alternative to the IST requirements of the Code; however, no schedule is given for the periodic inspections or the acceptance criteria for the inspections and no inspections or maintenance on the

crankshafts are mentioned. Additionally, no criteria for operator rounds are described. The licensee does not discuss any lubrication analysis program which might also give an indication of bearing wear that would not be identified if the lower frequencies are not monitored.

Immediate imposition of the Code requirements would be a hardship or an unusual difficulty in that the licensee would have to procure instrumentation without adequate time to evaluate all options fully and determine the best overall approach, or risk declaring the pump inoperable when it is fully capable of performing its safety function. The current monitoring of the pumps, with added emphasis on the criteria for operator rounds of the normally operating pumps, will provide adequate assurance of the operational readiness for an interim period of six months from the date of this SE. The interim period will allow the licensee time to evaluate available instrumentation that more closely complies with the Code requirements, preventative maintenance activities, pump design, and other monitoring (e.g., operator rounds), with the application of appropriate acceptance criteria.

4.3.4 Conclusion

The alternative is authorized for an interim period of six months from the date of this SE pursuant to the provisions of 10 CFR 50.55a(a)(3)(ii) based on the hardship or unusual difficulty without a compensating increase in the level of quality and safety that would ensue if the requirements were immediately imposed. In the interim period, the licensee must assess further the appropriate monitoring for these pumps and revise the relief request to more fully describe the basis for not meeting the frequency response range in the code and the proposed alternative. If instrumentation is procured that conforms with the code requirements, the request will no longer be necessary and may be allowed to expire. *(Action Item 4.3)*

4.4 Relief Request 9

The licensee describes the use of RMS measurement values for pump IST vibration monitoring rather than peak-to-peak values as specified in OM-6, paragraph 5.2(d). As noted in Section 4.0 above, the acceptability of the use of RMS was approved in NRC's SE dated October 12, 1995, as applicable to all pumps in the IST program generally. Relief Request 9 is intended to document the background and implementation of the vibration program using RMS. No further NRC review is necessary.

5.0 COLD SHUTDOWN JUSTIFICATIONS AND REFUELING OUTAGE JUSTIFICATIONS

OM-10 includes provisions for licensees to defer testing to cold shutdowns or refueling outages when testing at certain plant conditions is impractical. The comments below should be reviewed by the licensee and, where appropriate, changes made to the justifications as documented in the IST program. *(Action Item 5.0)*

Cold Shutdown Justifications (CS):

General: Where the verification of position indication is discussed as "once each refueling outage," it should also be noted that the verification is required "at least once every two years."

CS-2 For valves CV-2083/2099, the leakage rate test procedure referenced in CS-2 (RO-3236) is not consistent with the one listed on the valve table (RO-3244).

CS-3 It is not clear that the testing conforms to GL 89-04, Position 1, for the full flow rate. A value of 2513 gpm is given as an acceptable full-flow test, but CS-3 also states that testing has been performed at 300 gpm and 1000 gpm. Which value represents a full-flow test, and is the testing performed at this value?

CS-4 For valve CV-2009, relief requests RR-11 and RR-12 are referenced in CS-4. RR-11 does not appear in the program and RR-12 does not apply to this valve. Neither are listed in the valve test table.

CS-10 Valves CV-3027/3056 are listed in the valve table as having both an open and a closed safety function. CS-10 discusses only the reverse-flow closure function and states that the stroke time is monitored from the open to the closed position. Is the stroke time monitored in both directions during the testing at cold shutdown conditions? If not, is the open stroke time monitored quarterly? Paragraph 4.2.1.2 requires that a valve be exercised to the position(s) required to fulfill its safety function(s).

CS-11 For valves CK-ES-3201/3192, is the exercise test for closure (performed per QO-8B) conducted quarterly as stated in the valve table or during cold shutdown conditions as stated in CS-11? The exercise test for opening (performed per QO-8B) is stated as being performed during cold shutdown.

CS-13 The valve table does not list CS-13 for valves CV-3031/3057. The valve table indicates that these valves have a safety position of both open and closed. CS-13 states that the performance of these valves shall be determined from a stroke-time test from the open to the closed position. If the valves have a safety function in the open position, they should also be stroke time tested from the closed position to the open position. Paragraph 4.2.1.2 requires that a valve be exercised to the position(s) required to fulfill its safety function(s).

CS-14 The valve table indicates that valves CV-3029/3030 have a safety position of both open and closed. CS-14 states that the performance of these valves shall be determined from a stroke-time test from the closed to the open position. If the valves have a safety function in the closed position, they should also be stroke-time tested from the open position to the closed position. Paragraph 4.2.1.2 requires that a valve be exercised to the position(s) required to fulfill its safety function(s).

CS-17 For valves CV-0910/0911/0940 and CK-CC-0910, RO-32 is listed as the leakage rate test procedure in CS-17. The valve table lists RO-3214.

CS-20 The valve table indicates that valves CV-0824/0847 have a safety position of both open and closed. CS-20 states that the performance of these valves shall be determined from a stroke-time test from the open to the closed position. If the valves have a safety function in the open position, they should also be stroke-time tested from the closed position to the open position. Paragraph 4.2.1.2 requires that a valve be exercised to the position(s) required to fulfill its safety function(s). The Code does not make exceptions to these requirements for valves electrically locked in one position which have a safety function in both directions. Also note that the valve table lists CS-20 for valve CV-0824, but the columns are offset.

CS-22 PORVs PRV-1042B/1043B have a safety function in both the open and closed positions listed in the valve table. CS-22 is unclear as to whether stroke timing of these valves is performed in both directions. The "Alternative Testing" section states that the valves will be exercised to the open position each cold shutdown. The "Verification Method" section indicates that the stroke time values in the open and closed direction will be trended.

CS-24 PORV block valves PRV-1042A/1043A have a safety function in both the open and closed positions listed in the valve table. CS-24 is unclear as to whether stroke timing of these valves is performed in both directions. The "Alternative Testing" section states that the valves will be exercised to the open position each cold shutdown. The "Verification Method" section indicates that the stroke time values in the open and closed direction will be trended.

CS-30 For the ECCS motor-operated valves that reposition when transferring suction from the safety injection/refueling water tank to the primary coolant system (for shutdown cooling), the alternative testing discusses only the exercise to the open position. However, the valve table shows these valves as having a safety function in both the open and closed position. If the valves have a safety function to close, they should also be stroke-time tested from the open position to the closed position. Paragraph 4.2.1.2 requires that a valve be exercised to the position(s) required to fulfill its safety function(s). The Code does not make exceptions to these requirements for valves electrically locked in one position which have a safety function in both directions.

CS-34 For volume control tank T-54 discharge check valve CK-CVC2088, the valve table lists the valve as normally open with a safety position of "N/A." It is also listed as a passive valve, but tested closed during cold shutdowns. The corrective action stated in CS-34 discusses failure to meet "stroke time or closure rate requirements." Generally, the exercising of check valves does not include measuring the time or the rate of valve closure.

Refueling Outage Justifications (ROJ):

General:

- In several ROJs, it is unclear whether closure verification is being performed during the refueling outage test, whereas in others it is clear.

- In several ROJs, the licensee discusses hardships. However, the criteria for test deferral should be related to impracticalities in the design of the component, subsystem, or system. The results will generally be the same, but the basis would be somewhat different. For example, ROJ-10 states that "[p]rocessing of [30,000 gallons of radioactive] waste would constitute an unusual hardship." To state this in terms of the design of the system would be as follows (for example):

  > The design of the system does not enable IST of the check valves at the required flow rate because of the dilution that results from testing; therefore, performing IST at conditions other than refueling is impractical.

ROJ-6 is written as a request for an alternative; however, it appears to be a refueling outage justification. If it is a relief request, it should not be included in the ROJs, but should be given a number and identified specifically as a relief request. If it is an ROJ, then the first sentence of the basis should be changed.

ROJ-7 includes wording similar to ROJ-6.

ROJ-9 is applicable for a single valve, CK-CA400. The "Alternative Testing" section refers to "these check valves" as if there are multiple valves. The text should be corrected.

6.0 CONCLUSION

The staff concludes that the relief requests as evaluated and modified by this SE will provide reasonable assurance of the operational readiness of the pumps and valves to perform their safety-related functions. The staff has determined that granting of the relief requests and approval of proposed alternatives to the code requirements pursuant to 10 CFR 50.55a is authorized by law and will not endanger life or property, or the common defense and security and is otherwise in the public interest. In making this determination, the staff has considered the impracticality of meeting the Code requirements and the burden on the licensee if the requirements were imposed. Where the request has been denied in Section 3.8, the licensee should meet the requirements of the code at the first test of the applicable components performed more than 30 days from the date of this SE. For those action items identified in the SE, the licensee should take appropriate actions and respond to the NRC describing the actions taken within 1 year from the date of this SE. For the interim approvals given in Sections 3.10, 3.11, and 4.3, the licensee should resolve the long-term testing prior to the expiration of the interim periods authorized.

Principal Contributor: P. Campbell, NRR/DE/EMEB
Date: August 30, 1996