



September 21, 2001

C0901-02  
10 CFR 50.55a(a)(3)(i)

Docket Nos. 50-316

U. S Nuclear Regulatory Commission  
Attn: Document Control Desk  
Mail Stop O-P1-17  
Washington, D.C. 20555-001

Donald C. Cook Nuclear Plant Unit 2  
PROPOSED ALTERNATIVE TO THE PROVISIONS OF  
THE ASME OM CODE, PART 1,  
FOR PRESSURE RELIEF DEVICE TESTING

Pursuant to 10 CFR 50.55a(a)(3)(ii), Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Unit 2, proposes an alternative to current scheduling requirements for conducting pressure relief device testing. In accordance with 10 CFR 50.55a(a)(3)(ii), licensees may propose alternatives to the requirements of 10 CFR 50.55a if they demonstrate that compliance with the specified requirements results in a hardship or unusual difficulty without a compensating increase in the level of quality and safety.

As required by 10 CFR 50.55a, testing of certain Class 2 and 3 pressure relief devices is performed in accordance with American Society of Mechanical Engineers (ASME) Operation and Maintenance Standard OM-1987, Part 1, "Requirements for Inservice Performance Testing of Nuclear Power Plant Pressure Relief Devices." Section 1.3.4.1(b) of OM-1987, Part 1 requires that valves of each type and manufacture (i.e., sample group) be tested within a ten year period, with a minimum of 20% of the valves within each sample group tested within any 48 months. I&M proposes a one-time alternative to extend the 48-month test interval to 52 months for 7 of the 32 sample groups existing in Unit 2.

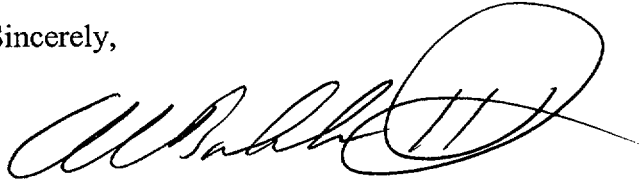
Attachment 1 to this letter provides a detailed description of the proposed alternative and the basis for concluding that compliance with the Code test requirement represents a hardship without a compensating increase in quality and safety. Attachment 2 provides a listing of new commitments made in this letter.

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I&M requests approval of this request by November 6, 2001.

Should you have any questions, please contact Mr. Ronald W. Gaston, Manager of Regulatory Affairs, at (616) 697-5020.

Sincerely,

A handwritten signature in black ink, appearing to read "A. Bakken III". The signature is fluid and cursive, with a large loop at the end.

A. Christopher Bakken III  
Site Vice President

/dmb

Attachment

c: J. E. Dyer  
MDEQ – DW & RPD  
NRC Resident Inspector  
R. Whale

## ATTACHMENT 1 TO C0901-02

### Relief Request SV1

Pursuant to 10 CFR 50.55a(a)(3)(ii), Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Unit 2, proposes an alternative to current scheduling requirements for conducting pressure relief device testing. In accordance with 10 CFR 50.55a(a)(3)(ii), licensees may propose alternatives to the requirements of 10 CFR 50.55a if they demonstrate that compliance with the specified requirements results in a hardship or unusual difficulty without a compensating increase in the level of quality and safety.

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#### **A. ASME Code Requirements**

ASME OM-1987, Part 1, Section 7.3 requires periodic testing of ASME Code Class 2 and 3 pressure relief devices as specified in Paragraph 1.3.4. OM-1987, Part 1 Paragraph 1.3.4.1(b), which applies following the initial ten year service period, requires testing pressure relief devices of each type and manufacture (i.e., sample group) with a minimum of 20% of the valves within each sample group tested within any 48 months.

In accordance with OM-1987, Part 1 Paragraph 7.3.2.2, the required testing consists of:

- (a) visual examination;
- (b) seat tightness determination;
- (c) set pressure determination;
- (d) determination of compliance with the Owner's seat tightness criteria; and
- (e) verification of the integrity of the balancing device on balanced valves.

#### **B. Proposed Alternative**

I&M proposes a one-time alternative consisting of an extension of the 48-month test interval to 52 months for 7 of the 32 Unit 2 sample groups. This would extend the 48 month interval by approximately 8 percent. Since each of the 7 groups consists of either one or two safety valves, the proposed extension affects only 7 valves. The 7 valves affected are identified in Section C

below. The proposed extension will allow testing of the 7 valves as originally scheduled during the next Unit 2 refueling outage. This outage was scheduled to begin in November 2001, but has been rescheduled to begin in January, 2002 due to a forced outage. The test interval immediately following the January, 2002 refueling outage will be 44 months for the 7 safety valve groups. The interval for the 7 valve groups will be 48 months thereafter. Therefore, all safety valves within each sample group will still be tested once during the current ten-year valve in-service test plan interval that began on July 1, 1996.

### C. Components for Which Relief is Requested

Relief is requested for the 7 safety valves identified in the following table. These valves are all ASME Code Class 2 and OM-1987, Part 1 requires that each Class 2 valve be tested every ten years. However, because some groups contain only one valve, the specified frequency is once every 48 months, since a minimum of 20 percent of the valves must also be tested in this time frame. The 48 month interval start date is based on the date when the valve could have potentially been exposed to system fluid, i.e., been exposed to an environment which could induce a failure mechanism such as corrosion or elevated temperature.

Valve No.	Description	No. of Valves in Group	Start of 48 Month Interval	Current Test Due Date
2-SV-54	Reactor Coolant Pump Seal Water Heat Exchanger HE-11 Safety Valve	1	11/11/97	11/12/01
2-SV-56	Chemical and Volume Control System Charging Pumps Suction Header Safety Valve	1	11/11/97	11/12/01
2-SV-96	Safety Injection Pumps Suction Header Safety Valve	1	11/09/97	11/10/01
2-SV-97	Boron Injection Tank TK-11 Outlet Safety Valve	1	11/11/97	11/12/01
2-SV-98S	South Safety Injection Pump PP-26S Discharge Header Safety Valve	2	11/09/97	11/10/01
2-SV-102	Residual Heat Removal to Reactor Coolant Loops #2 & #3 Cold Legs Safety Valve	1	11/09/97	11/10/01
2-SV-104W	West Residual Heat Removal Heat Exchanger HE-17W Outlet Safety Valve	2	11/09/97	11/10/01

**D. Basis for Alternative**

In accordance with 10 CFR 50.55a(a)(3)(ii), licensees may propose alternatives to the requirements of 10 CFR 50.55a if they demonstrate that compliance with the specified requirements results in a hardship or unusual difficulty without a compensating increase in the level of quality and safety. These criteria are addressed below.

**Hardship**

Testing of 2-SV-56, 2-SV-96, 2-SV-98S, 2-SV-102, and 2-SV-104W requires that the core be off-loaded because the discharge piping for these relief valves connects to a common header that serves other Emergency Core Cooling System (ECCS) relief valves. The header discharges to the pressurizer relief tank. For optimum protection of personnel, it is necessary to provide positive isolation of all potential fluid sources for the common header. This would require rendering multiple trains of ECCS's inoperable, including their decay heat removal and boron injection functions. This can only be performed with the reactor defueled.

Testing of 2-SV-54 would require the unit to be shut down, securing all reactor coolant pumps, reducing reactor coolant pressure below 100 psig, and depressurizing and possibly degassing the volume control tank (VCT).

Testing of 2-SV-97 would require the unit to be shut down since it would require depressurizing the volume control tank, and possibly venting or purging the header into which the valve discharges.

As described above, testing any of the above identified 7 valves requires the unit to be shutdown, and testing most of the valves requires the core to be off-loaded. Accordingly, I&M planned to test these valves during the Unit 2 refueling outage that was previously scheduled to begin November 3, 2001. However, equipment problems unrelated to the safety valves resulted in an unanticipated Unit 2 shutdown on August 30, 2001. The forced outage impacted resources needed for planning and preparation of the Unit 2 refueling outage. As a result, I&M has rescheduled the refueling outage to commence on January 19, 2002. Compliance with the current 48 month requirement would impose a hardship since it would require premature commencement of the refueling outage.

Although testing of two of the valves (2-SV-54 and 2-SV-97) does not require the unit to be defueled, I&M considers that testing these two valves during the current forced outage would not be prudent, since the testing would require significant operational evolutions to achieve the necessary plant conditions. These evolutions, such as degassing the VCT, collapsing the pressurizer bubble, depressurizing the plant, and subsequently re-pressurizing the plant and re-establishing the pressurizer bubble, can present challenges to personnel and equipment. I&M considers that such challenges should be minimized. I&M has therefore concluded that it would be imprudent to perform these evolutions on an emergent basis during the current forced outage when they are already planned for performance during the January, 2002, refueling outage.

Additionally, testing requires removal of the valves from the system and I&M considers it prudent to have spare valves on hand prior to removal of the installed valves. However, spare valves have not yet arrived. Finally, the addition of this testing along with the associated evolutions and plant conditions to the current forced outage scope would significantly prolong the outage. Consequently, I&M considers testing of these two valves during the current forced outage would also impose a hardship.

### Level of Quality and Safety

I&M has concluded that, for the 7 valve groups, maintaining the current test interval at 48-months rather than allowing a one-time 52-month interval would not provide a level of quality and safety that compensates for the above described hardships. This conclusion is based on both generic and valve specific considerations.

### Generic Considerations

These safety valves are tested more frequently than other safety valves because of their relatively small sample group sizes (one or two valves per group). As stated above, the frequency specified by OM-1987, Part 1 for testing all Class 2 and 3 valves in a sample group is ten years. OM-1987, Part 1 also requires that 20 percent of the valves within each sample group be tested within any 48 months. The basis for the 20 percent value is to provide for distribution of the valves to be tested over the ten year period. If the sample group contains only one valve, this 20 percent sampling results in a required test frequency of every 48 months. Except for 2-SV-104W, which is part of a 2 valve group, all of the safety valves for which an alternative is requested have been tested within the last 47 months. The CNP safety and relief valve program complies with the requirement in OM-1987, Part 1 Paragraph 1.3.4.1(e)(2) that any valve exceeding its stamped set pressure by 3% or greater shall be repaired or replaced, the cause of failure shall be determined and corrected, and the valve shall successfully pass a retest before it is returned to service.

In addition, Unit 2 was shut down for an extended outage beginning September 9, 1997, and returned to normal operating pressures and temperatures (Mode 3) on June 13, 2000. Because of the extended outage, the affected safety valves were at reduced operating pressures, temperatures, and/or operating conditions, such as vibration, for significant periods. Therefore, the actual time interval when operating conditions may have caused in-service degradation is significantly shorter than the 47 month period since the valves were last tested. The relevance of time spent at normal operating conditions is recognized in Section IWV-3500 of the 1983 Edition of the ASME Code, which defines test frequencies based on refueling outages rather than calendar months.

## Valve Specific Considerations

- 2-SV-54, Reactor Coolant Pump Seal Water Heat Exchanger HE-11 Safety Valve

This valve is located outside containment. The valve is upstream of the seal water heat exchanger and protects the piping and heat exchanger from overpressurization if this section of the system is isolated. The nominal valve set pressure (150 psig) equals the design pressure of the seal water heat exchanger. The relief valve discharges to the volume control tank.

Currently, the allowable set pressure is 146 to 154 psig and no leakage is allowed. When tested in April 1996, the as-found set pressure was determined to be 2 psig below its ideal set point of 150 psig. There was no seat leakage identified. When tested in November of 1997, the as-found set pressure was determined to be 2 psig below its acceptable range. The valve also showed some leakage. The valve was disassembled and the parts were decontaminated, cleaned, and inspected. The disc and nozzle were lapped. The valve was re-assembled and left set at 150 psig.

In summary, the valve set pressure was found to be slightly low the last time it was tested, and the valve showed some leakage. The acceptability of the valve's previous performance, the small amount by which it was outside its allowable band and the corrective measures taken provide a high degree of assurance that the valve will perform within allowed limits through the proposed extension period.

- 2-SV-56, Chemical and Volume Control System Charging Pumps Suction Header Safety Valve

This valve is located outside containment. The valve is located on the suction line to the centrifugal charging pumps, and relieves any excessive pressure that may occur if the suction line isolation valves are closed and the system is over-pressurized. This valve also protects the centrifugal charging pump suction piping from overpressure during the recirculation phase following a loss of coolant accident (LOCA) when the residual heat removal (RHR) pumps' discharge is aligned to the suction of centrifugal charging pumps. The nominal set pressure (220 psig) equals the design pressure of the associated piping/components. The relief valve discharges to the pressurizer relief tank.

Currently, the allowable set pressure is 214 to 226 psig and no leakage is allowed. When tested in October, 1994, the as-found set pressure was determined to be 255 psig. The valve was adjusted to 220 psig and re-installed. There was no seat leakage identified. When tested in April 1996, the as-found set pressure was determined to be 219 psig which is only 1 psig from its previous as-left set point. There was no seat leakage identified. When tested in November, 1997, the as-found set pressure was determined to be 214 psig. The valve failed its second set point test at 211 psig. The valve was adjusted and left set at 220.5 psig. There was no seat leakage identified.

In summary, the valve set pressure was found to be slightly low at its second set point test the last time the valve was tested. The acceptability of the valve's previous performance, the small amount by which it was outside its allowable band and the corrective measures taken provide a high degree of assurance that the valve will perform within allowed limits through the proposed extension period.

- 2-SV-96, Safety Injection Pumps Suction Header Safety Valve

This valve is located outside containment. The valve has a safety function to protect the safety injection and centrifugal charging pump suction piping from overpressure during the recirculation phase following a LOCA when the RHR pumps' discharge is aligned to the suction of centrifugal charging and safety injection pumps. This valve discharges to the pressurizer relief tank.

Currently, the allowable set pressure is 214 to 226 psig and 10 cc/hr leakage is allowed. When tested in April, 1992, the as-found set point was determined to be 248 psig. There was no seat leakage identified. The valve was adjusted and left set at 220 psig. When tested in October, 1997, the valve failed its as-found set pressure test at 208 psig. The valve was adjusted and left set at 224 psig.

In summary, the valve set pressure was found to be set slightly low at its last test, and set high in the test prior to the last test. The small amount by which the valve was outside its allowable band on the last test and the corrective measures taken provide a high degree of assurance that the valve will perform within allowed limits through the proposed extension period.

- 2-SV-97, Boron Injection Tank TK-11 Outlet Safety Valve

This valve is located outside containment. The valve functions to protect the centrifugal charging pump ECCS injection header piping from overpressure. This valve also provides thermal expansion relief for the fluid contained between the boron injection tank inlet and outlet isolation valves.

Currently, the allowable set pressure is 2653 to 2817 psig and 10 cc/hr leakage is allowed. When tested in April, 1992, the as-found set pressure was determined to be within the allowable band. Seat leakage was identified and the valve was disassembled and found to have a small indentation in the seating area. The seat and disc were lapped and gaskets were replaced. The valve was reassembled and left set at 2700 psig. When tested in October, 1997, the as-found set point was determined to be 2785 psig. No seat leakage was identified.

In summary, the valve has been found to remain within its allowable set point range for over 66 months, and has demonstrated no seat leakage following repair of the small indentation in



the seat in 1992. Therefore, there is a high degree of assurance that the valve will perform within allowed limits through the proposed extension period.

- 2-SV-98S, South Safety Injection Pump PP-26S Discharge Header Safety Valve

This valve is located outside containment. The valve functions to protect the safety injection pump discharge piping from overpressure in the event of back leakage through the ECCS injection check valves. The valve discharges to the pressurizer relief tank.

Currently, the allowable set pressure is 1649 to 1751 psig and 10 cc/hr leakage is allowed. When tested in April, 1992, the as-found set pressure was determined to be 1720 psig. This setting is 30 psig below its ideal set point, which was 1750 psig at that time, and well within the allowable range at that time of 1698-1803 psig. Some seat leakage was identified and the disc and nozzle ring received minor lapping. The valve was left set at 1780 psig. When tested in November, 1997, the as found set point was determined to be 1785 psig which was only 5 psig above its as left set point 5 years earlier. No seat leakage was identified. In accordance with a plant design change the allowable set point range was changed to 1649 to 1751 psig and the valve was left set at 1710 psig which is within 10 psig of its new ideal set point of 1700 psig. No leakage was identified.

In summary, the valve was determined to have remained well within its allowable set point range for 66 months when last tested in November, 1997, and demonstrated no seat leakage during that test. Therefore, there is a high degree of assurance that the valve will perform within allowed limits through the proposed extension period.

- 2-SV-102, Residual Heat Removal to Reactor Coolant Loops #2 & #3 Cold Legs Safety Valve

This valve is located inside containment. The valve protects the low pressure RHR normal cooldown piping from overpressure such as may result from back-leakage through check valves located near the reactor coolant system piping. Back-leakage of the check valves is further isolated by a motor operated valve during normal RCS operating conditions. The capacity of this safety valve is several times the expected leakage from the check valves.

Currently, the normal cool down path protected by this valve is not used. Normal operating procedures allow the use of this flow path only for an emergency in which alternate cool down flow paths are unavailable. The alternate cool down flow paths contain two relief valves, 2-SV-104W and 2-SV-104E, that provide redundant over-pressure protection for the piping associated with 2-SV-102. The normal cooldown line is not part of the ECCS injection flowpath. The valve and associated piping is normally isolated from the remainder of the RHR system and is not pressurized by ECCS operation.

Currently, the allowable set pressure is 582 to 618 psig and 10 cc/hr leakage is allowed. When tested in August, 1988, the as-found set point was determined to be 612 psig.

However, the valve would not reseal. The valve was re-assembled with a new disc, pin, bellows, nozzle, and gaskets, and was left set at 610 psig. When tested in August, 1990, the valve failed to lift. The valve was adjusted and left set at 607 psig. No seat leakage was identified. When the valve was tested in September, 1994, the set point was determined to be 650 psig. The valve was adjusted and left set at 600 psig. No seat leakage was identified. When the valve was tested in November, 1997, the as-found set point was determined to be 665 psig. The valve also failed the leakage test. During repairs, force was required to dislodge the disc assembly from the disc guide. The seating surfaces were found to be pitted and worn. The valve was rebuilt and re-tested, and left set at 605 psig.

In summary, each failure has been addressed by corrective maintenance appropriate to the failure mechanism. The corrective maintenance performed on the valve provides assurance that the valve is capable of performing its relief function.

- 2-SV-104W, West Residual Heat Removal Heat Exchanger HE-17W Outlet Safety Valve

This valve is located outside containment. The valve protects the RHR ECCS injection piping from overpressure. This valve relieves pressure accumulation due to any back-leakage from check valves located near the RCS piping.

Currently, the allowable set pressure is 582 to 618 psig and 10 cc/hr leakage is allowed. When tested in June, 1992, the as-found set point was determined to be 530 psig. No seat leakage was identified. The valve was adjusted and left set at 600 psig. When tested in October, 1994, the as-found set point was determined to be 600 psig. No seat leakage was identified. Since the as-found set point was the same as the ideal setpoint, the valve was left set at 600 psig.

In summary, the valve set point was found to be acceptable the last time it was tested, and no seat leakage has been identified in the last two tests. Therefore, there is a high degree of assurance that the valve will perform within allowed limits through the proposed extension period.

### Conclusion

Based on the above considerations, I&M has concluded that compliance with the specified requirements results in hardship without a compensating increase in the level of quality and safety. I&M has also concluded that the proposed alternative of a one-time test interval extension to 52 months for the 7 valve groups provides reasonable assurance that the affected safety valves will continue to perform their safety functions.

ATTACHMENT 2 TO C0901-02

COMMITMENTS

The following table identifies those actions committed to by Indiana Michigan Power Company (I&M) in this document. Any other actions discussed in this submittal represent intended or planned actions by I&M. They are described to the Nuclear Regulatory Commission (NRC) for the NRC's information and are not regulatory commitments.

Commitment	Date
The test interval immediately following the January, 2002 refueling outage will be 44 months for the 7 safety valve groups identified in this submittal. The test interval for the 7 valve groups will be 48 months thereafter.	The appropriate administrative controls will be established when the proposed alternative is implemented following approval by the NRC.