

March 5, 2012

MEMORANDUM TO: John R. Jolicoeur, Chief  
Licensing Processes Branch  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

FROM: Jonathan G. Rowley, Project Manager /RA/  
Licensing Processes Branch  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF JANUARY 10, 2012, MEETING WITH THE  
PRESSURIZED WATER REACTOR OWNERS GROUP REGARDING  
RELIEF REQUEST FROM THE REQUIREMENTS OF CODE CASE  
N-770-1

On January 10, 2012, a Category 2 public meeting was held between the U.S. Nuclear Regulatory Commission (NRC) staff and representatives of the Pressurized Water Reactor Owners Group (PWROG) at NRC Headquarters, One White Flint North, 11555 Rockville Pike, Rockville, Maryland. The purpose of the meeting was to discuss a draft generic request for relief from the requirements of American Society of Mechanical Engineers (ASME) *Boiler and Pressure Vessel Code* (Code), Section XI, Code Case N-770-1, as imposed with conditions by Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50.55a(g)(6)(ii)(F). The NRC incorporated Code Case N-770-1, by reference, into 10 CFR 50.55a and imposed conditions on the Code Case with regard to inspection coverage requirements for dissimilar metal (DM) welds. The components of interest for this relief request template are the reactor coolant pump (RCP) safe end-to-piping welds in Combustion Engineering design plants. The safe ends for these weld configurations are constructed of cast stainless steel. The examinations discussed were the baseline examinations and the subsequent inservice inspections (ISI).

The meeting began with the PWROG representatives summarizing the background, reason, content, and technical basis for relief. Their presentation and a draft template of a relief request for the NRC staff to review are available in the Agencywide Documents Access and Management System (ADAMS) at Accession Number ML120190403.

The primary discussion topic involved the credit allowed for prior examinations to serve as the baseline for the cold-leg DM welds. The original industry practices for inspection coverage calculation for these regions were provided in the Electric Power Research Institute Materials Reliability Program (MRP) report, titled "Primary System Piping Butt Weld Inspection and Evaluation Guidelines (MRP-139)," which did not require the owner to achieve inspection coverage in non-susceptible materials, such as the cast stainless steel. MRP-139 permitted the owner to perform exams which covered less than 90 percent of the weld length for axial flaws. These inspection coverage practices were continued in Code Case N-770-1, but the conditions applied to Code Case N-770 in 10 CFR 50.55(a) discontinued the allowance. All plants have already completed a baseline examination that either must meet the requirements of 10 CFR 50.55a or be re-performed, unless relief is granted.

Follow-up ISI exams of these locations have different examination requirements imposed by 10 CFR 50.55a than do the baseline exam. The first ISI exams will be scheduled soon, so the PWROG sought clarification of those requirements as well.

The meeting participants discussed example weld configurations and the applicable requirements. The regulation at 10 CFR 50.55a(g)(6)(ii)(F)(3) states that, "Baseline examinations for welds in Code Case N-770-1, Table 1, Inspection Items A-1, A-2, and B, shall be completed by the end of the next refueling outage after January 20, 2012. Previous examinations of these welds can be credited for baseline examinations if they were performed within the re-inspection period for the weld item in Table 1 using Section XI, Appendix VIII requirements and met the Code required examination volume of essentially 100 percent. Other previous examinations that do not meet these requirements can be used to meet the baseline examination requirement, provided NRC approval of alternative inspection requirements in accordance with paragraphs (a)(3)(i) or (a)(3)(ii) of this section is granted prior to the end of the next refueling outage after January 20, 2012."

The PWROG representatives stated that the requirement of Condition (F)(3) was found to be confusing and believe that it would essentially require relief requests for all baseline examinations involving cast stainless steel material. These representatives indicated that they believed that Condition (F)(3) completely replaced paragraph -2500(b) on examination requirements for cast stainless steel items. The NRC staff indicated that this interpretation is incorrect. The NRC staff explained that Condition (F)(3) requires that previous examinations of these welds can be credited for baseline examination if the ferritic piping and the Alloy 82/182 weld were examined with Supplement 10 qualified procedures and the cast stainless steel portion of the weld was examined with Appendix III procedures, per Appendix VIII, VIII-3110(c). Condition (F)(3) requires essentially 100 percent of the Code required examination volume to be inspected. The theoretical beam path into the cast material, from the carbon steel side, can be credited for coverage. Other previous examinations that did not meet these requirements may be used provided NRC approval is obtained within the time limits specified in the Condition.

The requirements for a baseline examination of a weld involving cast stainless steel performed subsequent to the issuance of 50.55a(g)(6)(ii)(F), i.e., not a previous examination (which includes follow-on ISI examinations), can also be satisfied by following the provisions of paragraph -2500(b) of the Code Case. These requirements permit examination of the required volume from the piping side using procedures qualified for single-side examination in accordance with Appendix VIII, Supplement 10. Paragraph -2500(b) requires that 100 percent of the required volume of the susceptible material be examined and that the cast stainless steel material be examined to the extent practical. These are the same requirements that also apply to Table 1 examinations performed after the baseline examination. The NRC staff stated that the theoretical beam path into the cast material from the carbon steel side can be credited for coverage. The NRC staff understands that there currently is no requirement for an Appendix VIII type demonstration for the examination of the cast material and that credit, using Appendix VIII procedures can be used for coverage calculations.

The PWROG representatives discussed the status of ASME activities to develop a code case that will provide a new Supplement 2 to Section XI, Appendix III. This code case will provide prescriptive rules for inspecting cast stainless steel piping items. It is currently in draft form and will be moved up for ASME approval at an upcoming meeting.

The NRC staff indicated that this code case is consistent with its plans to ensure that Code rules on inspection of cast stainless steel are developed and implemented. The NRC plans to approve

this code case, with conditions if necessary and, as a follow on step, advocate and support the development of performance demonstration rules in Appendix VIII, Supplement 9. During the meeting, the participants also discussed Condition (F)(4) which states that, "The axial examination coverage requirements of -2500(c) may not be considered to be satisfied unless essentially 100% coverage is achieved." While industry participants argued that they did not agree with the need for this condition, they indicated that the meaning of this condition was understood by industry.

In the presentation material, the PWROG representatives provided a table with examination coverage for a set of ferritic-to-cast stainless steel Alloy 82/182 welds from the Calvert Cliffs Nuclear Power Plant. The welds listed on this table include the RCP inlet and outlet welds and the cold leg safety injection welds. Industry representatives indicated that all these welds are adjacent to cast stainless steel safe ends. The table provides the ASME Section XI percent coverage for axial and circumferential scans as well as MRP-139 percent coverage for axial and circumferential scans. The MRP-139 percent coverage applies to an examination volume that does not include cast stainless steel material.

The NRC staff participants indicated that the generic relief request and any subsequent plant-specific relief requests should include drawings with scan plots and indicate the percent coverage of the various materials, including the susceptible material, for both the axial and circumferential scan. The scan plots would enable the NRC staff to evaluate the safety significance of any missed coverage.

The draft generic request for relief is written as a hardship without a compensating increase in safety under 10 CFR 50.55a(a)(3)(ii). The NRC staff agrees with this approach. At such time as the ASME Code develops requirements for qualified inspections of cast stainless steel, the hardship cited may no longer exist. That is, at such time as the ASME Code develops requirements for examination of cast stainless steel, depending upon the weld geometry, licensees should be able to increase examination coverage and potentially achieve essentially 100 percent of the required volume.

The NRC staff recommended that licensees send in separate relief requests for baseline and subsequent Table 1 ISI examinations.

The draft relief request was discussed, along with the question of how it would be used. The PWROG representatives did not intend it to be a generic relief request for a large number of plants, which could require extensive NRC review. Instead, the PWROG plans to produce a relief request template which will be used as a framework for plant-specific relief requests to be submitted. The template will be submitted to the NRC staff for their information, but not for their approval by Safety Evaluation (SE). This approach has the benefit of standardizing the majority of the submittals (and thus the SE), making the process easier for both the utilities and the NRC.

After some discussion it was clarified that the NRC would like to receive separate relief requests for baseline credit and ISI credit. This is because the NRC staff is expecting the technology for inspection of cast stainless steel to improve in the near future, and want the industry to take advantage of the improvements. The draft framework for relief which was presented could be used to support both types of requests.

The NRC staff is expecting a large number of relief requests, and is lining up contractors to support the review. The NRC staff stated that they would like to have six months to process each relief request, and also mentioned that plants with less coverage would have more scrutiny. The

PWROG representatives agreed to consider this request. The NRC staff was interested in knowing if there are any sizeable regions which would be missed. There was some discussion of the various areas which form the technical basis for the relief. These would be the resistance to cracking because of the lower temperature, the service experience which leads to a very low probability of cracking, and the high flaw tolerance in the region. The NRC staff suggested that a description of the increased leak detection capability now commonly in use would be helpful.

The PWROG representatives suggested that the NRC staff suggest revisions to Code Case N-770 at the upcoming ASME code meetings. A list of attendees is enclosed.

Project No. 694

Enclosure:  
List of Attendees

cc w/encl: See next page

CONTACT: Jonathan Rowley, NRR/DPR  
301-415-4053

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<b>NAME</b>	JRowley	DBaxley	JJolicoeur	JRowley
<b>DATE</b>	3/2/2012	3/1/2012	3/5/2012	3/5/2012

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Memo to J. Jolicoeur from J. Rowley dated

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REQUIREMENTS OF CODE CASE N-770-1

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**List of Attendees**

**Meeting Regarding Pressurized Water Reactor Owners Group**

**Plan for Relief Request from the Requirements of Code Case N-770-1**

January 10, 2012

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Jonathan Rowley	U. S. Nuclear Regulatory Commission
Robert Hardies	U. S. Nuclear Regulatory Commission
Ali Rezai	U. S. Nuclear Regulatory Commission
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Keith Hoffman	U. S. Nuclear Regulatory Commission
Al Csontos	U. S. Nuclear Regulatory Commission
Jay Collins	U. S. Nuclear Regulatory Commission
Meg Audrain	U. S. Nuclear Regulatory Commission
Dave Rudland	U. S. Nuclear Regulatory Commission
Mathew Kerr	U. S. Nuclear Regulatory Commission
Jay Wallace	U. S. Nuclear Regulatory Commission
Ted Sullivan	Pacific Northwest National Laboratory (NRC Contractor)
Mike Anderson*	Pacific Northwest National Laboratory (NRC Contractor)
Warren Bamford	PWROG/Westinghouse Electric Company
Bernard Rudell	PWROG/Constellation Energy Nuclear Group
Dan Nowakowski	PWROG/Florida Power and Light
Jana Bergman	Sciencetech
Mike McDevitt*	Southern California Edison
Linda Conklin*	Southern California Edison

\*via telephone

ENCLOSURE

PWR Owners Group

Project No. 694

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