May 19, 2000

Mr. Eliot Protsch
President
IES Utilities Inc.
200 First Street, SE
P.O. Box 351
Cedar Rapids, IA 52406-0351

SUBJECT: DUANE ARNOLD ENERGY CENTER - FLAW EVALUATION OF A SUBSURFACE FLAW IN RECIRCULATION RISER NOZZLE-TO-SAFE END WELDS (TAC NO. MA8663)

By letter dated February 7, 2000, the IES Utilities Inc. (the licensee) submitted, among other requests, a flaw evaluation for a subsurface flaw detected in recirculation riser nozzle-to-safe end welds at the Duane Arnold Energy Center during Refueling Outage (RFO) 16. Two other flaw indications that were identified during the same outage have been repaired using weld overlays. This letter concerns the Nuclear Regulatory Commission (NRC) staff evaluation of the licensee's flaw evaluation of the detected subsurface flaw only. Requests for reliefs MC-R008 and NDE-R28, Revision 1, submitted on February 7, 2000, will be addressed in a separate correspondence.

The NRC staff has reviewed the licensee's flaw evaluation. The licensee used Table IWB-3641-1 of Section XI of the American Society of Mechanical Engineers (ASME) Code and determined that the allowable crack depth is 0.72 inch. The licensee also calculated the fatigue crack growth to the end of license using Appendix C (Section XI) curve and Appendix A (Section XI) stress intensity factor (K) formulas and concluded the fatigue growth is negligible. Because the detected flaw depth of 0.3 inch is less than the allowable crack depth of 0.72 inch, the licensee concluded that the Unit could be operated with the subsurface flaw in the recirculation riser nozzle-to-safe end weld.

Based on this evaluation, the NRC staff has determined that the licensee's evaluation is in accordance with the ASME Code and the NRC staff agrees with the licensee's conclusion. Although the licensee applied an approximate approach to the Appendix A equations by adding the bending stresses to the membrane stresses and eliminating the term due to bending stresses in the K calculation, the NRC staff confirmed that this approach is bounding. Hence, the flaw evaluation satisfies Section XI requirements on flawed components.

If you have any questions regarding this issue, please contact me at your earliest convenience at 301-415-2020.

Sincerely,

/RA/

Brenda L. Mozafari, Project Manager, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-331

cc: See next page

If you have any questions regarding this issue, please contact me at your earliest convenience at 301-415-2020.

Sincerely,

/RA/

Brenda L. Mozafari, Project Manager, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-331

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Duane Arnold Energy Center

cc:

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