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September 30, 2005

U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318
Request for Approval of ASME Section XI Code Case N-516-2 for Underwater Welding of Heated Junction Thermocouple Probe Holders

Pursuant to 10 CFR 50.55a(a)(3)(i), Calvert Cliffs Nuclear Power Plant, Inc. (CCNPP) hereby requests Nuclear Regulatory Commission approval of American Society of Mechanical Engineers Section XI Code Case N-516-2, "Underwater Welding," for use at CCNPP. Code Case N-516-2 has been conditionally accepted by the Nuclear Regulatory Commission in Regulatory Guide 1.147, Revision 13. The details of the 10 CFR 50.55a request are attached. The requirements of Nuclear Regulatory Commission approved Code Case N-516-2, as described in this request, provide an acceptable level of quality and safety.

Calvert Cliffs Nuclear Power Plant requests approval by February 6, 2006, based upon the schedule for replacement of the Unit 1 reactor pressure vessel head during the Unit 1 2006 refueling outage. The attached relief request is for approval of a specific application of the Code Case (for both Unit 1 and Unit 2) rather than for approval for generic use.

If there are any questions regarding this request, please contact Mr. L. S. Larragoite at (410) 495-4922.

Very truly yours,

GV/MJY/bjd

Attachment: (1) Relief Request for Approval of ASME Boiler and Pressure Vessel Code, Section XI Code Case N-516-2 for Underwater Welding of Heated Junction Thermocouple Probe Holders

cc: P. D. Milano, NRC
S. J. Collins, NRC
Resident Inspector, NRC
R. I. McLean, DNR

AC47

ATTACHMENT (1)

RELIEF REQUEST FOR APPROVAL OF ASME BOILER AND PRESSURE VESSEL CODE, SECTION XI CODE CASE N-516-2 FOR UNDERWATER WELDING OF HEATED JUNCTION THERMOCOUPLE PROBE HOLDERS

Calvert Cliffs Nuclear Power Plant, Inc.
September 30, 2005

ATTACHMENT (1)

RELIEF REQUEST FOR APPROVAL OF ASME BOILER AND PRESSURE VESSEL CODE, SECTION XI CODE CASE N-516-2 FOR UNDERWATER WELDING OF HEATED JUNCTION THERMOCOUPLE PROBE HOLDERS

BACKGROUND:

As part of the reactor pressure vessel head and incore instrumentation plate replacement at Calvert Cliffs Nuclear Power Plant (CCNPP), the heated junction thermocouple (HJTC) probes used for the Reactor Vessel Level Monitoring System will be relocated from modified control element drive mechanisms to incore instrumentation nozzles. This modification installs a new HJTC probe holder which will house the HJTC probe. The probe holder consists of a funnel and tube which are of Type 304 austenitic stainless steel.

To support the new probe holder, intermittent fillet welds will be made underwater with the shielded metal arc welding process joining new funnels and support brackets for the probe holders (two per Unit) to the existing upper guide structure (UGS). The UGS consists of the UGS plate, the control element assembly (CEA) shrouds, and the fuel alignment plate (FAP). The new funnel at the top end of the probe holder will be fillet welded to the existing UGS plate. This funnel will assist in the assembly and support the tube at the upper location and is a guide for inserting the HJTC probes into the probe holders. The probe holders will also be welded to the CEA shrouds. The weld locations are depicted in Figure 1.

The UGS is inspected in accordance with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (B&PV), Section XI, as a "core support structure." The modification to install the HJTC probe holder assemblies in the UGS will be performed in accordance with the requirements of the ASME B&PV, Section XI. However, the HJTC probe holder assembly, which consists of the probe holder, funnel, and brackets, does not provide the function of a "core support structure." The UGS performs a "core support structure" function. The attachment welds, joining the probe holder assemblies to the UGS, are performed in accordance with ASME B&PV, Section XI requirements. This welding is covered by ASME Section XI Code Case N-516-2. The Nuclear Regulatory Commission (NRC) requires the licensees to obtain approval prior to using Code case N-516-2, in accordance with 10 CFR 50.55(a)(3) regarding the technique to be used in weld repair or replacement of irradiated material underwater.

ATTACHMENT (1)

RELIEF REQUEST FOR APPROVAL OF ASME BOILER AND PRESSURE VESSEL CODE, SECTION XI CODE CASE N-516-2 FOR UNDERWATER WELDING OF HEATED JUNCTION THERMOCOUPLE PROBE HOLDERS

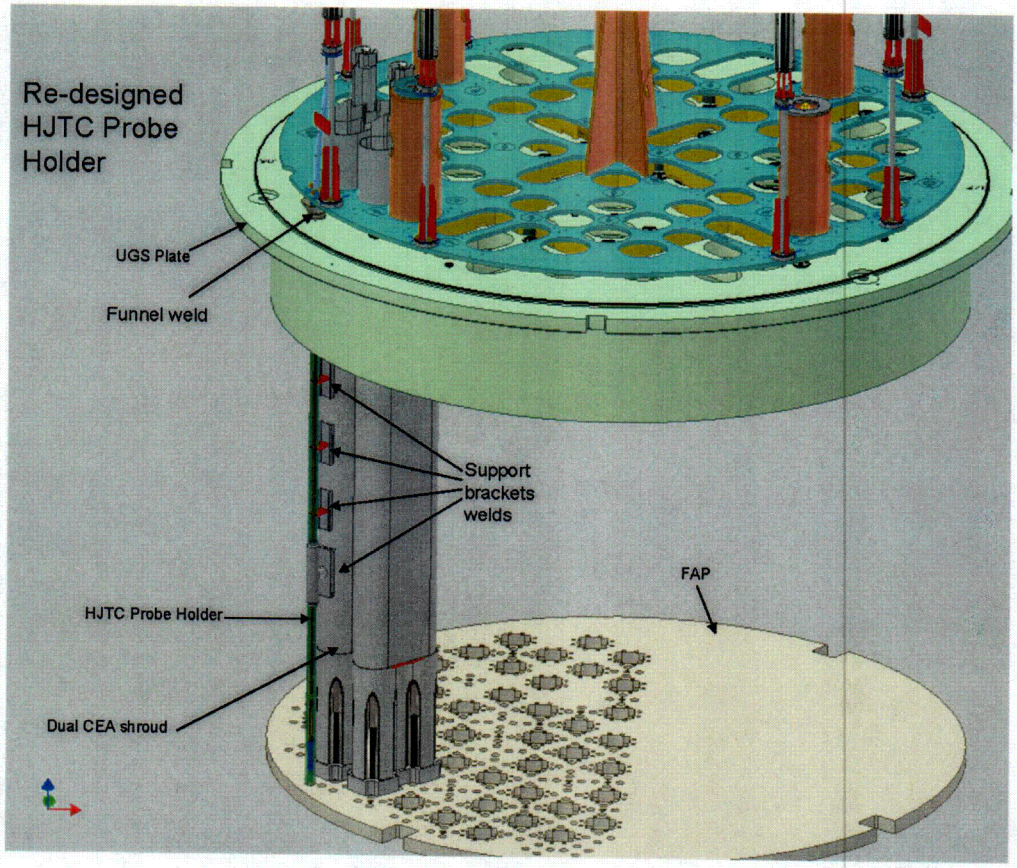

FIGURE 1

Note: All references to ASME B&PV, Section XI, are to the 1998 Edition, no Addenda. All references to ASME B&PV, Section III, are to the 1998 Edition through the 2000 Addenda. All base materials are austenitic stainless steel and the welds will be austenitic stainless steel. The lowest weld is 42 inches above the FAP.

COMPONENT FOR WHICH RELIEF IS REQUESTED:

Relief is requested as required in Regulatory Guide 1.147, Revision 13 to allow the use of Code Case N-516-2 at Calvert Cliffs for underwater welding on the Unit 1 and Unit 2 UGS at locations where the HJTC probe holder will be installed. These components have been irradiated as a result of their location in the reactor vessel and meet the definition of an irradiated component. Per Regulatory Guide 1.147, Revision 13, licensees must obtain NRC approval in accordance with 10 CFR 50.55(a)(3) regarding the technique to be used in the weld repair or replacement of irradiated material underwater.

The Unit 1 and 2 UGS were formed from austenitic stainless steel. The HJTC probe holder brackets are SA-479 Type 304 austenitic stainless steel. The funnels are SA-479 austenitic stainless steel or SA-240 Type 304 austenitic stainless steel. The filler metal is austenitic stainless steel meeting the requirements

of SFA 5.4. The production filler metal will meet all applicable filler metal certification requirements of paragraph 4.0 of Code Case N-516-2, with results provided to the NRC, if desired. The minimum ferrite number is FN 5.

CODE REQUIREMENTS FOR WHICH RELIEF IS REQUESTED:

The current Code of Record, ASME B&PV, Section XI, 1998 Edition, no Addenda, does not allow underwater welding of irradiated components. Permission is requested to use Code Case N-516-2, "Underwater Welding," Section XI, Division 1. As required by Regulatory Guide 1.147, Revision 13, we are requesting NRC approval of the technique (shielded metal arc welding process) to be used in the weld repair or replacement of irradiated material underwater.

REASON FOR THE REQUEST:

Approval for the use of Code Case N-516-2 is requested for underwater fillet welding of HJTC probe holders to the UGS. This consists of welding the probe holder brackets to two CEA shrouds, located on the periphery of the UGS, and two funnels to the top of the UGS plate. Relocation of the HJTC probe holders to the UGS is required to support the reactor vessel closure head replacement. Underwater welding of the specified components is necessary due to radiological conditions and the need to maintain individual exposure to ionizing radiation as low as reasonably achievable.

PROPOSED ALTERNATIVE AND SUPPORTING INFORMATION:

The NRC documented their conditional acceptance of Code Case N-516-2 in Regulatory Guide 1.147, Revision 13, January 2004. The specific condition noted in Regulatory Guide 1.147, Revision 13, requires licensees to obtain NRC approval in accordance with 10 CFR 50.55a(3) regarding the technique to be used in the weld repair or replacement of irradiated material underwater.

Calvert Cliffs requests NRC approval of ASME Section XI Code Case N-516-2 for use at CCNPP on the basis that it provides an acceptable level of quality and safety.

Approval is requested for the use of Code Case N-516-2 in order to relocate two (per Unit) HJTC probe holder assemblies to the UGS. The specific application is for wet underwater welding. These welds will be made using a weld procedure specification qualified in accordance with Code Case N-516-2 and the welds will be visually examined. The weld procedure specification has been qualified with tensile and bend tests in accordance with ASME B&PV, Section IX, and the additional requirements of Code Case N-516-2. The filler material will be qualified with chemical, ferrite, and tensile tests performed in accordance with Code Case N-516-2. To support the new probe holder, intermittent fillet welds will be made underwater with the shielded metal arc welding process joining new funnels and support brackets for the probe holders (two per Unit) to the existing UGS.

Mockup testing for welders will be used. The mockup testing will be performed using similar materials and under similar conditions as the production welds. These welds will be subjected to the same inspection requirements as the production welds.

The subject fillet welds are to relocate the HJTC probe holders to the UGS. They are not structural welds performing a core support structure function, nor are they pressure boundary welds. The requirements imposed on the welds are conservative with respect to the safety function of the welds. If required, the

CEA shrouds and UGS plate will be prepared for welding by removal of the non-tightly adherent oxide layer.

Welding will occur after 23 effective full power years of operation with a calculated thermal fluence at 42 inches above the FAP $< 5E16$ n/cm^2. The water depth of the lowest weld, which is located at 42 inches above the FAP, will be approximately 25 feet. The qualification depth rules of Code Case N-516-2 will be met. These additional requirements, combined with the alternative requirements of Code Case N-516-2, provide an acceptable level of quality and safety for underwater welding.

Non-destructive examination will be by visual examination only, per Code Case N-516-2, by a certified examiner. Ongoing examinations will fall under the normal In-service Inspection intervals, per ASME B&PV, Section XI.

This relief request will be implemented during the next refueling outages for each Unit and will remain in place for the life of the plant.

CONCLUSION:

Calvert Cliffs Nuclear Power Plant believes the requirements of the NRC approved Code Case N-516-2, as described in this request, provides an acceptable level of quality and safety and requests NRC approval no later than February 6, 2006.