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U-603410
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Docket No. 50-461

10CFR50.55a

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

Subject: Clinton Power Station ASME Section XI Relief Requests Regarding
Performance Demonstration for Ultrasonic Examination Systems and Personnel

Dear Madam or Sir:

Attached for NRC review and approval are five requests for relief from requirements of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. Relief Requests 4202 through 4205 are for relief from portions of the ASME Section XI, Appendix VIII requirements. A fifth relief request, Relief Request 4206, is for relief from part of ASME Section XI, Appendix VII requirements.

Sincerely yours,

Paul D. Hinnenkamp
CPS Plant Manager

RWC/blf

Attachment

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

A047

Clinton Power Station

ASME Section XI Relief Request

RELIEF REQUEST 4202 (Revision 0)

Length Sizing Qualification Criteria

SYSTEM/ COMPONENT(S) FOR WHICH RELIEF IS REQUESTED

Examination Category B-A, Reactor Vessel Welds, Item No. B1.10 Longitudinal and Circumferential shell welds and B1.20 Head Welds subject to Appendix VIII, Supplement 4, examination.

CODE REQUIREMENT

ASME Section XI, 1995 Edition with 1996 Addenda, Appendix VIII, Supplement 4, subparagraph 3.2(b), length sizing qualification criteria requires that flaw lengths estimated by ultrasonic examination be the true length - 1/4 inch, + 1.0 inch. 10CFR50.55a(b)(2)(xv)(C)(1) requires a depth sizing requirement of 0.15 inch root mean square (RMS) be used in lieu of the requirements of subparagraph 3.2(b) to Supplement 4 to Appendix VIII of Section XI, 1995 Edition with 1996 Addenda.

RELIEF REQUESTS/JUSTIFICATION

Relief is requested per 10CFR50.55a(a)(3)(i) to use a length sizing qualification criterion of 0.75 inch RMS instead of the true length -1/4 inch + 1.0 inch or a depth size of 0.15 inch RMS.

On January 12, 2000, members of the NRC staff, representatives from the Electric Power Research Institute (EPRI) Nondestructive Examination Center, and representatives from the Performance Demonstration Initiative (PDI) industry group participated in a conference call. The discussion during the conference call dealt with the differences between requirements in Supplement 4, "Qualification Requirements for the Clad/Basemetal Interface of Reactor Vessel", to Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems," requirements in 10CFR50.55a(b)(2)(xv)(C)(1) in the Rule (Federal Register, 64 FR 51370), and requirements in the implementation of Supplement 4 by the PDI Program. Supplement 4, Subparagraph 3.2(b) imposed a flaw sizing tolerance of -1/4 inch, +1.0 inch of the true length for the performance demonstration qualification criteria. 10CFR50.55a(b)(2)(xv)(C)(1) imposes a depth sizing requirement of 0.15 inch RMS in lieu of subparagraph 3.2(b), and the PDI program uses a length sizing tolerance of 0.75 inch RMS for paragraph 3.2(b). The NRC staff acknowledged that 10CFR50.55a(b)(2)(xv)(C)(1) was in error and the length sizing tolerance should

have been 0.75 inch RMS, i.e., the same tolerance that is being implemented by the PDI program.

The U.S. nuclear utilities created the PDI industry group to implement demonstration requirements contained in Appendix VIII. The PDI developed a performance demonstration program for qualifying UT techniques. In 1995, the NRC staff performed an assessment of the PDI program and reported that the PDI was using a length sizing tolerance of 0.75 inch RMS for reactor pressure vessel performance demonstrations. This criterion was introduced to reduce testmanship (passing the test based on manipulation of results rather than skill). The staff noted in the assessment report dated March 6, 1996, that the length sizing tolerance was not in accordance with Appendix VIII, but the staff did not take exception to PDI's implementation of the 0.75 inch RMS length sizing tolerance. The staff requested that the length sizing difference between PDI and the ASME Code be resolved.

The solution for resolving the differences between the PDI program and the ASME Code was for the PDI industry group to participate in development of a code case that reflected the PDI requirements. The code case was developed, approved by the ASME, and published as Code Case N-622, "Ultrasonic Examination of RPV and Piping, Bolts and Studs, Section XI, Division 1."

Operating in parallel with the actions of PDI, the staff incorporated most of Code Case N-622 criteria in the rule published in the Federal Register, 64 FR 51370. In a conference call on January 12, 2000, PDI identified the omission of the length sizing tolerance in 10CFR50.55a(b)(2)(xv)(C)(1). The staff agreed that the omission of the length sizing tolerance of 0.75 inch RMS in the rule was an oversight, and the inclusion of depth sizing tolerance to Paragraph 3.2(b) of Supplement 4 to Appendix VIII was an error. The staff will correct the error in an upcoming rule change.

The use of the length sizing tolerance of 0.75 inch RMS provides an acceptable level of quality and safety as previously determined by the PDI industry group and ASME.

ALTERNATE EXAMINATIONS

identified in the PDI Program.

Clinton Power Station will use a length sizing qualification criteria of 0.75 inch Root Mean Square Error (RMSE) as

IMPLEMENTATION SCHEDULE

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

Clinton Power Station
ASME Section XI Relief Request
RELIEF REQUEST 4203 (Revision 0)
Examination of Austenitic Stainless Steel From One Side

SYSTEM/ COMPONENT(S) FOR WHICH RELIEF IS REQUESTED

Austenitic stainless steel piping welds with single side access, subject to ultrasonic examination demonstration per Supplement 2 of Appendix VIII to the 1995 Edition with 1996 Addenda of ASME Section XI for Examination Category B-J, Pressure Retaining Welds in piping (austenitic piping only) and Examination Category C-F-1, Pressure Retaining welds in austenitic stainless steel.

CODE REQUIREMENT

10CFR50.55a(b)(2)(xvi)(B) requires that examinations performed from one side of an austenitic stainless steel pipe weld must be conducted with equipment, procedures, and personnel that have demonstrated proficiency with single-side examinations.

RELIEF REQUESTS/JUSTIFICATION

Relief is requested per 10CFR50.55a(a)(3)(i) to perform examination from one side of an austenitic stainless steel pipe weld without demonstrating proficiency with single-side examinations on an austenitic stainless steel pipe weld.

Current technology is not capable of reliably detecting or sizing flaws on the far side of an austenitic weld. CPS believes that there are currently no qualified procedures or personnel in the Performance Demonstration Qualification Summary (PDQS).

The Performance Demonstration Initiative (PDI) program has austenitic stainless steel specimen(s) meeting Appendix VIII requirements. However, procedures and personnel have not been qualified yet because the current technology does not detect and size flaws located on the far side of the weld. The PDI program prescribes a best effort qualification instead of a complete single-side qualification. Utilizing the best effort approach provides sufficient assurance to detect the flaws. Therefore, this best efforts approach provides an adequate level of quality and safety.

ALTERNATE EXAMINATIONS

On austenitic pipe weld where access is not available from both sides of a weld, Clinton Power Station will perform, based on a best efforts basis, the required UT examination from one side of the pipe.

IMPLEMENTATION SCHEDULE

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

Clinton Power Station
ASME Section XI Relief Request
RELIEF REQUEST 4204 (Revision 0)
Qualification of Ultrasonic Examination Personnel

SYSTEM/ COMPONENT(S) FOR WHICH RELIEF IS REQUESTED

1995 Edition with 1996 Addenda.

All ASME Code Class 1, 2 components subject to ultrasonic examination in accordance with the ASME Section XI,

CODE REQUIREMENT

189, 1991 Edition and Appendix VII of the ASME Section XI, 1995 Edition with 1996 Addenda.

ASME Section XI, 1995 Edition with 1996 Addenda requires qualification of ultrasonic examination personnel to CP-

RELIEF REQUESTS/JUSTIFICATION

Demonstration for Ultrasonic Examination Systems) of the ASME Section XI Code. This requires that ultrasonic examination personnel be certified and re-certified in accordance with CP-189 and Appendix VII of ASME Section XI, 1995 Edition with 1996 Addenda. However, CPS is also required to certify and re-certify NDE personnel (other than ultrasonic examination) in accordance with ASNT-TC-1A as identified in 1989 Edition of the ASME Section XI. This would require CPS and/or its contractor to prepare and maintain two (2) different qualification/certification (Written Practice) programs one each for CP-189 and ASNT-TC-1A.

10CFR50.55a requires the use of the 1995 Edition with the 1996 Addenda for Appendix VIII (Performance

There are some differences between ASNT-TC-1A (1989 Edition of Section XI) and CP-189 (1995 Edition with 1996 Addenda of ASME Section XI). However, these differences are not large enough to impact the safety of the plant. Regardless of whether CP-189 or ASNT-TC-1A is used to prepare Written Practices, all UT personnel will be qualified in accordance with ASME Section XI, Appendix VIII and ASME Section XI, Appendix VII. Therefore, CP-189 or ASNT-TC-1A has no impact on capabilities of UT examination personnel.

Relief is requested in accordance with 10CFR50.55a(a)(3)(i) to allow for certifying and re-certifying ultrasonic examination personnel to the 1989 Edition of Section XI.

Certification of ultrasonic examination personnel to the 1989 Edition of Section XI provides an adequate level of quality and safety.

ALTERNATE EXAMINATIONS

prepared per 1989 Edition of ASME Section XI.

Clinton Power Station will certify and re-certify ultrasonic examination personnel in accordance with a written practice

IMPLEMENTATION SCHEDULE

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

Clinton Power Station
ASME Section XI Relief Request
RELIEF REQUEST 4205 (Revision 0)
Examination of Stainless Steel Welds With Corrosion Resistant Cladding

SYSTEM/ COMPONENT(S) FOR WHICH RELIEF IS REQUESTED

Examination Category B-J, austenitic stainless steel welds with Corrosion Resistant Cladding (CRC).

CODE REQUIREMENT

ASME Section XI, 1995 Edition with 1996 Addenda, Appendix VIII, Supplement 2.

RELIEF REQUEST/JUSTIFICATION

Relief is requested in accordance with 10CFR50.55a(a)(3)(i) from Appendix VIII for austenitic stainless steel piping welds

containing CRC. Examination of stainless steel piping welds with CRC is not addressed in Supplement 2 of Appendix VIII of ASME Section XI. At present the Performance Demonstration Initiative (PDI) industry group is working on developing a program for addressing CRC welds. Additional time is required to develop an implementation program as well as to design, fabricate and acquire specimens. Clinton Power Station proposes to utilize equipment and personnel that satisfy the requirements of Supplement 2 and to utilize procedures that use basic calibration blocks. This approach provides reasonable confidence that Intergranular Stress Corrosion Cracking will be detected.

The use of the above method for the examination for defects in stainless steel piping welds with CRC provides an adequate level of quality and safety.

ALTERNATE EXAMINATIONS

Clinton Power Station will examine stainless steel welds with CRC by using equipment and personnel that meet the requirements of Supplement 2 and by using procedures that use basic calibration blocks.

IMPLEMENTATION SCHEDULE

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

Clinton Power Station
ASME Section XI Relief Request
RELIEF REQUEST 4206 (Revision 0)
Change to Annual Personnel Ultrasonic Testing (UT) Training Requirements

SYSTEM/ COMPONENT(S) FOR WHICH RELIEF IS REQUESTED

1995 Edition with 1996 Addenda.

All ASME Code Class 1, 2 components subject to ultrasonic examination in accordance with the ASME Section XI,

CODE REQUIREMENT

personnel.

ASME Section XI, Appendix VII, Subarticle VII-4240 requires a minimum of 10 hours of annual training of NDE

RELIEF REQUESTS/ JUSTIFICATION

Relief is requested in accordance with 10CFR50.55a(a)(3)(i). Additional training is required by 10CFR50.55a(b)(2)(xiv) which states that all personnel qualified for performing ultrasonic examinations shall receive 8 hours of annual hands-on training (on specimens that contain cracks) no earlier than six months prior to performing the examination. Also, ASME Code Case N-583, "Annual Training Alternative, Section XI, Division 1," allows alternative training requirements that are similar to 10CFR50.55a(b)(2)(xiv) requirements. Attending hands-on training that involves examining or analyzing pre-recorded UT data will improve the quality of actual UT examination.

Relief is requested in accordance with 10CFR50.55a(a)(3)(i). Additional training is required by 10CFR50.55a(b)(2)(xiv)

In the proposed rule change for 10 CFR 50.55a (62 FR 63892), the NRC concluded that the requirement of 10 hours of training on an annual basis is inadequate for two reasons. The first reason is that the training does not require laboratory work and examination of flawed specimens. Signals can be difficult to interpret and, as detailed in the regulatory analysis for this rulemaking, experience and studies indicate that the examiner must practice on a frequent basis to maintain the capability for proper interpretation. The second reason is related to the length of training and its frequency. Studies have shown that an examiner's capability begins to diminish within approximately 6 months if skills are not maintained. Thus, the NRC had determined that 10 hours of annual training is not sufficient practice to maintain skills, and that an examiner must practice on a more frequent basis to maintain proper skill level.

The PDI program has adopted a requirement for 8 hours of training, but it is required to be hands-on practice. In addition, the training must take place no earlier than 6 months prior to performing examinations at a licensee's facility. The PDI industry group determined that 8 hours is acceptable relative to an examiner's abilities in this highly specialized skill area because personnel can gain knowledge of new developments, material failure modes, and other pertinent technical topics through other means. Thus, the NRC has decided to adopt in the final Rule the PDI position on this matter. These changes are reflected in 50.55a(b)(2)(xiv).

Eight hours of training six months prior to performing the examination will provide adequate quality and safety.

ALTERNATE EXAMINATIONS

(as identified in 10CFR50.55a(b)(2)(xiv)) in lieu of 10 hours of annual classroom training as required in ASME Section XI, Appendix VII, Subarticle VII-4240.

Clinton Power Station will require 8 hours of hands-on training no earlier than six months prior to performing examinations

IMPLEMENTATION SCHEDULE

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