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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE INSERVICE TESTING PROGRAM REQUESTS FOR RELIEF

INDIANA MICHIGAN POWER COMPANY

DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-315 AND 50-316

1.0 INTRODUCTION

The Code of Federal Regulations, 10 CFR 50.55a, requires that inservice testing (IST) of certain ASME Code Class 1, 2, and 3 pumps and valves be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable addenda, except where alternatives have been authorized or relief has been requested by the licensee and 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," provides alternatives to the ASME Code requirements determined acceptable to the staff without further NRC review. Implementation of the GL 89-04 positions is subject to inspection.

Section 55a of 10 CFR Part 50 authorizes the Commission to approve alternatives and to grant relief from ASME Code requirements upon making the necessary findings. The NRC staff's findings with respect to authorizing alternatives and granting or not granting the relief requested as part of the licensee's IST program are contained in this safety evaluation (SE).

Furthermore, in rulemaking amendments to 10 CFR 50.55a effective September 8, 1992, (57 FR 34666), the 1989 edition of ASME Section XI was incorporated in 10 CFR 50.55a(b). The 1989 edition provides that the rules for IST of pumps and valves shall meet the requirements set forth in ASME Operations and Maintenance Standards Part 6 (OM-6), "Inservice Testing of Pumps in Light-Water Reactor Power Plants," and Part 10 (OM-10), "Inservice Testing of Valves in Light-Water Reactor Power Plants." Pursuant to 10 CFR 50.55a(f)(4)(iv), portions of editions or addenda may be used provided that all related requirements of the respective editions or addenda are met, and subject to Commission approval. Because the alternatives meet later editions of the ASME Code, relief is not required for those inservice tests that are conducted in accordance with OM-6 and OM-10, or portions thereof, provided all related requirements are met. Whether all related requirements are met is subject to NRC inspection.

By letter dated June 28, 1993, the Indiana Michigan Power Company (the licensee) provided revision 4 to the D. C. Cook Nuclear Power Plant, Units 1 and 2, IST program, including a number of new and revised relief requests. The submittal incorporated the results of recently conducted program reviews and responded to an action item for relief requests 1-5113-46 and 2-5113-41, which were granted on an interim basis in an NRC SE dated February 19, 1993. Additional information was provided in the licensee's letter of January 7, 1994, based on discussions with the staff on November 23, 1993, regarding the use of nonintrusive testing techniques for check valves.

2.0 EVALUATION OF RELIEF REQUESTS

This SE covers the following relief requests described in the licensee's letters dated June 28, 1993, and January 7, 1994: (by drawing numbers) 1-5113-46 and 2-5113-41, Note 1; 1-5129-31 and 2-5129-32, Notes 10 and 12; 1-5135-35 and 2-5135-34, Note 6; 1-5142-32 and 2-5142-35, Notes 5, 6, and 7; and 1-5151B/D-28 and 2-5151B/D-27, Note 6. The current IST program for the second 10-year interval for D. C. Cook Nuclear Plant, Units 1 and 2, began July 1, 1986, and ends June 30, 1996. The second 10-year interval IST program is based on requirements of the 1983 Edition, including addenda through the summer 1983 Addenda, of the ASME Boiler and Pressure Vessel Code, Section XI (the Code).

28.1 Relief Requests 1-5113-46 and 2-5113-41, Note 1

The relief requests, one per unit, concern reverse flow closure verification of check valves ESW-111, -112, -113, -114, -141, -142, -143, and -144, which prevent reverse flow into the header of the opposite emergency service water 8(ESW) train. The licensee requested relief from the requirements of IWV-3520 for quarterly exercising to the closed position for these valves.

2.1.1 Basis For Relief

The licensee stated in the June 28, 1993, submittal:

> These check valves open to provide cooling water flow to various emergency diesel generator loads. In addition, these valves close to prevent back flow into the opposite ESW train header. The open safety function will be tested in accordance with IWV-3520. The closed safety function cannot be tested in accordance with IWV-3520 for the following reasons: There are no external position indicators associated with the valves, and no instrumentation or taps available at the valve to determine positive closure. In order to determine valve closure, an entire ESW header and safety train, including both emergency diesel generators, must be removed from service. These valves cannot be tested at cold shutdown frequency since, with fuel loaded, the ESW is at its highest load demand (RHR [residual heat removal] operating) at this time and cannot be removed from service. Temporary Code relief has been granted (SE transmitted under letter dated February 19, 1993 from L. B. Marsh to E. E. Fitzpatrick) to allow evaluation of non-intrusive examination (NIE) methods for these valves. Permanent relief is requested at this time on the basis that

these valves are 'duo disc' (two center shafted crescent-shaped disc halves) check valves, and NIE is not expected to yield meaningful results.

Further information regarding the use of nonintrusive techniques for verifying closure was provided in the licensee's letter dated January 7, 1994, as follows:

> These valves are wafer style duo-disc check valves. Consequently, the body is very narrow and transducer placement is difficult. Recently, with NIE [nonintrusive examination] vendor assistance, some success with ultrasonics has been realized, but this is not considered adequate acceptance criteria for IST. 'Radiography, as previously discussed, is not a desirable alternative. Interim relief of the form discussed in the June 28, 1993, submittal for these valves is requested through the end of the second ten-year inspection interval. This will allow time to gain experience with NIE, apply systematic evaluation for NIE across all IST check valves, and develop acceptance criteria and procedures. It should also be noted that these valves are disassembled and inspected at each refueling outage as the result of IE Bulletin 83-03, "Check Valve Failures in Raw Water Cooling Systems of Diesel Generators."

2.1.2 Alternate Test

The licensee proposes to verify the closed safety function of these valves by disassembly and inspection during each refueling outage.

2.1.3 Evaluation

Exercising these valves and verifying that they close is not practical because of the lack of instrumentation or external position indicators. Additionally, these valves must remain in service during normal operation and cold shutdown to maintain emergency diesel generator (EDG) operability. Taking the valves out of service renders the cooling water to the diesel unavailable, and therefore, removes the support function for diesel operability.

Check valve back flow testing that is acceptable to the staff is described in GL 89-04, Attachment 1, Position 3, "Back Flow Testing of Check Valves," which states: "Verification that a Category C valve is in the closed position can be done by visual observation, by an electric signal initiated by a position-indicating device, by observation of appropriate pressure indication in the system, by leak testing or by other positive means." The minutes on public meetings related to GL 89-04 indicated that disassembly and inspection for verifying the closed position of check valves is considered an acceptable option when no other means is available. However, the staff has since incorporated the 1989 Edition of Section XI which references OM-10 as the rules for inservice testing of valves as noted in Section 1.0 above. Paragraph 4.3.2.4, "Valve Obturator Movement," of OM-10, lists the acceptable methods of verifying the movement of a check valve disc. Paragraph 4.3.2.4(c) states that "as an alternative...disassembly every refueling outage to verify operability of check valves may be used." While the NRC has allowed a

disassembly and inspection sampling program in Position 2 of GL 89-04 (similar valves grouped and disassembled and inspected on a rotating basis), performing disassembly and inspection for each valve every refueling outage meets that portion of the requirements of OM-10 which addresses verifying valve obturator movement.

Nevertheless, the NRC encourages consideration of the use of nonintrusive methods for verifying valve obturator movement, which also meets the requirements of both IWV-3520 of Section XI and paragraph 4.3.2.4 of OM-10. In the response to the temporary relief granted in the NRC's SE dated February 19, 1993, requesting evaluation of the application of nonintrusive examination methods for these valves, the licensee stated that the duo-disc design of these valves (two center shafted semi-circular disc halves) does not lend itself to the use of nonintrusive examination. Typical duo-disc swing check valves are provided with two spring-loaded D-shaped discs mounted on a rib across the valve bore. The design reduces the length of the path along which the center of gravity of the disc travels and also reduces the weight of such a disc by about 50% compared with single disc swing check valves of the same size. With the spring loading and the reduced weight, the response of the valve to retarding flow is therefore very fast. Nonintrusive techniques may not exhibit meaningful, trendable results; however, the licensee has indicated that it will be working with vendors to assess whether the technology has developed to the point that application to these valves is a possibility.

Because the valves are disassembled and inspected every refueling outage, the licensee meets the requirements of OM-10 which address verifying obturator movement, although other, related portions of OM-10 may not be met. In view of the fact that this specific portion of OM-10 has been met, approval of the alternative would ensure an acceptable level of quality and safety for the remainder of the interval until June 1996. At that time the licensee will have experience with the use of nonintrusive techniques and will have an assessment of the application of such techniques for verifying the operation of these valves. If such techniques prove to provide meaningful results, the licensee may consider reassessing the need to disassemble and inspect the valves each outage for IE Bulletin 83-03; however, commitments made in response to the bulletin may require approval of the NRC to effect change.

2.1.4 Conclusion

Because (1) the NRC has indicated that disassembly and inspection may be used to verify the closing capability of check valves when no other positive means is available, (2) the licensee has investigated, and will continue to assess the use of, nonintrusive techniques for verifying obturator movement, (3) the valves are currently disassembled and inspected every refueling outage, meeting an alternative stipulated in paragraph 4.3.2.4(c) of OM-10, and (4) the design does not permit monitoring by external means such as indication of flow (or no flow) or disc position, the alternative method for verifying the closing capability of these valves is authorized pursuant to 10 CFR 50.55a(a)(3)(i) as providing an acceptable level of quality and safety.

2.2 RELIEF REQUESTS 1-5129-31 AND 2-5129-32, NOTE 10

The relief requests, one per unit, concern stroke testing of check valves SI-185 (one per unit). The licensee requested relief from the requirements of IWV-3520 for quarterly exercising to verify the opening and closing capability of the valves.

2.2.1 Basis For Relief

The licensee stated in its June 28, 1993, letter:

> This normally closed valve has an open safety function during transfer of charging pump suction from the VCT [volume control tank] to the RWST [refueling water storage tank] and a closed safety function during recirculation by preventing containment sump water from entering the RWST (redundant with IMO-910, -911 which are closed by operator action during evolution of the suction transfer EOP [emergency operating procedure]). The open function of this valve cannot be tested during: (1) power operation without introducing a high concentration of boric acid in the RCS [reactor coolant system] or (2) cold shutdown because the only full flow path available is into the reactor coolant system and the system does not have sufficient volume to accommodate that flow without a possible low temperature overpressure condition. The active closed safety function (open to admit RWST water then closed during recirculation) cannot be tested without opening the valve.

2.2.2 Alternate Test

The licensee proposes that the valve will be full-stroke exercised, with open and closed positions verified, during refueling outages. Passive testing (disc will remain in its normally closed position) will be performed quarterly to further assess the ability of the valve to fulfill its closed safety function.

2.2.3 Evaluation

In final rulemaking effective September 8, 1992, published in the Federal Register, August 6, 1992 (57 FR 34666), the staff approved the 1989 Edition of ASME Section XI which references OMa-1988 Part 10 as alternative rules for IST of valves. Paragraph (f)(4)(iv) of Section 50.55a provides that inservice tests of valves may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in 10 CFR 50.55a(b), subject to the limitations and modifications listed, and subject to Commission approval. Portions of editions or addenda may be used provided that all related requirements of the respective editions or addenda are met. The related requirements in this case are paragraph 4.3.2 of OM-10, which allows full-stroke exercising that is not practicable during power operation or cold shutdown to be deferred to refueling outages, and paragraph 6.2(d) of OM-10, which requires that the justification for deferral of check valve exercising

be documented in the inservice test plan. The licensee's proposed alternative is in accordance with paragraph 4.3.2 of OM-10. The inclusion of the note in the IST program meets the documentation requirements of paragraph 6.2(d).

2.2.4 Conclusion

Based on the finding that the proposed alternative meets OM-10, paragraphs 4.3.2 and 6.2(d), the related portion of the later Code requirements that the staff find acceptable, the alternative testing is approved pursuant to 10 CFR 50.55a(f)(4)(iv) provided that all related requirements are met. Implementation of related requirements is subject to NRC inspection.

2.3 Relief Requests 1-5129-31 and 2-5129-32, Note 12

The licensee requested relief from the exercising requirements of IWV-3520 for valve CS-295 for both units.

2.3.1 Basis For Relief

The licensee stated in its June 28, 1993, letter:

> This normally open check valve is located in the Volume Control Tank (VCT) discharge to charging pump suction header and is downstream of the Reactor Coolant Pump (RCP) seal water return branch connection. Under certain conditions, this valve performs a safety related function during the recirculation phase of a LOCA [loss of coolant accident] by closing to prevent leakage of significant amounts of containment sump water back through the seal water heat exchanger circuit, ultimately preventing a leakage path outside of containment. Exercising the valve closed during normal plant operation would require securing the charging pumps which would interrupt charging/letdown flows as well as RCP seal injection. Loss of charging could result in loss of pressurizer level followed by a reactor trip. Testing this valve would require termination of seal injection flow. Seal injection flow is maintained continuously to cool and lubricate the RCP seals, and to prevent contaminants from the RCS [reactor coolant system] from coming into contact with (and potentially damaging) the RCP seals and pump bearing. This valve has been disassembled and inspected under the SOER 86-03 Check Valve PM [Preventive Maintenance] Program with no degradation found.

The licensee provided additional information in its letter of January 7, 1994, as follows:

> This valve cannot be tested during cold shutdowns with RCPs secured since seal injection is provided at all times when the RCS is full. The conservative operating philosophy of maintaining seal injection when the RCS is full prevents contaminants from entering the seal cavity, and minimizes the possibility of seal or pump bearing damage.

2.3.2 Alternate Test

The licensee proposes that this valve will be exercised in accordance with IWV-3522(a), but on a refueling outage frequency, and the closed position verified by radiography or other NIE means. If NIE does not yield conclusive results, the valve will be disassembled and inspected on a refueling outage frequency.

2.3.3 Evaluation

In final rulemaking effective September 8, 1992 (57 FR 34666), the staff approved the 1989 Edition of ASME Section XI which references OMa-1988 Part 10 as alternative rules for IST of valves. Paragraph (f)(4)(iv) of Section 50.55a provides that inservice tests of valve may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in 10 CFR 50.55a(b), subject to the limitations and modifications listed, and subject to Commission approval. Portions of editions or addenda may be used provided that all related requirements of the respective editions or addenda are met. The related requirements in this case are paragraph 4.3.2 of OM-10, which allows full-stroke exercising that is not practicable during power operation or cold shutdown to be deferred to refueling outages, and paragraph 6.2(d) of OM-10, which requires that the justification for deferral of check valve exercising be documented in the inservice test plan. The licensee's proposed alternative is in accordance with paragraph 4.3.2 of OM-10. The inclusion of the note in the IST program meets the documentation requirements of paragraph 6.2(d).

2.3.4 Conclusion

Based on the finding that the proposed alternative meets OM-10, paragraphs 4.3.2 and 6.2(d), the related portion of the later Code requirements that the staff find acceptable, the alternative testing is approved pursuant to 10 CFR 50.55a(f)(4)(iv). Implementation of related requirements is subject to NRC inspection.

2.4 Relief Requests 1-5135-35 and 2-5135-34, Note 6

The licensee requested relief from the exercising requirements of IWV-3520 for component cooling water (CCW) check valves CCW-224-1, -2, -3, -4, CCW-225-1, -2, -3, and -4, for both units.

2.4.1 Basis For Relief

The licensee stated in its June 28, 1993, letter:

> These 2-inch check valves are upstream of the Reactor Coolant Pump (RCP) thermal barrier heat exchanger. These valves cannot be tested during RCP operation without securing CCW flow to the thermal barrier heat exchanger, which could cause RCP failure. There is no adequate instrumentation upstream/downstream of these check valves, or method to establish reverse flow, for closure testing. These valves are Y-pattern 'clamp seal' type piston check valves, and, due to their

irregular geometry do not appear as good candidates for non-intrusive examination (NIE). These valves are currently included in the SOER 86-03 Check Valve PM Program.

The licensee provided additional information in its letter of January 7, 1994, as follows:

> Two of these valves are in series in each RCP component cooling water loop, and are not isolable from each other. Sufficient experience with NIE has not yet been developed to predict the effect and extent of interaction between these valves when attempting to apply NIE for individual component acceptance. Radiography...is not a desirable alternative [due to ALARA, source scheduling and management, exclusion of other work in the area, and technical difficulties associated with radiographing relatively large, thick-walled components in water-filled systems]. Interim relief of the form discussed in the June 28, 1993, submittal for these valves is requested through the end of the second ten-year inspection interval. This will allow time to gain experience with NIE, apply systematic evaluation for NIE across all IST check valves, and develop acceptance criteria and procedures.

2.4.2 Alternate Test

The licensee proposes that these valves will be disassembled, manually full-stroke exercised, and visually examined on a sampling basis (two of the eight) at refueling frequency such that all valves will be examined no less frequently than once every fourth refueling outage (i.e., once every 6 years). Disassembly and inspection on a sampling basis is consistent with GL 89-04 Attachment 1 Position 2.

2.4.3 Evaluation

Position 2 of GL 89-04 states that "[t]he NRC staff position is that valve disassembly and inspection can be used as a positive means of determining that a valve's disk will full-stroke exercise open or of verifying closure capability, as permitted by IWV-3522." It further states that "[w]here the licensee determines that it is burdensome to disassemble and inspect all applicable valves each refueling outage, a sample disassembly and inspection plan for groups of identical valves in similar applications may be employed," and provides guidance for grouping of valves such that each valve is disassembled and inspected at least once every 6 years, with a minimum of one valve disassembled and inspected each refueling outage.

2.4.4 Conclusion

The licensee's proposal is in accordance with the guidance stated in Position 2 of GL 89-04. As stated in GL 89-04, provided the provisions of the letter are followed, relief is granted to follow the alternative testing delineated in Position 2, pursuant to 10 CFR 50.55a(g)(6)(i) [currently 10 CFR 50.55a(f)(6)(i)]. Therefore, the proposed alternative is acceptable under GL 89-04 and is approved pursuant to 10 CFR 50.55a(f)(6)(i). The licensee has

indicated that it will continue to evaluate the application of nonintrusive techniques for verifying obturator movement and consider the various options for the next 10-year interval.

2.5 Relief Requests 1-5142-32 and 2-5142-35, Note 5

The licensee requested relief from the exercising requirements of IWV-3520 for valves SI-110N and -110S for both units.

2.5.1 Basis For Relief

The licensee stated in its June 28, 1993, letter:

> Safety Injection (SI) pump discharge valves, SI-110N and -110S, cannot be exercised during power operations because the SI pumps cannot overcome reactor coolant system pressure. Therefore, no flow path exists and, because minimum flow lines branch off upstream of these valves, they cannot be part-stroke tested during pump testing. These valves cannot be exercised during cold shutdown because the SI pumps are required to be inoperable by Technical Specification 3.5.3 to protect against low temperature overpressurization of the reactor.

2.5.2 Alternate Test

The licensee proposes that these valves will be full-stroke exercised, with open and closed positions verified, at refueling frequency.

2.5.3 Evaluation

In final rulemaking effective September 8, 1992 (57 FR 34666), the staff approved the 1989 Edition of ASME Section XI which references OMa-1988 Part 10 as alternative rules for IST of valves. Paragraph (f)(4)(iv) of Section 50.55a provides that inservice tests of valve may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in 10 CFR 50.55a(b), subject to the limitations and modifications listed, and subject to Commission approval. Portions of editions or addenda may be used provided that all related requirements of the respective editions or addenda are met. The related requirements in this case are paragraph 4.3.2 of OM-10, which allows full-stroke exercising that is not practicable during power operation or cold shutdown to be deferred to refueling outages, and paragraph 6.2(d) of OM-10, which requires that the justification for deferral of check valve exercising be documented in the inservice test plan. The licensee's proposed alternative is in accordance with paragraph 4.3.2 of OM-10. The inclusion of the note in the IST program meets the documentation requirements of paragraph 6.2(d).

2.5.4 Conclusion

Based on the finding that the proposed alternative meets OM-10, paragraphs 4.3.2 and 6.2(d), the related portion of the later Code requirements that the

staff find acceptable, the alternative testing is approved pursuant to 10 CFR 50.55a(f)(4)(iv). Implementation of related requirements is subject to NRC inspection.

2.6 Relief Requests 1-5142-32 and 2-5142-35, Note 6

Relief was granted in the NRC's SE issued August 29, 1989, to perform valve exercising of the check valves in the supply lines from the boron injection tank to the reactor coolant cold legs during refueling outages. The relief request was revised because the recirculation piping has been abandoned. The revision did not change the basis for granting the relief in the previous SE. Therefore, the previously granted relief remains effective.

2.7 Relief Requests 1-5142-32 and 2-5142-35, Note 7

Relief was granted to allow deferral of full-stroke exercising of SI-101 (for both units), common suction check valve for the SI pumps, to refueling outages in NRC's SE issued August 29, 1989. The relief requests, one per unit, have been revised to discuss verification of the closure capability of the valve.

2.7.1 Basis For Relief

The licensee stated in its June 28, 1993, letter:

> The common (SI pumps) suction check valves cannot be full-stoke exercised at power since the SI pumps cannot overcome reactor coolant system pressure, and full opening of SI-101 cannot be achieved with the SI pumps operating on minimum flow paths. SI-101 is part-stroke exercised at power operation during pump testing and full-stroke exercised at refueling frequency. Closure capability of the valve cannot be determined by flow or differential pressure measurements since instrumentation is not available and establishment of test conditions would isolate both SI pumps from their suction source and enter the unit into T/S 3/4.5.2.

2.7.2 Alternate Test

The licensee proposed the following alternative:

> Consistent with the guidance of GL 89-04, Attachment 1, Position 2, and the response to Question 17 in the GL 89-04 Public Meeting Minutes, closure capability of the valve will be verified by disassembly and inspection. Since disassembly of this valve involves breaching a system containing contaminated water, the valve will be disassembled and inspected at an every third refueling outage.

The licensee provided additional information in its letter of January 7, 1994, as follows:

> Radiography is not a desirable alternative [for verifying closure of this valve]. Based on our limited experience with NIE so far on similar bonnet-hung check valves, these should be good candidates for

NIE. However, we do not expect to have NIE fully qualified and programmatically supported for use in the IST program until the start of the third ten-year inspection interval. Interim relief of the form discussed in the June 28, 1993, submittal for these valves is requested through the end of the second ten-year inspection interval. This will allow time to gain experience with NIE, apply systematic evaluation for NIE across all IST check valves, and develop acceptance criteria and procedures.

2.7.3 Evaluation

Position 2 of GL 89-04 states that "[t]he NRC staff position is that valve disassembly and inspection can be used as a positive means of determining that a valve's disk will full-stroke exercise open or of verifying closure capability, as permitted by IWV-3522." It further states that "[w]here the licensee determines that it is burdensome to disassemble and inspect all applicable valves each refueling outage, a sample disassembly and inspection plan for groups of identical valves in similar applications may be employed," and provides guidance for grouping of valves such that each valve is disassembled and inspected at least once every 6 years, with a minimum of one valve disassembled and inspected each refueling outage. Position 2 further states that extension of the valve disassembly and inspection interval to one valve every other refueling outage should only be considered in cases of extreme hardship where the extension is supported by actual in-plant data from previous testing.

The licensee states that disassembly of this valve involves breaching a system containing contaminated water and proposes to perform disassembly and inspection at every third refueling outage. Based on the information presented in the relief request (Note 7), the extension of the interval has not been justified. While the use of disassembly and inspection for verifying closure is approved per GL 89-04, provided the guidance in Position 2 is followed, the proposed frequency of inspection is not justified. If the licensee has justification to support an extreme hardship (in-plant data from previous testing), deferral to every other refueling outage may be acceptable in accordance with Position 2, but the supporting documentation must be available in the IST program records for inspection. Because the valve disc is "bonnet-hung," there are concerns that the alignment may be out-of-adjustment upon reinstallation following disassembly and inspection. It is recommended that the licensee employ sufficient quality control on the process to ensure that the alignment is verified to be correct when the valve bonnet is reinstalled. A partial-stroke exercise is also stipulated in Position 2, if possible, which will provide an additional measure of assurance that the disc is properly in place to allow flow. Because flow can be achieved even if the disc is misaligned, the flow test does not provide any assurance that the disc will seat properly; therefore, the staff recommends that the licensee continue with its investigation and evaluation of the application of nonintrusive techniques to verify closure of this valve in the next 10-year interval.

2.7.4 Conclusion

The relief previously granted for the opening full-stroke exercise of the valve remains effective. The use of disassembly and inspection, performed in accordance with the guidance in GL 89-04, Position 2, is approved in accordance with GL 89-04; however, the licensee has not justified the extension of the disassembly and inspection interval beyond each refueling outage. Therefore, the disassembly and inspection must be performed each refueling outage unless the licensee submits additional justification demonstrating an extreme hardship for extending the interval to every other refueling outage, in accordance with GL 89-04, Position 2.

2.8 Relief Requests 1-5151B/D-28 and 2-5151B/D-27, Note 6

The licensee has requested relief for the test frequency for the EDG air start check valves.

2.8 Basis For Relief

The licensee states in its June 28, 1993, submittal:

> These valves perform an open safety function to admit air, from alternate receivers, to the EDG 'jet assist valves' (XRV-220 and -225), which provide an air boost to the diesel turbocharger during a fast start sequence. They perform a closed safety function by isolating the redundant air supply piping. These valves have no external position indication, instrumentation, or means of exercising. They can only be exercised during a fast start of the EDG (when jet assist is used). To test these valves to Code requirements, each EDG would require two fast starts (air supplied from alternate receivers) each quarter. Each EDG is subject to a fast start sequence once per 184 days per Technical Specification 4.8.1.1.2. As discussed in this T/S, starting at reduced acceleration rates is recommended by the manufacturer so that mechanical stress and wear on the diesel engine are minimized.

2.8.2 Alternate Test

The licensee proposed the following alternative:

> Proposed testing is to verify one valve open and the alternate closed during a fast start surveillance, and to verify the alternate position on the subsequent fast start (184 days later) through use of the alternate air receiver. In this manner, each valve will be stroked to both positions once per year, and the number of EDG fast starts will not be increased.

2.8.3 Evaluation

The NRC discussed the need for reducing the number of fast starts of EDGs in Section 10, "Electric Power," of NUREG-1366, "Improvements to Technical Specifications Surveillance Requirements," with recommended technical

specification changes delineated in GL 93-05, "Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operation." The licensee's proposal will ensure that the full-stroke capability of the check valves will be verified at least once every 6 months on a rotating basis. Additionally, at least one of the two valves will be tested once each quarter during diesel starts performed on a quarterly basis. This ensures the capability of one of two trains of the air start system to start the diesel which is redundant to another diesel with a two-trains air start system. Because of the defense-in-depth and the dual redundancy, testing the check valves (one or two valves each quarter, with each valve being tested once per 6 months) on the rotating frequency of diesel fast starts provides an acceptable level of quality and safety for the air start system without unduly subjecting the diesel to twice as many fast-start tests. The proposal comports with the discussion in NUREG-1366 for reducing the number of fast starts of the diesels. Additionally, the valves will be tested more frequently than valves which cannot be tested at plant conditions other than refueling outages which is an acceptable frequency allowed by OM-10.

2.8.4 Conclusion

Because (1) the alternate testing will ensure that one of two trains of the air start system will function as required each quarter, (2) each of the valves will be tested every 6 months, and (3) the diesel will not be subjected to twice as many starts simply to test both valves each quarter, the alternative test frequency is authorized pursuant to 10 CFR 50.55a(a)(3)(i) as providing an acceptable level of quality and safety for assuring the operational readiness of the valves to start the diesels.

3.0 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 valves to perform their safety-related functions. The staff has determined that granting relief pursuant to GL 89-04, authorizing alternatives pursuant to 10 CFR 50.55a(a)(3)(i), and approving alternatives pursuant to 10 CFR 50.55a(f)(4)(iv) and 50.55a(f)(6)(i) 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 performing the required testing and the burden on the licensee if the requirements were imposed.

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