Entergy

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Fred Dacimo
Site Vice President
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May 25, 2004
NL-04-062

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

SUBJECT: Indian Point Nuclear Generating Units No. 2 and No. 3
Docket No. 50-247 and 50-286
Revised Relief Requests (RR-62 Rev 1 and RR 3-32 Rev 1)
Regarding Alternative Repair Methods (TAC MB 6116 / 6117)

References:

1. Entergy letter to NRC, IPN-02-068/NL-02-114, regarding "ASME Code Relief Requests to Use Alternative Repair Methods and NDE Techniques for Reactor Vessel Head Penetration Nozzles", dated August 21, 2002.

2. NRC letter to Westinghouse, "Acceptance for Referencing - Topical Report WCAP-15987-P, Revision 2, Technical Basis for the Embedded Flaw Process for Repair of Reactor Vessel Head Penetrations, (TAC NO. MB8997)", dated July 3, 2003.

3. NRC letter to Palo Verde NGS; regarding Relief Requests 20 and 21; Alternatives to Inservice Inspection Program Flaw Repair Requirements (TAC NOS. MB4498, MB4499, MB4500, MB4645, MB4646 and MB4647), dated September 25, 2003.

Dear Sir or Madam:

Entergy Nuclear Operations, Inc (Entergy) previously submitted two requests for relief in August 2002 (Reference 1) to use alternative repair methods and NDE techniques for reactor vessel head penetration nozzles. Relief request RR-62, Rev. 0 was for Indian Point Unit 2 (IP2) and RR 3-32, Rev. 0 was for Indian Point Unit 3 (IP3). Based on recent discussions with the NRC staff, Entergy is revising these relief requests.

In July 2003, the NRC issued a safety evaluation (Reference 2) approving use of Westinghouse Topical Report WCAP-15987-P, Revision 2 as acceptable for referencing in licensing applications. The WCAP provides an alternative to the 1989 Edition of Section III of the ASME Code and uses the embedded flaw process for repair of reactor vessel head penetrations, with certain limitations noted in the NRC safety evaluation. Entergy is submitting two revised requests for relief which propose as an alternative, the embedded flaw process for repair of reactor vessel head penetrations as described in WCAP-15987-P, Rev. 2. Details of the technical basis are provided in the enclosed requests for

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relief. Enclosure 1 is RR-62, Revision 1 for IP2 and Enclosure 2 is RR 3-32, Revision 1 for IP3. These revised requests for relief supersede and replace those previously submitted via Reference 1. NRC approved similar requests for relief in Reference 3.

The Inservice Inspection Code of Record for both IP2 and IP3, for their respective Third ISI Interval, is the 1989 Edition, No Addenda, of the ASME Section XI Code. The Original Construction Code for the IP2 and IP3 reactor vessels is ASME Section III, 1965 Edition, Summer 1965 Addenda. In accordance with IWA-4120(a), later editions and addenda of the ASME Section III Code are permitted for repairs. Entergy will be using the requirements of the 1989 Edition of ASME Section III for reactor vessel head penetration repairs, if needed, at IP2 and IP3. Since WCAP-15987-P, Rev. 2 was developed based on the 1989 Edition of the ASME Section III Code, any applicable conditions and exceptions to the 1989 Section III Code, as described in the WCAP and the NRC safety evaluation, will be followed. Therefore, a separate reconciliation of the differences between the original construction code and the 1989 Section III Code is not required.

Entergy will be performing inspections as required by the February 20, 2004, NRC First Revised Order (EA-03-009) for reactor pressure vessel head inspections during the next refueling outages. Approval of RR-62, Rev. 1 for IP2 is requested by September 15, 2004 to support the IP2 Fall 2004 refueling outage, in the event repairs are required in the reactor pressure vessel head penetrations and/or the attachment welds. Due to the similarity of these requests for relief, Entergy requests that approval of RR 3-32, Revision 1 for IP3 be granted at the same time.

There are no new commitments made in this letter. If you have any questions, please contact Mr. Kevin Kingsley at 914-734-6695.

Sincerely,

Fred Dacimo
Site Vice President
Indian Point Entergy Center

Enclosures:
1. Indian Point Generating Station Unit No. 2, RR-62, Revision 1.
2. Indian Point Generating Station Unit No. 3, RR 3-32, Revision 1.

cc: next page

cc:

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INDIAN POINT NUCLEAR GENERATING UNIT NO. 2
THIRD TEN-YEAR INTERVAL INSERVICE INSPECTION PROGRAM
RELIEF REQUEST RR-62, Rev. 1

Proposed Alternative
In Accordance with 10CFR50.55a(a)(3)(i)

--Alternative Provides Acceptable Level of Quality and Safety--

1. ASME Code Component(s) Affected

The reactor pressure vessel head (RPVH), which includes control rod drive mechanism (CRDM) penetrations (90), In-Core Instrumentation (ICI) penetrations (7), and one head vent penetration is an American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section III, Class 1 component.

2. Applicable Code Edition and Addenda

The Code of Record for the Third Inservice Inspection Interval is ASME Section XI Code, 1989 Edition, No Addenda.

Reactor Vessel Construction Code is ASME Section III, 1965 Edition, through Summer 1965 Addenda, including Code Cases 1332, 1335, 1339, and 1359.

3. Applicable Code Requirements

The 1989 edition of ASME XI, IWA-4120(a) states "*Repairs shall be performed in accordance with the Owner's Design Specification and the original Construction Code of the component or system. Later Editions and Addenda of the Construction Code or of Section III, either in their entirety or portions thereof, and Code Cases may be used.*" The applicable Construction Code is ASME Section III, 1965 Edition, through the Summer 1965 Addenda, including Code Cases 1332, 1335, 1339, and 1359. In accordance with IWA-4120(a), Entergy will follow the applicable requirements of the 1989 Edition of ASME Section III, in conjunction with the proposed alternatives as described in Section 5 below, for reactor vessel head penetration repairs.

BASE METAL DEFECT REPAIRS

ASME III, NB-4131 states that defects in base metals, such as the RPVH penetration tubes, may be eliminated or repaired by welding, provided the defects are removed, repaired and examined in accordance with the requirements of NB-2500.

ASME III, NB-2538 addresses elimination of base material surface defects and specifies defects are to be removed by grinding or machining. Defect removal must be verified by a magnetic particle or liquid penetrant examination using acceptance criteria of NB-2545 or NB-2546. If the removal process reduces the section thickness below the NB-3000 design thickness, then repair welding per NB-2539 is to be performed.

ASME III, NB-2539.1 addresses removal of defects and requires defects be removed or reduced to an acceptable size by suitable mechanical or thermal methods.

ASME III, NB-2539.4 provides the rules for examination of the base material repair welds and specifies they shall be examined by the magnetic particle or liquid penetrant methods with acceptance criteria per NB-2545 and NB-2546. Additionally, If the depth of the repair cavity exceeds the lesser of 3/8" or 10% of the section thickness, the repair weld shall be examined by the radiographic method using the acceptance criteria of NB-5320.

WELD METAL DEFECT REPAIRS,

ASME III, NB-4451 states defects in weld metal shall be eliminated and, when necessary, repaired per NB-4452 and NB-4453.

ASME III, NB-4452 addresses elimination of weld metal surface defects and specifies defects are to be removed by grinding or machining. Defect removal must be verified by a magnetic particle or liquid penetrant examination using acceptance criteria of NB-5340 or NB-5350. If the removal process reduces the section thickness below the NB-3000 design thickness, then repair welding per NB-4453 is to be performed.

ASME III, NB-4453.1 addresses removal of defects in welds and requires the defect removal be verified with magnetic particle or liquid penetrant examinations using acceptance criteria of NB-5340 or NB-5350, or in the case of partial penetration welds where the entire thickness of the weld is removed, and only a visual examination is required.

REQUESTED RELIEF

Relief is requested from the requirements of ASME Section XI, IWA-4120(a), to perform repairs on the RPVH penetrations per the rules of Construction Code.

Relief is requested from the requirements in ASME Section III, NB-4131, NB-2538 and NB-2539.1 to eliminate base material defects prior to repair welding.

4. Reason for Request

Entergy will be performing RPVH inspections during refueling outages to meet the requirements of the NRC First Revised Order EA-03-009 (Reference 1). Entergy is requesting this relief as a contingency in the event that flaws requiring repair are identified during these inspections. The proposed embedded flaw process as described in WCAP-15987-P-A (Reference 2), which incorporates the NRC Safety Evaluation (SE), and Reference 3 regarding J-groove weld inspection provide an acceptable alternative to repair reactor vessel head penetrations.

5. Proposed Alternative

Design, implementation of repairs, and inspections will be consistent with the information contained in References 2 and 3.

The embedded flaw repair overlay welds on the penetration J-groove welds will consist of a minimum of 3 deposited layers. The embedded flaw repair overlay welds on the inside diameter

(ID) and the outside diameter (OD) of the penetration tube material will consist of a minimum of 2 deposited layers of weld, consistent with References 2 and 3 to minimize welding induced residual stresses and material distortion. In the case of repairs on the ID surface, the 2 layer approach results in a reduced inlay excavation depth.

BASIS FOR USE

In the NRC SE incorporated in Reference 2, the NRC staff concluded that, subject to the specified conditions and limitations, the embedded flaw process proposed in the WCAP provides an acceptable level of quality and safety. The staff also concluded that the WCAP is acceptable for referencing in licensing applications.

In both cases of the ID and the OD overlay repair welds, the proposed substitute examination methods have been previously demonstrated to be adequate for flaw detection and sizing as shown in Reference 3.

The embedded flaw repair process is considered a permanent repair that will last through the useful life of the RPVH. As long as a primary water stress corrosion cracking (PWSCC) flaw remains isolated from the primary water environment the only known mechanism for any further potential propagation is fatigue. The calculated fatigue usage in this region is very low, because the reactor vessel head region is isolated from the transients that affect the hot leg or cold leg piping.

The thickness of the weld used to embed the flaw has been set to provide a permanent embedment of the flaw. The embedded flaw process imparts less residual stresses than weld repair following the complete removal of the flaw.

Since Alloy 52/152 (690) weldment is considered highly resistant to PWSCC, a new PWSCC crack should not initiate and grow through the Alloy 52/152 overlay to reconnect the primary water environment with the embedded flaw. The resistance of the alloy 690 material has been demonstrated by laboratory testing, and in approximately 10 years of operational service in steam generator tubes, where no PWSCC has been found.

Therefore, the embedded flaw repair process is considered to be an alternative to Code requirements that provides an acceptable level of quality and safety, as required by 10 CFR 50.55a(a)(3)(i).

6. Duration of Proposed Alternative

Entergy proposes to use the alternative for the remainder of the Third Inservice Inspection Interval for IP2.

7. Precedents

A similar request for relief was approved for Palo Verde Units 1, 2, and 3 (Reference 4).

8. References

1. U. S. Nuclear Regulatory Commission (NRC) Order EA-03-009, "Issuance of First Revised Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors," dated February 20, 2004.

2. Westinghouse Topical Report, WCAP-15987-P-A, Revision 2, "Technical Basis for the Embedded Flaw Process for Repair of Reactor Vessel Head Penetrations", dated December 2003.

3. Letter LTR-NRC-03-61 from J. S. Galembush (Westinghouse) to Terrence Chan (NRC) and Bryan Benney (NRC) dated October 1, 2003; Subject: "Inspection of Embedded Flaw Repair of a J-groove Weld."

4. NRC letter to Palo Verde NGS; regarding Relief Requests 20 and 21; Alternatives to Inservice Inspection Program Flaw Repair Requirements (TAC NOS. MB4498, MB4499, MB4500, MB4645, MB4646 and MB4647), dated September 25, 2003.

INDIAN POINT NUCLEAR GENERATING UNIT NO. 3
THIRD TEN-YEAR INTERVAL INSERVICE INSPECTION PROGRAM
RELIEF REQUEST RR 3-32, Rev. 1

Proposed Alternative
In Accordance with 10CFR50.55a(a)(3)(i)

--Alternative Provides Acceptable Level of Quality and Safety--

1. ASME Code Component(s) Affected

The reactor pressure vessel head (RPVH), which includes control rod drive mechanism (CRDM) penetrations (73), In-Core Instrumentation (ICI) penetrations (5), and one head vent penetration is an American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section III, Class 1 component.

2. Applicable Code Edition and Addenda

The Code of Record for the Third Inservice Inspection Interval is ASME Section XI Code, 1989 Edition, No Addenda.

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to an acceptable size by suitable mechanical or thermal methods.

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ASME III, NB-4453.1 addresses removal of defects in welds and requires the defect removal be verified with magnetic particle or liquid penetrant examinations using acceptance criteria of NB-5340 or NB-5350, or in the case of partial penetration welds where the entire thickness of the weld is removed, and only a visual examination is required.

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BASIS FOR USE

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Therefore, the embedded flaw repair process is considered to be an alternative to Code requirements that provides an acceptable level of quality and safety, as required by 10 CFR 50.55a(a)(3)(i).

6. Duration of Proposed Alternative

Entergy proposes to use the alternative for the remainder of the Third Inservice Inspection Interval for IP3, through.

7. Precedents

A similar request for relief was approved for Palo Verde Units 1, 2, and 3 (Reference 4).

8. References

1. U. S. Nuclear Regulatory Commission (NRC) Order EA-03-009, "Issuance of First Revised Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors," dated February 20, 2004.

2. Westinghouse Topical Report, WCAP-15987-P-A, Revision 2, "Technical Basis for the Embedded Flaw Process for Repair of Reactor Vessel Head Penetrations", dated December 2003.

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