

March 21, 2001

Mr. Charles H. Cruse
Vice President - Nuclear Energy
Calvert Cliffs Nuclear Power Plant, Inc.
Calvert Cliffs Nuclear Power Plant
1650 Calvert Cliffs Parkway
Lusby, MD 20657-4702

SUBJECT: CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2 -
REQUEST FOR RELIEF FROM AMERICAN SOCIETY OF MECHANICAL
ENGINEERS BOILER AND PRESSURE VESSEL CODE, SECTION XI
(TAC NOS. MB0390 AND MB0391)

Dear Mr. Cruse:

By letter dated October 27, 2000, Calvert Cliffs Nuclear Power Plant, Inc. submitted a request for relief from certain requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, 1998 Edition, for the third 10-year inservice inspection (ISI) interval of Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2. The licensee requested approval to delay the implementation of certain aspects of the third interval ISI program until October 31, 2002, while preparing an alternative piping ISI program based on a risk-informed approach.

The staff's safety evaluation (SE) which partially authorizes the requested alternative is enclosed. The request was reviewed against the requirements of the 1998 Edition of the ASME Code, Section XI, and 10 CFR 50.55a(a)(3)(ii), and guidelines provided in NRC Information Notice 98-44.

Where authorized, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the third 10-year interval. This SE authorizes a delay of 2 years from July 1, 1999, for conforming to the piping weld examination requirements of the 1998 Edition of the ASME Code, Section XI. This SE does not authorize a delay until October 31, 2002 as requested by the licensee. The staff notes that augmented ISI programs are not covered by this authorization.

The staff acknowledges that the licensee planned to submit its risk-informed (RI) ISI program by November 2000. While a November submittal would have been timely to support completion of the staff's review before the licensee's requested date of June 2001, the new RI-ISI program has not yet been submitted. Should the licensee further delay its submittal, the staff may not have sufficient time to complete its review prior to the expiration of this authorization - at which time, the licensee would be required to meet all Code-required examination.

C.H. Cruse

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The basis for the staff's determination is contained in the enclosed SE. If you should have any questions, please contact the project manager, Donna Skay at 301-415-1322.

Sincerely,

/RA/Peter Tam for

Marsha Gamberoni, Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-317 and 50-318

Enclosure: As stated

cc w/encl: See next page

C.H. Cruse

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*input provided by memo dated 02/14/01;
incorporated with no significant changes

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO THE SECOND 10-YEAR INTERVAL INSERVICE INSPECTION (ISI)
RELIEF REQUEST NO. ISI-15 ON AMERICAN SOCIETY OF MECHANICAL
ENGINEERS BOILER AND PRESSURE VESSEL CODE (ASME CODE), SECTION XI
CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-317 AND 50-318

1.0 INTRODUCTION

Inservice inspection (ISI) of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) Class 1, 2, and 3 components is to be performed in accordance with Section XI of the ASME Code and applicable addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(6)(g)(i). 10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the pre-service examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) twelve months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. For Calvert Cliffs Nuclear Power Plant (CCNPP), Unit Nos. 1 and 2, the applicable edition of Section XI of the ASME Code for the third 10-year ISI interval, which began on July 1, 1999, began with the 1983 Edition, and then changed to the 1998 Edition in January 2001 with NRC approval.

Currently, both units of CCNPP are in the middle of their first period of the third ISI interval. By letter dated October 27, 2000, the licensee, Calvert Cliffs Nuclear Power Plant, Inc. (CCNPPI) stated that it plans to implement in the second period a risk-informed inservice inspection program (RI-ISI) as an alternative to the current ISI program for Class 1 and 2 piping, and

submitted a relief request regarding the requirements of the ASME Code, Section XI. Pursuant to 10 CFR 50.55a(a)(3)(ii), the request seeks relief for meeting the first period minimum percentage of examination required by the ASME Code during the refueling outages (in spring 2000 and spring 2002 for Unit 1, and spring 2001 for Unit 2) of that period. As discussed below, the NRC staff has reviewed and evaluated the licensee's request for relief pursuant to 10 CFR 50.55a(a)(3)(ii).

2.0 EVALUATION

The licensee's request involves examination categories B-F, B-J, C-F-1, and C-F-2 welds pertaining to ASME Code Class 1 and 2 piping. The information provided by the licensee, and the NRC staff's disposition of that information are presented below.

2.1 Code Requirement

In both the 1983 and 1998 Editions of the ASME Code, Section XI requires that, for Class 1 and 2 piping, a minimum percentage of examinations in each category of welds be completed during each successive inspection period and inspection interval in accordance with Program B, Tables IWB-2412-1 and IWC-2412-1, respectively. For the first period of each inspection interval, the minimum examination requirement is 16 percent.

2.2 Licensee's Request for Relief

Pursuant to 10 CFR 50.55a(a)(3)(ii), the licensee requested staff approval, for both units, of a relief from the minimum examination percentages required by the ASME Code, Section XI, for the first period (July 1, 1999 to October 31, 2002) of the third inspection interval (July 1, 1999 to June 30, 2009) for Class 1 and 2 piping Examination Categories B-F, B-J, C-F-1, and C-F-2 welds.

According to the ASME Code, Section XI, Tables IWB-2412-1 and IWC-2412-1, completion of a minimum of 16 percent is required in the first inspection period for each category of weld. For Unit 1, there are two refueling outages (in spring 2000 and spring 2002), and for Unit 2, there is only one refueling outage (in spring 2001) within the first period of the third inspection interval. CCNPPI indicated it would submit its RI-ISI program in November 2000. Based on the intent to develop and implement an alternative ISI program using a risk-informed approach, CCNPPI requested not to perform the examinations needed for meeting the Code required 16 percent during the refueling outage of Unit 2 in spring 2001. CCNPPI also indicated that the same relief request should apply to Unit 1 during its refueling outage in spring 2002 if NRC approval of the RI-ISI program is after June 2001.

2.3 Licensee's Proposed Alternative Examination (as stated)

Calvert Cliffs Nuclear Power Plant is currently developing a Class 1 and 2 risk-informed inservice inspection (RI-ISI) program for both Units 1 and 2. We are using the Electric Power Research Institute (EPRI) Topical Report TR-112657, Revision B-A, "Revised Risk-Informed Inservice Inspection Evaluation Procedure," which was previously approved by the NRC. The RI-ISI program at CCNPP will cover Class 1 and 2 piping

including ASME Examination Category B-F, B-J, C-F-1, and C-F-2 items. We intend to submit our RI-ISI program in November 2000, and anticipate NRC approval by June 2001.

The NRC has issued Information Notice (INFON) 98-044, "Ten-Year Inservice Inspection (ISI) Program Update for Licensees that Intend to Implement Risk-Informed ISI of Piping." The INFON states, in part, "... the staff will consider authorizing a delay up to 2 years in implementation of the next ten-year ISI program for piping only to allow licensees to develop and obtain approval for their RI-ISI program at the next available opportunity using the staff-approved topical reports." The third interval of the ASME Section XI ISI program commenced on July 1, 1999 for Units 1 and 2. Hence, both Units 1 and 2 are currently in the first period (July 1, 1999 through October 31, 2002) of the third interval. Calvert Cliffs is on a two-year refueling cycle; therefore, due to the timing of the third ten-year interval, Unit 2 has one outage (spring 2001) in the first period, and Unit 1 has two outages (spring 2000 and spring 2002) in the first period. In anticipation of the new RI-ISI program implementation, we did not perform any examinations on the Unit 1 Class 1 and 2 piping welds during the 2000 refueling outage. Consequently, implementation of a delay up to two years to allow us time to develop and obtain approval of our RI-ISI program means that both Units 1 and 2 would not meet the minimum examinations completed percentage requirements of ASME Section XI Table IWB-2412-1 and IWC-2412-1 for the first period.

The Calvert Cliffs' RI-ISI program is planned for submittal in November 2000, and we anticipate NRC approval by June 2001. It is our intent to complete 100% of the required RI-ISI program inspections for Class 1 and 2 piping during the remaining periods of the third interval. For Unit 2, this means the RI-ISI program examinations will be performed during the second and third periods. For Unit 1, if the RI-ISI program is approved by June 2001, the normal percentage requirements delineated in Tables IWB-2421-1 and IWC-2421-1 for the first period will be met. However, if the approval is after June 2001, we will perform 100% of the examinations in the second and third periods for Unit 1. Due to the uncertainty of the approval date for the RI-ISI program, we request that the approval of this relief request allows us the flexibility to perform all of the RI-ISI Class 1 and 2 piping examinations during the second and third periods for both Units 1 and 2. All other ASME Section XI Code requirements, augmented examinations, erosion corrosion examinations, inspections required for flaws dispositioned by analysis, system pressure tests, and inspection of components other than piping, will be performed as required.

2.4 Licensee's Basis for Relief Request (as stated)

The proposed relief request has been reviewed by our Plant Operations and Safety Review Committee, and they concluded that compliance with the requirements specified in Paragraphs IWB-2412 and IWC-2412, as delineated in Tables IWB-2412-1 and IWC-2412-1, would result in hardship without a compensatory quality or safety improvement.

Performing the examinations required under the current ASME Section XI rules would result in unnecessary personnel radiation exposure without a compensating increase in

the level of quality and safety. Implementation of RI-ISI programs, in accordance with the NRC-approved EPRI topical report, have been shown to maintain or reduce risk while substantially reducing worker radiation exposure. Risk-informed ISI programs focus inspections and inspection methods on locations potentially susceptible to degradation while considering the consequences of any resulting piping failure. This results in a more robust inspection program.

INFON 98-44 states "... the use of PRA technology in NRC regulatory activities should be increased to the extent supported by the state of the art in PRA methods and data in a manner that compliments the NRC's deterministic approach ... the staff will consider authorizing a delay of up to 2 years in the implementation of the next ten-year ISI program for piping only to allow licensees to develop and obtain approval of their RI-ISI program ..." During the delay period, CCNPP will continue to perform augmented examinations, erosion corrosion examinations, inspections required for flaws dispositioned analysis, system pressure tests, and inspections of components other than piping to ensure an acceptable level of safety is maintained.

Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), CCNPP requests relief from the ASME Section XI Code minimum examinations completed percentage requirements specified in Paragraphs IWB-2412 and IWC-2412 as delineated in Tables IWB-2412-1 and IWC-2412-1 for the first inspection period of our third inspection interval. Calvert Cliffs intends to implement the RI-ISI program during the second and third periods such that 100% of the required RI-ISI examinations are completed by the end of the interval. [...]

2.5 Staff Evaluation

The NRC staff has reviewed the information concerning the ISI program request for relief and the proposed alternative submitted in the licensee's letter dated October 27, 2000, for the first period of the third 10-year ISI interval of CCNPP Unit Nos. 1 and 2, pertaining to Class 1 and 2 piping welds. The ASME Code requires that at least 16 percent in each category of the subject welds be examined during the first period of an inspection interval, which for CCNPP means that the entire 16 percent of welds should be examined in the next (or the only remaining) refueling outage (spring 2002 for Unit 1 due to no examination on Class 1 and 2 piping welds being conducted during the spring 2000 refueling outage, and spring 2001 for Unit 2) of the period.

NRC Information Notice 98-44, "Ten-Year Inservice Inspection (ISI) Program Update for Licensees that Intend to Implement Risk-Informed ISI of Piping" (IN 98-44) states that for licensees that intend to implement a RI-ISI program for piping and follow the guidance provided in IN 98-44, the staff will consider authorizing a delay of up to 2 years in implementation of the ISI program for piping only. In both units of CCNPP, the current ISI program for the third 10-year interval started on July 1, 1999. The planned RI-ISI program is expected to be similar to the RI-ISI programs for those plants using the EPRI risk-informed methodology, such as South Texas, ANO-2, and James FitzPatrick, which were reviewed and approved recently by the staff. Each of those RI-ISI programs use the same methodology which is described in EPRI TR 112657.

The licensee indicated that the first refueling outage in each unit in the first ISI period of the third interval, for which the relief is requested, was spring 2000 in Unit 2 and is spring 2001 in Unit 1. The proposed delay is within the 2-year delay period discussed in IN 98-44 for implementing the alternative program using RI-ISI methodology. The licensee further indicated that the RI-ISI program for Calvert Cliffs was to have been submitted in November 2000 and that implementation of the RI-ISI will be completed by the end of the third ISI interval (June 30, 2009). This proposed alternative excludes augmented examinations and system pressure tests, and inspection of components other than piping are unaffected by this request for relief. This is in conformance with the guidance of IN 98-44, which indicates that the performance of augmented examinations would be unaffected by staff approved delays in updating ISI programs to accommodate development of RI-ISI programs.

The RI-ISI program that will be developed should result in a substantial reduction in the required number of piping weld examinations. Examination of this reduced number of piping weld examinations will be spread over the remaining outages in the interval that began on July 1, 1999. Deferral of the non-augmented examinations scheduled to be conducted in the first refueling outage for each unit in the third interval should not have an impact on the licensee's ability to complete the examinations determined to be necessary based on the RI-ISI methodology. Furthermore, the RI-ISI program developed by the licensee will be reviewed by the NRC and will require NRC authorization prior to implementation. On these bases, the staff has determined that the licensee's proposed alternative for each unit's first refueling outage in the first period of the third ISI interval provides an acceptable level of quality and safety and is, therefore, authorized pursuant to 10 CFR 50.55a(a)(3)(i). However, delay through the second refueling outage in Unit 1, which starts in spring 2002, is beyond the 2-year delay period stated in IN 98-44, and is not authorized in this relief request.

3.0 CONCLUSION

Based on information provided in the licensee's request for relief and the target date to submit the alternative RI-ISI program, the staff has determined that relief from performing Class 1 and 2 piping weld examinations during the first refueling outage for each unit in the third interval, as required by the ASME Code to meet the minimum percentage of examination, is acceptable. Therefore, this aspect of Relief Request RR-RI-ISI-1 is authorized pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that the request provides an acceptable level of quality and safety. This safety evaluation authorizes a delay of 2 years from July 1, 1999, for conforming to the piping weld examination requirements of the applicable Edition of the ASME Code, Section XI, for the third 10-year ISI interval at CCNPP, Unit Nos. 1 and 2. This authorization does not extend to October 31, 2002, to encompass the spring 2002 Unit 1 outage. This authorization does not apply to any augmented examination requirements.

Principal Contributor: S. Hou

Date: March 21, 2001