

ATTACHMENT (1)

**SUMMARY OF CALVERT CLIFFS UNIT 2 DEVIATION FROM MRP-139
REQUIREMENTS**

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Calvert Cliffs Nuclear Power Plant (Calvert Cliffs) is taking a deviation from the MRP-139 (Reference 1) requirement to perform ultrasonic examination of all Alloy 82/182 butt welds that are exposed to temperatures equivalent to the Reactor Coolant System cold leg temperature by December 31, 2010. The deviation is specifically applicable to eight 30-inch Alloy 82/182 welds at Calvert Cliffs Unit 2 only. These welds are located in the Reactor Coolant System cold legs and this deviation would allow an examination delay from December 31, 2010 to the 2011 refueling outage (currently scheduled to begin in February 2011).

Calvert Cliffs approval of the deviation to defer volumetric examination of the subject CCNPP Unit 2 welds by approximately two months was based on the following considerations and actions to be taken in lieu of the MRP-139 schedule:

1. Calvert Cliffs will, as a minimum, perform bare metal visual (BMV) examinations and gather ultrasonic testing (UT) planning information in the 2009 refueling outage for all eight welds. Pressurized Water Reactor Owners Group studies and our independent results show that the large acceptable flaw tolerance, low crack growth rate, and large critical crack size of these welds gives the BMV high safety credibility for an additional cycle of operation.
2. Improved examinations are achievable in the 2011 refueling outage, versus the 2009 refueling outage, because more detailed pre-examination information will be gathered on weld profiles and detailed inspectability reviews will be conducted following the BMV examinations and measurements that will be performed in spring 2009 refueling outage.
3. The UT examinations will entail less radiation exposure in the 2011 refueling outage versus the 2009 refueling outage as a result of the zinc injection chemistry that has recently started on Unit 2. The chemistry change is expected to reduce the radioactivity in the Reactor Coolant System during refueling outages.
4. Additional Pressurized Water Reactor Owners Group work is scheduled to be completed in the fall of 2009 and is expected to further characterize the flaw tolerance and acceptance of limited examination coverage projected by contours and geometric configurations.
5. Calvert Cliffs has completed volumetric examinations of all other cold leg temperature dissimilar metal welds, greater than one inch in size, on Unit 2 (and many on Unit 1) with no indications of primary water stress corrosion cracking (PWSCC) detected.
6. Calvert Cliffs performed best effort UT on two Unit 1 reactor coolant pump welds in the 2006 refueling outage and found no PWSCC.
7. The welds have low susceptibility to PWSCC and are not subject to any other known degradation mechanisms, such as fatigue due to thermal stratification.

Nuclear Energy Institute-03-08 Addendum E (Reference 2) requires that technical justifications for deviations from mandatory and needed work product elements must provide the basis for determining that the proposed deviation meets the same objective and intent or level of conservatism exhibited by the original work product.

Calvert Cliffs concludes that the proposed deviation meets the same level of conservatism exhibited by the original work product and that deferral of volumetric examinations for two months beyond the required December 31, 2010 is technically acceptable because:

- The duration of the deviation requested is short (two months). All eight welds will be volumetrically examined during the spring 2011 refueling outage. Predicted crack growth during that two month time frame is not significant.

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- The reactor coolant pump inlet and outlet welds have the longest predicted time to through-wall cracking and the largest margin between leakage and failure of any of the Calvert Cliffs Alloy 82/182 dissimilar metal welds.
- A review of the safety analysis methods and conclusions was performed considering the advanced finite element methodology employed by the industry to evaluate pressurizer welds with indications similar to those found at Wolf Creek. The review was supplemented by additional plant specific residual stress and crack growth analysis for Calvert Cliffs Unit 2. This review concluded that the conclusions of MRP-216 (Reference 3) with respect to margins to leak versus break for welds with partial-arc inner diameter repairs are directly applicable to the subject welds at Calvert Cliffs Unit 2.
- Calvert Cliffs and industry experience indicates a low incidence of PWSCC in cold leg Alloy 82/182 welds. The welds have a relatively low susceptibility to PWSCC.
- All Calvert Cliffs Unit 2 Alloy 82/182 butt welds will have been BMV examined by the conclusion of the 2009 refueling outage and all but these eight butt welds have been UT examined providing a substantial experience base.
- Calvert Cliffs has implemented more stringent procedures for detection of unidentified leakage as required by industry guidance.

References

1. Material Reliability Program: Primary System Piping Butt Weld Inspection and Evaluation Guideline (MRP-139); EPRI Product Number 1010087, Final Report, July 14, 2005
2. Addendum E, Materials Guidelines Implementation Protocol, to NEI 03-08 [Addenda], Materials Initiative Guidance, Revision 3, June 2008
3. Materials Reliability Program: Advanced FEA Evaluation of Growth of Postulated Circumferential PWSCC Flaws in Pressurizer Nozzle Dissimilar Metal Welds (MRP-216, Revision 1) Evaluations Specific to Nine Subject Plants, EPRI Product Number 1015400, Final Report, August 2007