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INDIANA MICHIGAN POWER

July 26, 2004

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Docket Nos. 50-315
50-316

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop O-P1-17
Washington, D. C. 20555-0001

Donald C. Cook Nuclear Plant Units 1 And 2
NUCLEAR REGULATORY COMMISSION BULLETIN 2004-01
INSPECTION OF ALLOY 82/182/600 MATERIALS USED IN THE FABRICATION OF PRESSURIZER PENETRATIONS AND STEAM SPACE PIPING CONNECTIONS AT PRESSURIZED-WATER REACTORS
SIXTY-DAY RESPONSE

Reference: Nuclear Regulatory Commission Bulletin 2004-01, "Inspection of Alloy 82/182/600 Materials Used in the Fabrication of Pressurizer Penetrations and Steam Space Piping Connections at Pressurized-Water Reactors," dated May 28, 2004.

In Bulletin 2004-01, the Nuclear Regulatory Commission requested that pressurized-water reactor licensees provide a description of their plant's pressurizer penetrations and steam space piping connections, a description of their present pressurizer penetration and steam space piping connection inspection program, a description of the pressurizer penetration and steam space piping connection inspection program that will be implemented during the next and subsequent refueling outages, and a discussion of why the future inspection programs are adequate to assure that the reactor coolant system pressure boundary is maintained and applicable regulatory requirements are met. This information is to be provided within 60 days of the date of the bulletin.

Indiana Michigan Power Company's response to the request is provided in Attachment 1 to this letter. Attachment 2 provides the regulatory commitment

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made in this submittal. Should you have any questions, please contact Mr. John A. Zwolinski, Safety Assurance Director, at (269) 466-2428.

Sincerely,

Joseph N. Jensen
Site Vice President

Attachments: 1. Response to Nuclear Regulatory Commission Bulletin 2004-01
2. Commitment

RV/rdw

c: J. L. Caldwell, NRC Region III
K. D. Curry, Ft. Wayne AEP
J. T. King, MPSC
J. G. Lamb, NRC Washington, DC
MDEQ – WHMD/HWRPS
NRC Resident Inspector

AFFIRMATION

I, Joseph N. Jensen, being duly sworn, state that I am Site Vice President of Indiana Michigan Power Company (I&M), that I am authorized to sign and file this request with the Nuclear Regulatory Commission on behalf of I&M, and that the statements made and the matters set forth herein pertaining to I&M are true and correct to the best of my knowledge, information, and belief.

Indiana Michigan Power Company

Joseph N. Jensen
Site Vice President

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 26th DAY OF July, 2004

Julie E Newmiller
Notary Public

JULIE E. NEWMILLER
Notary Public, Berrien County, MI
My Commission Expires Aug 22, 2004

My Commission Expires 8-22-2004

Attachment 1 to AEP:NRC:4054-07
Response to Nuclear Regulatory Commission
Bulletin 2004-01

In Bulletin 2004-01, The Nuclear Regulatory Commission (NRC) requested that pressurized-water reactor (PWR) licensees provide a description of their plant's pressurizer penetrations and steam space piping connections, a description of their present pressurizer penetration and steam space piping connection inspection program, that will be implemented during the next and subsequent refueling outages, and a discussion of why the future inspection programs are adequate to assure that the reactor coolant system pressure boundary is maintained and applicable regulatory requirements are met.

Indiana Michigan Power Company's (I&M's) response to the request is provided below.

Requested Information (1)(a)

Provide a description of the pressurizer penetrations and steam space piping connections at your plant. At a minimum, this description should include materials of construction (e.g., stainless steel piping and/or weld metal, Alloy 600 piping/sleeves, Alloy 82/182 weld metal or buttering, etc.), joint design (e.g., partial penetration welds, full penetration welds, bolted connections, etc.), and, in the case of welded joints, whether or not the weld was stress-relieved prior to being put into service. Additional information relevant with respect to determining the susceptibility of your plant's pressurizer penetrations and steam space piping connections to primary water stress corrosion cracking (PWSCC) should also be included.

Response to (1)(a)

The pressurizer for Donald C. Cook Nuclear Plant (CNP) Units 1 and 2 is a cylindrical pressure vessel which is installed with its longitudinal axis in a vertical position. The upper head, which is hemispherical, is fabricated from manganese-molybdenum steel and is clad with austenitic stainless steel. The head contains one relief valve nozzle, three safety valve nozzles, one spray nozzle and one manway. The lower head, which is hemispherical, is fabricated from manganese-molybdenum steel and is clad with austenitic stainless steel. The lower head contains a surge nozzle and 78 penetrations for immersion heaters. The shell assembly is fabricated from manganese-molybdenum steel and is clad with austenitic stainless steel. The shell assembly contains eight instrument line connections (four for level and four for pressure) and one sample line connection.

The surge nozzle and the spray nozzle on each unit contain a thermal sleeve. The specific materials of construction for each vessel are contained in Table 1, "Unit 1 Pressurizer Materials of Construction" and Table 2, "Unit 2 Pressurizer Materials of Construction."

The immersion heaters and welds are fabricated from 316 stainless steel material, as are the instrument and sample line connections. No Alloy 600/82/182 material was used in the fabrication of the immersion heaters, instrument, or sample line connections.

The pressurizer nozzle safe ends were buttered with Alloy 82/182 prior to stress relief. The safe ends were then welded to the nozzles using Alloy 82/182 material and therefore did not receive the same stress relief as the Alloy 82/182 buttering. Figure 1 provides a sketch of the materials used for the Unit 1 and Unit 2 surge line nozzle-to-safe end fabrication. This figure is typical for both the surge and the spray line configuration. The relief and safety nozzle-to-safe ends are similar, but do not contain a thermal sleeve.

I&M had a susceptibility assessment of all Alloy 600/82/182 materials performed for Unit 1 and Unit 2. The assessment provides a generalized ranking of Alloy 600/82/182 materials used in the CNP reactor coolant system. The pressurizer penetrations are ranked the most susceptible for both Unit 1 and Unit 2 due to the higher temperatures at the pressurizer locations. The Unit 2 pressurizer penetrations are ranked as more susceptible than the Unit 1 pressurizer penetrations due to the higher Unit 2 operating temperatures.

Requested Information (1)(b)

Provide a description of the inspection program for Alloy 82/182/600 pressurizer penetrations and steam space piping connections that has been implemented at your plant. The description should include when the inspections were performed; the areas, penetrations, and steam space piping connections inspected; the extent (percentage) of coverage achieved for each location which was inspected; the inspection methods used; the process used to resolve any inspection findings; the quality of the documentation of the inspections (e.g., written report, video record, photographs); and, the basis for concluding that your plant satisfies applicable regulatory requirements related to the integrity of pressurizer penetrations and steam space piping connections. If leaking pressurizer penetrations or steam space piping connections were found, indicate what followup non-destructive examination (NDE) was performed to characterize flaws in the leaking penetrations.

Response to (1)(b)

Past Inspections

The Unit 1 and Unit 2 pressurizer penetrations and steam space piping connections have been examined as specified by the American Society of Mechanical Engineers Code, Section XI (ASME Section XI)), TABLE IWB-2500-1, "Examination Category B-F,

Pressure Retaining Dissimilar Metal Welds." The results of the examinations are provided in Tables 3 and 4, and summarized below.

Beginning with the first inservice inspection (ISI) interval, all of the dissimilar metal safe end welds for the pressurizers have received a volumetric (ultrasonic) and a surface (liquid penetrant) examination each inspection interval. Each refueling outage, the entire pressurizer is subjected to a VT-2 visual examination at normal operating pressure and temperature as specified by TABLE IWB-2500, "Examination Category B-P, All pressure retaining components." Additionally, insulation is removed from the pressurizer manway each refueling outage to allow VT-2 examination of the bolted connection as required by the 1989 Edition of ASME Section XI, Article IWA-5242, "Insulated Components."

An inspection history for Unit 1 is provided in Table 3, "Inspection History for Unit 1 Pressurizer." The Unit 2 inspection history is provided in Table 4, "Inspection History for Unit 2 Pressurizer."

Since 1990, all of the pressurizer dissimilar metal welds in the safe ends of the safety, relief, spray and surge line have received an augmented volumetric examination once per 10-year interval. The examinations were performed using 45 degree and/or 60 degree refracted longitudinal wave transducers as suggested by NRC Information Notice 90-30, "Ultrasonic Inspection Techniques for Dissimilar Metal Welds."

Beginning with the Unit 1 Cycle 19 Refueling Outage (2003), insulation has been removed at the safety, relief and spray nozzle safe end welds during depressurized conditions to allow a bare metal VT-2 examination for leakage. Similar inspections are planned during the Unit 2, Cycle 15 Refueling Outage (Fall, 2004). The decision to remove insulation at these locations resulted from the operating experience at Tsuruga Unit 2 in Japan where, in September, 2003, small amounts of boric acid were observed prior to a scheduled volumetric and surface examination of the safe end weld on a safety nozzle. The subsequent volumetric examination at Tsuruga revealed through-wall cracks that resulted from PWSCC. This event was later identified in NRC Information Notice 2004-011, "Cracking In Pressurizer Safety And Relief Nozzles And In Surge Line Nozzle."

Inspection Results

As noted in Tables 3 and 4, volumetric examination indications have been dispositioned as geometric reflectors for the following welds:

- 1-PRZ-20 - relief valve safe end (geometric reflector from inside diameter (ID) surface)

- 1-PRZ-23 - safety valve safe end (geometric reflector from ID surface)
- 1-PRZ-25 - surge line safe end (geometric reflector from the counter bore)
- 2-PRZ-22 - safety valve safe end (geometric reflector from weld root)
- 2-PRZ-23 - safety valve safe end (geometric reflector from weld root)

Surface examinations have not identified any indications.

Leakage was identified at the Unit 1 and Unit 2 pressurizer manways during the 1992 refueling outages. Inspections revealed that the manway pad carbon steel surfaces were eroded and some bolting indicated that steam cutting had occurred. Additionally, the clad gasket seating surface had some steam cutting that resulted in an uneven seating surface. The seating surfaces were repaired by machining, and the phonograph finish was restored.

There had been no identified leakage during the VT-2 examinations conducted since 1992 until March of 2004. With Unit 1 at 100 percent power, an increase of unidentified leakage in the reactor coolant system caused an investigation that led to the discovery of steam leakage at the Unit 1 pressurizer manway gasket. The unit was shutdown and depressurized and the manway was removed. Insulation was removed from the pressurizer shell to determine if the leak had impacted the integrity of the carbon steel outer surfaces of the pressurizer shell. Only minor degradation was observed outside the manway gasket seating surface. Dimensional measurements were taken at the degraded areas to ensure integrity of the remaining material was adequate without weld repairs.

The leakage was attributed to gasket aging, and the gasket was replaced and the manway reinstalled. A pressure test at normal operating pressure and temperature was performed and the manway was VT-2 examined with the insulation removed. No leakage was observed and the unit was returned to service.

Compliance with Regulatory Requirements

Compliance with the applicable regulatory requirements as identified in the bulletin is discussed below.

The CNP reactor coolant system was designed to CNP specific criteria rather than the general design criteria specified in 10 CFR 50, Appendix A. The CNP specific criteria applicable to the reactor coolant pressure boundary (RCPB) are:

Criterion 9 The RCPB shall be designed, fabricated, and constructed so as to have an exceedingly low probability of gross rupture or significant uncontrolled leakage throughout its design lifetime.

Criterion 33 The RCPB shall be capable of accommodating, without rupture, the static and dynamic loads imposed on any boundary component as a result of an inadvertent and sudden release of energy to the coolant.

Criterion 34 The RCPB shall be designed and operated to reduce to an acceptable level the probability of rapidly propagating type failure.

Criterion 36 RCPB components shall have provisions for inspection, testing, and surveillance of critical areas by appropriate means to assess the structural and leaktight integrity of the boundary components during their service lifetime.

The criteria were applied to the design of the CNP Unit 1 and Unit 2 pressurizer penetrations and steam space piping connections.

Consistent with 10 CFR 50.55a, CNP has an ISI program that conforms to the provisions of the 1989 edition of ASME Section XI. Consistent with 10 CFR 50, Appendix B, Criterion V, I&M has established procedures for the performance of RCPB ISI activities. Consistent with 10 CFR 50, Appendix B, Criterion IX, the special processes involved in the ISI program are controlled and accomplished by qualified personnel using qualified procedures to perform the inspections.

Consistent with 10 CFR 50, Appendix B, Criterion XVI, ISI findings are entered into the CNP corrective action program. Significant conditions adverse to quality, such as a through-wall leak require that a cause evaluation be performed.

Technical Specification (TS) 3.4.6.2 for both Unit 1 and Unit 2 prohibits operation with known RCPB leakage.

The design of the reactor coolant system components, the adherence to the ISI requirements of ASME Section XI, the TS requirement prohibiting operation with known RCPB leakage, and the requirements of the CNP corrective action program provide the basis for concluding that CNP Unit 1 and Unit 2 satisfy the regulatory requirements related to pressurizer penetration and steam space piping connection integrity.

Requested Information (1)(c)

Provide a description of the Alloy 82/182/600 pressurizer penetration and steam space piping connection inspection program that will be implemented at your plant during the next and subsequent refueling outages. The description should include the areas, penetrations and steam space piping connections to be inspected; the extent (percentage) of coverage to be achieved for each location; inspection methods to be used; qualification

standards for the inspection methods and personnel; the process used to resolve any inspection indications; the inspection documentation to be generated; and, the basis for concluding that your plant will satisfy applicable regulatory requirements related to the structural and leakage integrity of pressurizer penetrations and steam space piping connections. If leaking pressurizer penetrations or steam space piping connections are found, indicate what followup NDE will be performed to characterize flaws in the leaking penetrations. Provide your plans for expansion of the scope of NDE to be performed if circumferential flaws are found in any portion of the leaking pressurizer penetrations or steam space piping connections.

Response to (1)(c)

The following describes I&M's present plans for future inspections. As noted in NRC Bulletin 2004-01, the Electric Power Research Institute (EPRI) is coordinating a program to address material-related issues, and the NRC is working with the nuclear industry and other stakeholders to revise the ASME Code and NRC regulations. I&M's future inspections may be modified by information that is developed by the EPRI program and revisions to the ASME Code and NRC regulations.

Future Inspections

Beginning with the Unit 2 Cycle 15 Refueling Outage scheduled for the fall of 2004, insulation will be removed at all of the safety, relief, spray and surge line dissimilar metal welds and the welds will receive a 100 percent bare metal VT-2 examination at depressurized conditions. The examinations will be performed for Unit 1 during the Cycle 20 Refueling Outage scheduled for the spring of 2005. These examinations will continue each refueling outage until alternative strategies to address Alloy 600/82/182 concerns are implemented. These strategies may include one or more of the following:

- Weld Overlay with PWSCC immune material
- Mechanical stress improvement
- Removal of the Alloy 82/182 weld metal and rewelding with Alloy 52/152 material

I&M will continue removing insulation from the pressurizer manway bolted connection and performing 100 percent bare metal examinations by qualified VT-2 personnel during depressurized conditions each refueling outage as required by ASME Section XI, Article IWA-5242. A subsequent VT-2 examination will be performed at normal operating pressure and temperature with the insulation installed.

Personnel performing the VT-2 examinations are qualified in accordance with the 1989 Edition of ASME Section XI.

The ASME Section XI Examination Category B-F required volumetric and surface examinations of the dissimilar metal welds at the Safe Ends for the Safety, Relief, Spray and Surge lines will continue (each weld shall be examined once per Inspection Interval).

For the Unit 2 Cycle 15 refueling outage, the following are scheduled for volumetric and surface examination in addition to the bare metal VT-2 examinations performed as part of CNP's ISI program:

- 2-PRZ-24 - safety valve nozzle-to-safe end
- 2-PRZ-25 - relief valve nozzle-to-safe end

For the Unit 1 Cycle 20 refueling outage, the following, are scheduled for volumetric and surface examination in addition to the bare metal VT-2 examinations performed as part of CNP's ISI program:

- 1-PRZ-21 - safety valve nozzle-to-safe end
- 1-PRZ-22 - safety valve nozzle-to-safe end
- 1-PRZ-24 - spray line nozzle-to-safe end
- 1-PRZ-25 - surge line nozzle-to-safe end

Personnel performing the volumetric examinations, and the equipment used to perform the examinations, will be qualified in accordance with the 1995 or later editions of ASME Section XI, Appendix VIII. ASME Section XI, Appendix VIII requirements are met using Performance Demonstration Initiative (PDI), Supplement 10, "Dissimilar Metal Welds." Based on past inspection records and the improved techniques using PDI qualified personnel and equipment, the extent of coverage is expected to exceed 90 percent for each location.

Although not required by ASME Section XI, I&M intends to perform volumetric and surface examinations on all nozzle-to-safe end welds during Unit 2, Cycle 15 and Unit 1, Cycle 20 refueling outages.

I&M ISI and Design Engineering personnel closely follow and participate in ASME Section XI code meetings and have members on several ASME Code Committees, including the Task Groups on Boric Acid Corrosion, ISI Optimization, and Pressure Test. I&M personnel also attend the Task Group Alloy 600 meetings. I&M personnel are aware of the proposed rules related to inspection, evaluation, and frequencies being proposed for Alloy 600/82/182 materials. It is I&M's intent to voluntarily implement the final version of the proposed rules and Code Cases as they become available.

Additionally, I&M personnel participate in the EPRI Materials Reliability Program (MRP) for Alloy 600/82/182 materials. Actions imposed by the MRP or the Nuclear Energy Institute (NEI) for Alloy 600/82/182 inspections or program requirements will be evaluated for implementation at CNP as they become available.

I&M recognized that the inspection frequencies for Alloy 600/82/182 materials will most likely be increased by the proposed changes to ASME Section XI or MRP/NEI directives. CNP will continue to monitor and participate in these activities and implement the new requirements if applicable to CNP.

Resolution of Inspection Indications and Scope Expansion

Any through-wall pressure boundary leakage identified during the VT-2 will receive volumetric examination(s) to characterize the flaw. Additionally, all remaining pressurizer safe end welds will be volumetrically examined to determine the extent of the flaw and flaw types (e.g., axial, circumferential). I&M may also elect to perform a metallurgical analysis to determine the flaw initiation sites and flaw initiation mechanism (e.g., fabrication flaw, PWSCC, intergrannular stress corrosion cracking (IGSCC), etc.).

If non-geometric indications are discovered during volumetric or surface examinations, all remaining pressurizer safe end welds will be volumetrically examined to determine the extent of the flaw and flaw types (e.g., axial, circumferential). I&M may consider performing a metallurgical analysis to determine the flaw initiation sites and flaw initiation mechanism (e.g., fabrication flaw, PWSCC, IGSCC, etc.).

Inspection Documentation

All examinations will be documented via a written report that identifies the flaw, dimensional measurements of the flaw, and the resolution of the flaw. In the case of VT-2 identified leakage or indications identified during surface examinations, digital as-found images are to be included in the report. Inspection records for volumetric examinations will include calibration records, dimensional data, extent of coverage calculations and reviews, and disposition by an ASME Section XI qualified Level III examiner, Authorized Nuclear Inservice Inspector and I&M ISI program owner. Metallurgical analysis, if performed, will be included in the Condition Report documentation that will be generated for any flaws identified during an inspection and will be entered into the CNP corrective action program.

Compliance with Regulatory Requirements

The CNP regulatory requirements related to RCPB integrity are discussed in the response to (1)(b). The future inspection program discussed in this section complies with ASME

Section XI, Appendix VIII with the use of PDI qualified personnel, equipment and techniques are an improvement over previously performed volumetric examinations and are adequate to identify any PWSCC within the inspection boundary. The performance of volumetric and surface examinations during the Unit 1, Cycle 20 and the Unit 2, Cycle 15, Refueling Outages, ahead of the normal ASME Section XI schedule, exceeds the ASME Section XI requirements and the Materials Reliability Program recommendations. Additionally, the removal of insulation to perform a bare metal VT-2 examination exceeds the current regulatory and ASME Section XI requirements. The bare metal VT-2 provides additional assurance that the pressure boundary is being maintained for those components that do not receive a volumetric examination each refueling outage.

Requested Information (1)(d)

In light of the information discussed in this bulletin and your understanding of the relevance of recent industry operating experience to your facility, explain why the inspection program identified in your response to item (1)(c) above is adequate for the purpose of maintaining the integrity of your facility's RCPB and for meeting all applicable regulatory requirements which pertain to your facility.

Response to (1)(d)

I&M considers that the inspection program identified in response to item 1(c) is adequate for the purpose of maintaining the RCPB integrity and compliance with applicable regulatory requirements for Unit 1 and Unit 2. The basis for this conclusion is provided below.

The CNP reactor coolant system was designed to CNP specific design criteria rather than the general design criteria specified in 10 CFR 50, Appendix A. The CNP specific criteria applicable to the RCPB are:

Criterion 9 The RCPB shall be designed, fabricated, and constructed so as to have an exceedingly low probability of gross rupture or significant uncontrolled leakage throughout its design lifetime.

Criterion 33 The RCPB shall be capable of accommodating, without rupture, the static and dynamic loads imposed on any boundary component as a result of an inadvertent and sudden release of energy to the coolant.

Criterion 34 The RCPB shall be designed and operated to reduce to an acceptable level the probability of rapidly propagating type failure.

Criterion 36 RCPB components shall have provisions for inspection, testing, and surveillance of critical areas by appropriate means to assess the structural and leaktight integrity of the boundary components during their service lifetime.

The criteria were applied to the design of the CNP Unit 1 and Unit 2 pressurizer penetrations and steam space piping connections.

Consistent with 10 CFR 50.55a, CNP has an ISI program that conforms to the provisions of the 1989 edition of ASME Section XI. Consistent with 10 CFR 50, Appendix B, Criterion V, I&M has established procedures for the performance of RCPB ISI activities. Consistent with 10 CFR 50, Appendix B, Criterion IX, the special processes involved in the ISI program are controlled and accomplished by qualified personnel using qualified procedures to perform the inspections. Consistent with 10 CFR 50, Appendix B, Criterion XVI, ISI findings are entered into the CNP corrective action program. Significant conditions adverse to quality, such as a through-wall leak, require that a cause evaluation be performed.

TS 3.4.6.2 for both Unit 1 and Unit 2 prohibits operation with known RCPB leakage.

The design of the reactor coolant system components, the adherence to the ISI requirements of ASME Section XI (including the use of PDI qualified personnel, equipment and techniques), the TS requirement prohibiting operation with known RCPB leakage, and the requirements of the CNP corrective action program provide the basis for concluding that CNP Unit 1 and Unit 2 satisfy the regulatory requirements related to pressurizer penetration and steam space piping connection integrity.

Additionally, the performance of volumetric and surface examination ahead of schedule, and the removal of insulation to perform a bare metal VT-2 examination exceed the current regulatory and ASME Section XI requirements.

Based on the foregoing, I&M concludes that the future inspection program for the pressurizer penetrations and steam space piping connections is adequate for maintaining the Unit 1 and Unit 2 RCPB integrity and meeting applicable regulatory requirements.

Requested Information (2)

Within 60 days of plant restart following the next inspection of the Alloy 82/182/600 pressurizer penetrations and steam space piping connections, the subject PWR licensees should either:

(a) submit to the NRC a statement indicating that the inspections described in the licensee's response to item (1)(c) of this bulletin were completed and a description of the as-found condition of the pressurizer shell, any findings of relevant indications of through-wall leakage, followup NDE performed to characterize flaws in leaking penetrations or steam space piping connections, a summary of all relevant indications found by NDE, a summary of the disposition of any findings of boric acid, and any corrective actions taken and/or repairs made as a result of the indications found,

or

(b) if the licensee was unable to complete the inspections described in response to item (1)(c) of this bulletin, submit to the NRC a summary of the inspections performed, the extent of the inspections, the methods used, a description of the as-found condition of the pressurizer shell, any findings of relevant indications of through-wall leakage, followup NDE performed to characterize flaws in leaking penetrations or steam space piping connections, a summary of all relevant indications found by NDE, a summary of the disposition of any findings of boric acid, and any corrective actions taken and/or repairs made as a result of the indications found. In addition, supplement the answer which you provided to item (1)(d) above to explain why the inspections that you completed were adequate for the purpose of maintaining the integrity of your facility's RCPB and for meeting all applicable regulatory requirements which pertain to your facility.

Response to (2)

I&M will comply with this request by submitting the information described above to the NRC within 60 days of plant restart following the next scheduled inspections.

TABLE 1

UNIT 1 PRESSURIZER MATERIALS OF CONSTRUCTION

COMPONENT TYPE (QUANTITY)	PENETRATION/STEAM SPACE	MATERIALS OF CONSTRUCTION	CONNECTION TYPE	STRESS RELIEVED	SUSCEPTIBLE TO PWSCC
HEATER PENETRATIONS (78)	PENETRATION	TUBING: SA-213 TYPE 316 ADAPTER: SA-182 F316	PARTIAL PENETRATION	NO	NO
SAFETY VALVE NOZZLE-TO- SAFE END (3)	STEAM SPACE	NOZZLE: SA-216 GRADE WCC SAFE END: SA-182 F316-L WELD BUILD-UP: ALLOY 182 WELD FILLER: ALLOY 82 ROOT PASS WITH ALLOY 182	FULL PENETRATION	NO*	YES
RELIEF VALVE NOZZLE-TO-SAFE END (1)	STEAM SPACE	NOZZLE: SA-216 GRADE WCC SAFE END: SA-182 F316-L WELD BUILD-UP: ALLOY 182 WELD FILLER: ALLOY 82 ROOT PASS WITH ALLOY 182	FULL PENETRATION	NO*	YES
SPRAY NOZZLE-TO-SAFE END (1)	STEAM SPACE	NOZZLE: SA-216 GRADE WCC SAFE END: SA-182 F316-L WELD BUILD-UP: ALLOY 182 WELD FILLER: ALLOY 82 ROOT PASS WITH ALLOY 182	FULL PENETRATION	NO*	YES
SURGE LINE NOZZLE-TO-SAFE END (1)	PENETRATION	NOZZLE: SA-216 GRADE WCC SAFE END: SA-182 F316-L WELD BUILD-UP: ALLOY 182 WELD FILLER: ALLOY 82 ROOT PASS WITH ALLOY 182	FULL PENETRATION	NO*	YES
INSTRUMENT LINE CONNECTIONS (8)	PENETRATION (4) STEAM SPACE (4)	COUPLING: SA-182 TYPE 316 TUBING: SA-213 TYPE 316	PARTIAL PENETRATION	NO	NO
SAMPLE LINE CONNECTION (1)	PENETRATION	COUPLING: SA-182 TYPE 316 TUBING: SA-213 TYPE 316	PARTIAL PENETRATION	NO	NO
MAN WAY (1)	STEAM SPACE	SA-302 GRADE B CLASS 1 WITH SA-240 TYPE 304 INSERT	BOLTED	YES	NO

* The Alloy 82/182 weld buttering was stress relieved with the vessel, but the safe ends were added after stress relieving and therefore did not receive any post weld heat treatment.

TABLE 2

UNIT 2 PRESSURIZER MATERIALS OF CONSTRUCTION

COMPONENT TYPE (QUANTITY)	PENETRATION/STEAM SPACE	MATERIALS OF CONSTRUCTION	CONNECTION TYPE	STRESS RELIEVED	SUSCEPTIBLE TO PWSCC
HEATER PENETRATIONS (78)	PENETRATION	TUBING: SA-213 TYPE 316 ADAPTER: SA-182 F316	PARTIAL PENETRATION	NO	NO
SAFETY VALVE NOZZLE-TO- SAFE END (3)	STEAM SPACE	NOZZLE: SA-508 CLASS 2 (MN-MO) SAFE END: SA-182 F316-L WELD BUILD-UP: ALLOY 182 WELD FILLER: ALLOY 82 ROOT PASS WITH ALLOY 182	FULL PENETRATION	NO*	YES
RELIEF VALVE NOZZLE-TO-SAFE END (1)	STEAM SPACE	NOZZLE: SA-508 CLASS 2 (MN-MO) SAFE END: SA-182 F316-L WELD BUILD-UP: ALLOY 182 WELD FILLER: ALLOY 82 ROOT PASS WITH ALLOY 182	FULL PENETRATION	NO*	YES
SPRAY NOZZLE-TO-SAFE END (1)	STEAM SPACE	NOZZLE: SA-508 CLASS 2 (MN-MO) SAFE END: SA-182 F316-L WELD BUILD-UP: ALLOY 182 WELD FILLER: ALLOY 82 ROOT PASS WITH ALLOY 182	FULL PENETRATION	NO*	YES
SURGE LINE NOZZLE-TO-SAFE END (1)	PENETRATION	NOZZLE: SA-508 CLASS 2 (MN-MO) SAFE END: SA-182 F316-L WELD BUILD-UP: ALLOY 182 WELD FILLER: ALLOY 82 ROOT PASS WITH ALLOY 182	FULL PENETRATION	NO*	YES
INSTRUMENT LINE CONNECTIONS (8)	PENETRATION (4) STEAM SPACE (4)	COUPLING: SA-182 GRADE F- 316 TUBING: SA-213 TYPE 316	PARTIAL PENETRATION	NO	NO
SAMPLE LINE CONNECTION (1)	PENETRATION	COUPLING: SA-182 GRADE F-316 TUBING: SA-213 TYPE 316	PARTIAL PENETRATION	NO	NO
MAN WAY (1)	STEAM SPACE	SA-302 GRADE B CLASS 1 WITH SA-240 TYPE 304 INSERT	BOLTED	YES	NO

* The Alloy 82/182 weld buttering was stress relieved with the vessel, but the safe ends were added after stress relieving and therefore did not receive any post weld heat treatment.

TABLE 3

INSPECTION HISTORY FOR UNIT 1 PRESSURIZER

COMPONENT TYPE (QUANTITY)	ISI PROGRAM COMPONENT NUMBER	INSPECTION METHOD(S)	YEAR(S) PERFORMED OR LAST PERFORMED	PERCENT OF COVERAGE	INSPECTION RECORD QUALITY	INDICATIONS NOTED
HEATER PENETRATIONS (78)	N/A	VISUAL (VT-2)	PERFORMED EACH REFUELING OUTAGE WITH INSULATION IN PLACE LAST PERFORMED IN 2003	100%	WRITTEN REPORT	NO
SAFETY VALVE NOZZLE-TO- SAFE END (3) 1-PRZ-21 1-PRZ-22 1-PRZ-23	1-PRZ-21 1-PRZ-22 1-PRZ-23	VOLUMETRIC (UT) SURFACE (PT) VISUAL (VT-2)	1979, 1990, * 1979, 1990, * 1977, 1978, 1985, 1997, *	>90% FOR UT/PT 100% FOR VT-2	WRITTEN REPORT	YES***
RELIEF VALVE NOZZLE-TO-SAFE END (1)	1-PRZ-20	VOLUMETRIC (UT) SURFACE (PT) VISUAL (VT-2)	1982, 1985, 1997, *	>90% FOR UT/PT 100% FOR VT-2	WRITTEN REPORT	YES***
SPRAY NOZZLE-TO-SAFE END (1)	1-PRZ-24	VOLUMETRIC (UT) SURFACE (PT) VISUAL (VT-2)	1982, 1994, *	>90% FOR UT/PT 100% FOR VT-2	WRITTEN REPORT	NO
SURGE LINE NOZZLE-TO-SAFE END (1)	1-PRZ-25	VOLUMETRIC (UT) SURFACE (PT) VISUAL (VT-2)	1977, 1995, *	>90% FOR UT/PT 100% FOR VT-2	WRITTEN REPORT	YES***
INSTRUMENT LINE CONNECTIONS (8)	N/A	VISUAL (VT-2)	PERFORMED EACH REFUELING OUTAGE WITH INSULATION IN PLACE LAST PERFORMED IN 2003	100%	WRITTEN REPORT	NO
SAMPLE LINE CONNECTION (1)	N/A	VISUAL (VT-2)	PERFORMED EACH REFUELING OUTAGE WITH INSULATION IN PLACE LAST PERFORMED IN 2003	100%	WRITTEN REPORT	NO
MAN WAY (1)	N/A	VISUAL (VT-2)	LAST PERFORMED IN 2003**	100%	WRITTEN REPORT	NO

* Each component receives a VT-2 inspection each refueling outage with insulation in place at normal operating temperature and pressure. Beginning with the 2003 Unit 1 Cycle 19 Refueling Outage, insulation is removed and components are examined during depressurized conditions followed by a VT-2 inspection at normal operating pressure and temperature with the insulation in place.

** VT-2 inspections were performed each Refueling Outage since 1997 with the insulation removed during depressurized conditions and with the insulation installed at normal operating pressure and temperature.

*** Only geometric indications were observed on the following components: 1-PRZ-20, 1-PRZ-23 and PRZ-25. Since 1990, dissimilar metal welds have received an augmented volumetric inspection using 45 degree and/or 60 degree refracted longitudinal transducers.

TABLE 4

INSPECTION HISTORY FOR UNIT 2 PRESSURIZER

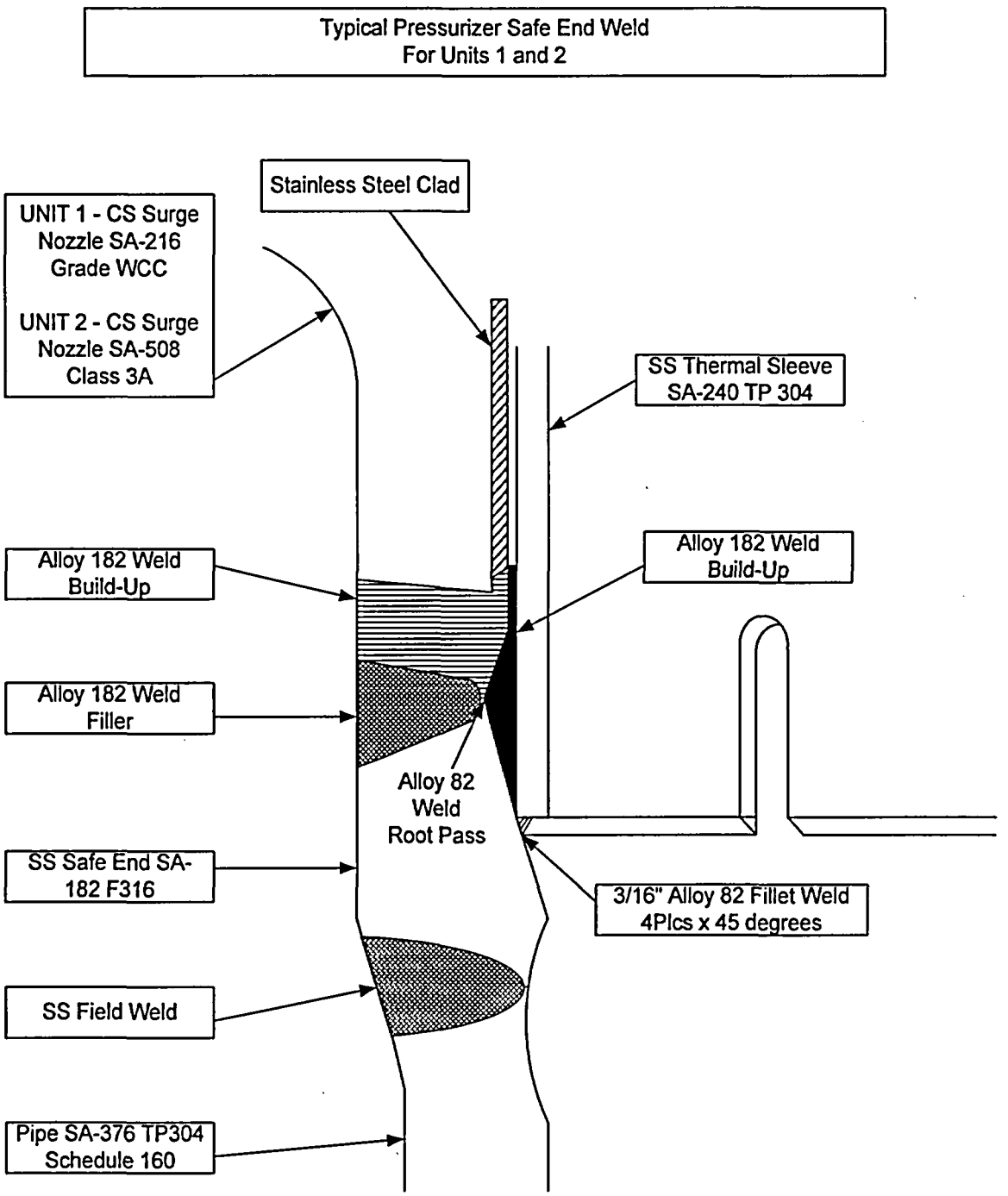
COMPONENT TYPE (QUANTITY)	ISI PROGRAM COMPONENT NUMBER	INSPECTION METHOD(S)	YEAR(S) PERFORMED OR LAST PERFORMED	PERCENT OF COVERAGE	INSPECTION RECORD QUALITY	INDICATIONS NOTED
HEATER PENETRATIONS (78)	N/A	VISUAL (VT-2)	PERFORMED EACH REFUELING OUTAGE WITH INSULATION IN PLACE LAST PERFORMED IN 2003	100%	WRITTEN REPORT	NO
SAFETY VALVE NOZZLE-TO- SAFE END (3)	2-PRZ-22 2-PRZ-23 2-PRZ-24	VOLUMETRIC (UT) SURFACE (PT) VISUAL (VT-2)	1979, 1988, 1997, * 1979, 1988, 1997, * 1988, 1990, *	>90% FOR UT/PT 100% FOR VT-2	WRITTEN REPORT	YES***
RELIEF VALVE NOZZLE-TO-SAFE END (1)	2-PRZ-25	VOLUMETRIC (UT) SURFACE (PT) VISUAL (VT-2)	1988, 1990, *	>90% FOR UT/PT 100% FOR VT-2	WRITTEN REPORT	NO***
SPRAY NOZZLE-TO-SAFE END (1)	2-PRZ-21	VOLUMETRIC (UT) SURFACE (PT) VISUAL (VT-2)	1986, 1994, *	>90% FOR UT/PT 100% FOR VT-2	WRITTEN REPORT	NO***
SURGE LINE NOZZLE-TO-SAFE END (1)	2-PRZ-26	VOLUMETRIC (UT) SURFACE (PT) VISUAL (VT-2)	1986, 1996, *	>90% FOR UT/PT 100% FOR VT-2	WRITTEN REPORT	NO***
INSTRUMENT LINE CONNECTIONS (8)	N/A	VISUAL (VT-2)	PERFORMED EACH REFUELING OUTAGE WITH INSULATION IN PLACE LAST PERFORMED IN 2003	100%	WRITTEN REPORT	NO
SAMPLE LINE CONNECTION (1)	N/A	VISUAL (VT-2)	PERFORMED EACH REFUELING OUTAGE WITH INSULATION IN PLACE LAST PERFORMED IN 2003	100%	WRITTEN REPORT	NO
MAN WAY (1)	N/A	VISUAL (VT-2)	LAST PERFORMED IN 2003**	100%	WRITTEN REPORT	NO

* Each component receives a VT-2 each refueling outage with insulation in place at normal operating temperature and pressure.

** VT-2 inspections were performed each Refueling Outage since 1997 with the insulation removed during depressurized conditions and with the insulation installed at normal operating pressure and temperature.

*** Only geometric indications were observed on the following components: 2-PRZ-22 and 2-PRZ-23. Since 1990, dissimilar metal welds have received an augmented volumetric inspection using 45 degree and/or 60 degree refracted longitudinal transducers.

FIGURE 1


Typical Pressurizer Safe End Weld
For Units 1 and 2
Stainless Steel Clad
UNIT 1 - CS Surge Nozzle SA-216 Grade WCC
UNIT 2 - CS Surge Nozzle SA-508 Class 3A
SS Thermal Sleeve SA-240 TP 304
Alloy 182 Weld Build-Up
Alloy 182 Weld Build-Up
Alloy 182 Weld Filler
Alloy 82 Weld Root Pass
SS Safe End SA-182 F316
3/16" Alloy 82 Fillet Weld 4Plcs x 45 degrees
SS Field Weld
Pipe SA-376 TP304 Schedule 160

ATTACHMENT 2 TO AEP:NRC:4054-07

COMMITMENT

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
I&M will submit the information requested in NRC Bulletin 2004-01, item (2).	Within 60 days of plant restart following the next scheduled inspections.