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Clinton Power Station

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U-603409

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September 21, 2000

Docket No. 50-461

Document Control Desk
Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Clinton Power Station Followup Information Regarding ASME Section XI
Relief Requests for Containment Inspection Requirements and
Visual Examination Requirements for Bolted Connections

Dear Sir or Madam:

By letter dated May 25, 2000 (Letter U-603352), AmerGen Energy Company, LLC (AmerGen) submitted several requests for relief from requirements of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (the Code). These requests, which are currently under review by the NRC staff, include a request for relief from the visual examination requirements of the Code, 1989 Edition, Paragraph IWA-5250, for bolted connections. The remainder of the requests concern the containment inspection requirements of 10CFR50.55a(g)(6)(ii)(B)(1) as amplified by the Code, Subsection IWE and IWL, 1992 Edition with 1992 Addenda.

During NRC review of AmerGen's relief requests, the NRC staff identified several comments, questions, and/or requests for additional information concerning some of the requests, which require responses from AmerGen. Accordingly, the responses and information are hereby provided in Attachment 1. In some cases, the responses and/or clarifying information prompted AmerGen to revise the associated relief request. All revised relief requests are provided in Attachment 2.

As noted in our May 25, 2000 letter, AmerGen is requesting NRC review and approval of these relief requests by October 1, 2000 to support finalization of the examination plan for the Clinton Power Station refueling outage scheduled to begin October 14, 2000.

A047

Sincerely yours,

A handwritten signature in black ink, appearing to read "MA Reandean". The signature is written in a cursive style with a large, prominent "M" and "R".

Michael A. Reandean
Director-Licensing

TBE/blf

Attachments

cc: NRC Clinton Licensing Project Manager
Regional Administrator, USNRC Region III
NRC Resident Office, V-690
Illinois Department of Nuclear Safety

**Responses to NRC Questions Concerning ASME
Section XI Relief Requests**

Responses to Questions Concerning IWE/IWL Relief Requests
CIP-6103, CIP-6104, CIP-6105, and CIP-6107

NRC Question/Comment

For Relief Requests CIP-6103, “Preservice Examination of Reapplied Paint or Coatings,” and CIP-6104, “Visual Examination Prior to Paint or Coating Removal,” provide additional information on the Clinton Power Station Coating Inspection Program.

Clinton Response

The coatings inside the primary containment structure are considered safety-related. They are applied and inspected in accordance with the Clinton Power Station (CPS) Quality Assurance Program. This program, described in Section 6.1.2.1 of the Clinton Power Updated Safety Analysis Report (USAR), identifies that CPS complies with NRC Regulatory Guide 1.54, Rev. 0 (June 1973), “Quality Assurance Requirements for Protective Coatings Applied to Water-Cooled Nuclear Power Plants”.

Regulatory Guide 1.54 describes a method to comply with the requirements of 10CFR Part 50, Appendix B, and invokes several ANSI Standards, including:

- ANSI N101.2, “Protective Coatings (Paints) for Light Water Nuclear Reactor Containment Facilities” *
- ANSI N101.4, “Quality Assurance for Protective Coatings Applied to Nuclear Facilities”
- ANSI N5.12, “Protective Coatings for the Nuclear Industry”

In addition, the following requirements are applicable to the CPS coatings program:

- The quality assurance requirements of Regulatory Guideline 1.54 applicable to the coating manufacturer are imposed on the coating manufacturer through the procurement process.
- Quality Assurance is responsible for auditing coating manufacturer’s program, and for providing Quality Control inspection services when specified.
- Quality Control Coatings Inspection personnel are certified in accordance with ANSI N45.2.6-1978 to perform inspections to verify conformance to the coating application procedures. In addition, Quality Control Receipt Inspection personnel are certified in accordance with ANSI N45.2.6-1978 to perform receipt inspection of coating materials.
- Coating systems and corresponding surface preparation systems are selected in accordance with requirements specified in CPS design documents and/or design drawings.

* Note: ANSI N5.12 replaced ANSI N5.9, referenced in ANSI N101.2, in 1974, prior to CPS obtaining a construction permit.

- Coating application procedures are developed based on the manufacturer's recommendations for application of the selected coating systems.
- Coating applicators are qualified to ANSI N101.4 and are required to complete the requirements specified in the Facilities Training Program as administered by a designated Qualifying Agent.
- A general walkdown to monitor the condition of safety-related coatings in the primary containment structure is performed by a Level III Coatings Inspector every outage, with the results reviewed by qualified structural engineers.
- Any structures that are not part of the general walkdown of safety-related coatings, or areas where inspection results are inconclusive, will be walked down and documented during periodic monitoring performed in accordance with Nuclear Station Engineering Department Procedure CS-09, "Monitoring of Significant Structures," to be in compliance with 10CFR50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." This periodic monitoring is performed at least once every four (4) refueling outages, not to exceed every ten years, and monitors the condition of coatings on both concrete and steel surfaces in order to identify general coating failures.
- Documentation demonstrating conformance to the above is maintained at CPS.

NRC Question/Comment

For Relief Request CIP-6105, "VT-2 Examination After Repair, Replacement, or Modification":

- (1) Provide additional information on the Clinton Power Station, ASME Section XI, Repair/Replacement Program, and
- (2) Include in the description what type of visual examination would be performed (in lieu of a VT-2 examination) following any repair or replacement affecting the containment pressure boundary.

Clinton Response to (1)

Clinton Power Station's ASME Section XI Repair/Replacement Program is described in Nuclear Station Engineering Department Procedure I.4. This program provides the administrative instructions for satisfying the requirements of the ASME Code, Section XI, as applicable to repairs and replacements of Class 1, 2, 3, and MC components and their supports. This procedure addresses the need for satisfying the original construction code requirements, pressure testing of components following repair or replacement, and Preservice Inspections required of repaired or replaced components.

For example, a repair of a Class MC component would be implemented (as required by the repair and replacement program) in accordance with the rules of the original construction code. After completion of the repair/replacement, the original construction code required NDE would be performed. Following this, the ASME Section XI requirement for Preservice Inspection (PSI) would be performed, in accordance with the Containment Inservice Inspection Program. As required by Section XI, the method of inspection for PSI would be the method originally used to

subsequent Inservice Inspections (ISI). In the case of Class MC components, this method would normally be the visual (VT-3) method or a visual weld examination. If the repaired or replaced area were Category E-C, Containment Surfaces Requiring Augmented Examination, then the method of inspection for the PSI would be the Visual VT-1 method or Ultrasonic Testing (UT). These examinations would confirm the structural integrity of the repair or replaced area of the containment.

Confirmation of the leak-tight integrity of the area will then be verified by either a Type A Test or by a Local Leak Rate Test of the affected area. Leakage rate testing would be conducted, as applicable, in accordance with 10 CFR 50, Appendix J. The leakage rate testing would be conducted by personnel trained in the methods of testing the containment vessel, as required by Appendix J, utilizing equipment and procedures routinely used for the periodic leakage rate testing of the containment.

Performance of VT-2, visual examination, during the conduct of a 10CFR50 Appendix J test would in most cases be impractical, due to accessibility (as in the case of the containment liner). Access to perform the visual examination of the repaired/replaced area is normally prohibited by either encapsulation of the test boundary (i.e. Local Leak Rate Test) or personnel access restrictions into containment during testing (Integrated Leak Rate Test). VT-2 examination of the repaired/replaced area from the outside surface of the containment (during the pressure test) would be meaningful and practical in some cases. However, most areas of the containment liner are inaccessible on the outside surface. Further, 10 CFR 50, Appendix J acceptance criteria for the results of the leakage testing assures that the leak tight integrity of the containment vessel is maintained.

The above described original construction examinations, PSI/ISI examinations and leakage rate testing, as well as the examinations identified in Relief Request CIP-6105, Revision 1, assures that the structural integrity and leak-tight integrity of the primary containment will be maintained following any repairs, replacements, or modification of the pressure boundary.

Clinton Response to (2)

Based on further discussion with the NRC staff, Relief Request CIP-6105 has been revised to include requiring performance of a general visual examination or detailed visual examination for any repair or replacement affecting the containment pressure boundary.

Revised Relief Request CIP-6105 (Revision 1) is provided in Attachment 2.

NRC Question/Comment

For Relief Request CIP-6107, "Bolt Torque or Tension Test Requirements," provide additional information on what would be done if a suspect area was found, and provide additional justification of the hardship in strictly conforming to the associated code requirement.

Clinton Response

As required by the ASME Code Section XI, Clinton Power Station will examine exposed surfaces of bolting material for defects that could cause the bolted connection to violate either the required leak tightness or structural integrity. Defective components will be replaced.

If general, visual examination reveals areas that are suspect, so a VT-1 examination shall be performed as required, and if necessary, supplemental examination shall be performed by either surface or volumetric examination. This also may include disassembly of the joint and performance of additional VT-1 examination. The bolted connection will be accepted by examination, repair, replacement, or evaluation.

Any repair/replacement and re-examination will be performed in accordance with the Clinton Power Station Repair Replacement Program. (See discussion on repair/replacement program for response to CIP-6105.)

The performance of visual examinations and torque/tension tests on bolted connections in accordance with the 1992 Edition through 1992 Addenda of ASME Section XI represents a hardship with no compensating increase in the level of quality and safety. The reexamination of bolted connections that are already examined as part of examination category E-A, and tested in accordance with 10 CFR 50, Appendix J, unnecessarily increases the number of inservice examinations and the associated radiation exposure to personnel. Verification of torque or tension values on bolted joints that are proven adequate through Appendix J testing would also use maintenance resources unnecessarily. Thus, strict compliance with the specified code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Response to Question/Request Concerning Relief Request 1202

NRC Question/Comment

Describe in further detail what actions will be taken if leakage from a bolted connection is identified and must be evaluated for joint integrity. Provide the criteria by which such an evaluation would be performed, and describe what action would be taken if evaluation per the test criteria necessitates further evaluation or actions.

Clinton Response

Appropriate criteria for evaluating leakage identified at bolted connections has been incorporated into Relief Request 1202. The criteria include consideration of the number of bolts and condition of the bolting, bolting and component material, leakage location and system function, corrosiveness of process fluid, radiological condition, previous bolting inspection result, visual evidence of corrosion at the assembled connection, and leakage monitoring. The action to be taken if leakage evaluation requires further action has also been incorporated. Specifically, if any of the incorporated evaluation criteria indicates a need for further evaluation/actions, the bolt closest to the source of leakage shall be removed and receive a VT-1 Examination and evaluated in accordance with IWA-3100. If the bolt has evidence of degradation, all remaining bolting shall be inspected or replaced.

Revised Relief Request 1202 (Revision 2) is provided in Attachment 2.

Revised Relief Requests

Relief Request CIP-6105 (Revision 1)
Relief Request 1202 (Revision 2)

Clinton Power Station

ASME Section XI Relief Request

RELIEF REQUEST CIP-6105 (Revision 1)

VT-2, Visual Examination After Repair, Replacement or Modification

SYSTEM/ COMPONENT(S) FOR WHICH RELIEF IS REQUESTED

All components subject to the rules and requirements for repair, replacement or modification of Class MC, IWE-5000 System Pressure Test visual examination in accordance with the 1992 Edition, 1992 Addenda of ASME Section XI.

CODE REQUIREMENT

Paragraph IWE-5240 of the 1992 Edition, 1992 Addenda of ASME Section XI requires that the requirements of Paragraph IWA-5240 for visual (VT-2) examination are applicable following repair, replacement, or modification.

CODE REQUIREMENT FROM WHICH RELIEF IS REQUESTED

Relief is requested from performing the VT-2 visual examination in connection with system pressure testing following repair, replacement or modification under Article IWE-5000.

BASIS FOR RELIEF

Relief is requested in accordance with 10 CFR 50.55a(a)(3)(i). Pressure (leak rate) testing in accordance with 10 CFR 50, Appendix J, provides an adequate level of safety and quality.

ALTERNATE EXAMINATIONS

Testing shall be conducted in accordance with 10CFR50, Appendix J, in lieu of Paragraph IWE-5240 of ASME Section XI. In addition, examinations following repairs or replacements on containment components will be performed in accordance with the Clinton Power Station ASME Section XI Repair/Replacement Program. Following the Repair/Replacement activity, the original construction code required NDE would be performed as well as required visual examinations to re-establish Preservice Inspection in accordance with the Containment Inspection Program.

After any repair or replacement affecting the containment pressure boundary, if a pressure test (Type A, Type B, or Type C) is performed to verify the leak tight integrity of the affected pressure boundary, a general visual examination of the accessible areas shall be performed during or after the pressure test to ensure the overall integrity of the repaired/replaced component with the containment.

For any repair or replacement affecting the containment pressure boundary, where a pressure test is deferred or not performed, a VT-1 or detailed visual examination shall be performed to ensure the overall integrity of the repaired/replaced component with the containment.

JUSTIFICATION FOR THE GRANTING OF RELIEF

10 CFR 50.55a was amended in the Federal Register (61FR41303) to require the use of the 1992 Edition, 1992 Addenda, of Section XI when performing containment examinations. Paragraph IWE-5210 states that except as noted within Paragraph IWE-5240, the requirements of Article IWA-5000 are not applicable to Class MC or Class CC components. Paragraph IWE-5240 states that the requirements of Paragraph IWA-5240 (corrected from IWA-5246 to IWA-5240 in the 1993 Addenda) for visual examinations are applicable. Paragraph IWA-5240 identifies a "VT-2" visual examination. VT-2 examinations are conducted to detect evidence of leakage from pressure retaining components, with or without leakage collection systems, as required during the conduct of a system pressure test. In addition, personnel performing VT-2 examinations are required to be qualified in accordance with Subarticle IWA-2300 of ASME Section XI.

Table IWE-2500-1, Examination Category E-P, identifies the examination method of 10 CFR 50, Appendix J and does not specifically identify a VT-2 visual examination. 10 CFR 50, Appendix J provides requirements for testing as well as acceptable leakage criteria. These tests are performed by Appendix J "Test" personnel and utilize calibrated equipment to determine acceptability. Additionally, 10 CFR 50.55a(b)(2)(x)(E) requires a general visual examination of the containment each period that would identify any structural degradation that may contribute to leakage. A "VT-2" visual examination will not provide additional assurance of safety beyond that of current Appendix J practices.

IMPLEMENTATION SCHEDULE

Station.

Relief is requested for the first ten-year IWE inspection interval of the Containment Inspection Program for Clinton Power

Clinton Power Station

ASME Section XI Relief Request

RELIEF REQUEST 1202 (Revision 2)

Leakage at Bolted Connections

SYSTEM/ COMPONENT(S) FOR WHICH RELIEF IS REQUESTED

All ASME Class 1, 2, and 3 systems which are subject to pressure testing in accordance with Section XI, 1989 Edition, IWA-5000.

CODE REQUIREMENT

ASME Section XI, 1989 Edition, Paragraph IWA-5250(a)(2) requires that "if leakage occurs at a bolted connection, the bolting shall be removed, VT-3 visually examined for corrosion, and evaluated in accordance with IWA-3100."

CODE REQUIREMENT FROM WHICH RELIEF IS REQUESTED

Pursuant to 10CFR50.55a(a)(3) relief is requested from removal of the bolting and performance of a VT-3 Visual Examination for corrosion and evaluation in accordance with IWA-3100 when leakage is detected.

BASIS FOR RELIEF

Removal of pressure retaining bolting at mechanical connections for visual, VT-3 examination and subsequent evaluation in locations where leakage has been identified is not always the most prudent course of action to determine condition of the bolting and/or the root cause of the leak.

In addition, later Editions of ASME Section XI have clarified the Code intent and requirement as follows:

"If leakage occurs at a bolted connection in a system bolated for the purpose of controlling reactivity, one of the bolts shall be removed, VT-3 examined, and evaluated in accordance with IWA-3100. The bolt selected shall be the one closest to the source of leakage. When the removed bolt has evidence of degradation, all remaining bolting in the connection shall be removed, VT-3 examined, and evaluated in accordance with IWA-3100."

With the Code change it is clear the primary concern is with bolting in bolated systems used to control reactivity. Therefore the code requirement in the 1989 Edition to remove and inspect bolting in all systems is excessively restrictive and would result in a hardship without a compensating level of quality and safety. The alternative proposed will provide an acceptable level of quality and safety.

ALTERNATE EXAMINATIONS

As an alternative to IWA-5250(a)(2) CPS will perform the following actions when leakage is identified at bolted connections:

1. The leakage shall be stopped in accordance with approved maintenance procedures, or;
2. If the leakage is not stopped, the joint shall be evaluated for joint integrity. This evaluation shall consider the following criteria:
 - Number and condition of bolting
 - Bolting and component material
 - Leakage location and system function
 - Corrosiveness of process fluid
 - Radiological conditions
 - Previous bolting inspection results
 - Visual evidence of corrosion at the assembled connection
 - Leakage monitoring

If any of the above parameters indicates a need for further evaluation, the bolt closest to the source of leakage shall be removed and receive a VT-1 Examination and evaluated in accordance with IWA-3100. If the bolt has evidence of degradation, all remaining bolting shall be inspected or replaced.

JUSTIFICATION FOR THE GRANTING OF RELIEF

Removal and inspection of bolting, can result in a system or portions of a system being placed in a mode of inoperation, limited condition of operation (LCO), or place the plant in a

shutdown condition. This constitutes a significant level of risk and burden on the plant without a compensating level of quality and safety.

At Clinton, general plant use bolting is purchased to a procurement standard using ASME Class 1 criteria and all bolting is visually examined thru the procurement process.

Pressure testing requires that the visual examination (VT-2) be performed at nominal operating pressure but states that temperature shall not exceed limiting conditions for the hydrostatic test curve as contained in the plant Technical Specifications. CPS expects a minimal amount of leakage during pressure testing from bolted connections during pressure testing, primarily due to the lower testing temperature. The majority of leakage identified during testing is from packing leaks but a small percentage is attributed to flange connections and other pressure retaining bolted connections. Usually this leakage is arrested as the plant heats up or additional torquing is performed to stop the leakage. In those cases where leakage is not arrested based on the above actions an evaluation is performed and, when necessary, corrective measures taken.

IMPLEMENTATION SCHEDULE

Relief is requested for the second ten-year interval at Clinton Power Station.