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U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555

Subject: Information on Ultrasonic Flow Measurement Instrumentation

Gentlemen:

The change to 10CFR50, Appendix K proposed by the NRC would provide a regulatory mechanism for licensees to increase plant power based on a justification for reduced power measurement uncertainty. The most significant reduction in uncertainty can be obtained through improved flow measurement technology. At the present time, several alternative technologies are being used in the nuclear power industry for the measurement of feedwater flow. Some of them utilize ultrasonics but the various ultrasonic technologies differ substantially in their operating principles and sensitivities. Conceptually, any of the ultrasonic technologies might be proposed for use under the amendment to the rule.

Caldon applauds the NRC's efforts in this area and is certain that they will result in increased power production, without reduced safety, for nuclear facilities properly utilizing ultrasonic technology.

Since acquiring the LEFM Flow Measurement technology from Westinghouse in 1989, Caldor has made a significant investment in improving this technology and also in developing application know-how. This has been in support of our objective to be a supplier of high quality flow measurement instrumentation and services. As part of our on-going R&D program, we conduct analyses and experiments on the performance of our products and we monitor and evaluate their long-term performance at actual installations. We document the results of these efforts. We also evaluate alternative technologies and keep abreast of new developments. Consequently, we believe we have developed a good understanding of various flow measurement technologies, particularly those using ultrasonics, and the specific uncertainties inherent in them.

Enclosed with this letter is information that Caldor is providing to the NRC on ultrasonic flowmeters of three different types: a) *chordal transit-time flowmeters*, the type that Caldor offers in the LEFM✓, which is the type installed at Comanche Peak, b) *externally mounted transit-time flowmeters*, another type offered by Caldor and now used by a number of plants under the current 1.02 margin of Appendix K, and c) *cross*

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*correlation flowmeters*, the type currently being reviewed by the NRC technical staff. Certain of this information has been developed by Caldon. Other information included has been published by independent experts.

Based on our own analyses, and a review of information developed by others, Caldon is concerned that instruments measuring flow by means of cross correlating ultrasonic signals affected by eddies in the flow stream may not support a significant reduction in the 2-percent power margin of Appendix K. The measurement uncertainty of instruments of this type is subject to some of the same influences that affect externally mounted transit-time flowmeters. As Caldon is a supplier of externally mounted transit-time flowmeters, we have experience in analyzing and bounding these influences. Given that instrumentation of the cross correlation type currently is being reviewed by the NRC technical staff and given the importance that all uncertainties be fully accounted for and bounded, Caldon is providing the enclosed information to contribute to understanding the sources of uncertainty and the potential magnitude of their impact.

We hope that the enclosed information proves to be useful to the NRC technical staff in their ongoing review effort. Caldon would be happy to provide clarification or additional information if desired by the staff and to meet with them if they should decide a meeting would be helpful.

Please contact Jennifer Regan at 610-274-8256 or me at 412-341-9920 with any questions you may have.

Respectfully yours,



Calvin R. Hastings  
President & CEO

CRH/ta

Enclosure

cc: Mr. Jared Wermeil  
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