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October 26, 1984

Dr. C. Y. Cheng
Nuclear Regulatory Commission
Mail Stop P328
Washington, D.C. 20555

Dear Dr. Cheng:

Previously presented reports document the observations and conclusions of the Southwest Research Institute (SwRI) consultants regarding the initial meeting on the Indian Point vessel flaw and the meeting at Westinghouse to review the additional work performed to demonstrate the basis for the reduced flaw size estimate. We wish to present in this letter our observations and conclusions regarding our review of the Consolidated Edison (Con Ed) submittal of September 21, 1984 and the meeting of October 3, 1984, on the same subject.

Based on our review of the Con Ed submittal and with consideration of our observations of the Westinghouse demonstrations, we believe that the flaw size estimates of 0.26 inches deep by 0.85 inches long are not conservative. The statement that flaw length was exaggerated by a constant of 1.109 inches is not entirely credible because it includes the exaggeration observed on notches of greatly different ultrasonic response. If the notch which is closest to the postulated flaw size, and, which produces ultrasonic response similar to the vessel flaw, is independently considered a length exaggeration of 0.789 inches is noted. Applying this correction to the Code derived flaw size, one derives a corrected flaw length of 1.1 inch. We cannot be certain that the true length is precisely 1.1 inches, but we believe that 1.1 inch is a more qualified estimate and closer to the true length.

Similarly we believe that the flaw depth estimate of 0.26 inch is not conservative. When one considers that the 60 degree data of the 0.3 inch and 0.5 inch deep notches using Code sizing techniques exaggerates the depth by a factor 2x to 3x, the exaggeration factor of 6x applied to the vessel flaw to obtain the depth estimate of 0.26 inches appears inappropriate. Additionally, the 1.5 inch deep notch was exaggerated only by a factor of 1x to 1.5x. These data points independently suggest that the flaw could be approximately .5 inches deep.

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The pitch catch data does not clearly demonstrate that the flaw is only 0.26 inches deep. In fact this data does not conclusively prove that the flaw is necessarily much less than 1.0 inch in depth. This is not to suggest that the flaw is 1.0 inch deep, but to show that this data does not support the flaw depth estimate of 0.26 inches.

We agree that the time of flight data suggests a flaw depth of 0.3 inches but this is a single data point and there is a distinct possibility that the observed tip signal is eminating from a portion of the flaw other than the deepest point. The demonstration of this technique on a notch verifies a well established ultrasonic principal, but the flaw likely does not have the same type of uniform edge as the machined notch and, therefore, there is no assurance that this examination is detecting the deepest point of the flaw.

During the October 3, 1984 meeting, essentially the same data as contained in the written submittal was presented and discussed. While some points were clarified, no additional data was presented to change the conclusions delineated above. Therefore, it is our opinion that estimated flaw size of 0.85 inches long by 0.26 inches deep is not conservative and that the flaw is likely to be somewhat larger. We are confident that the flaw is smaller than the 2 inches long by 1.2 inches deep estimates originally presented.

There are several other nondestructive examination techniques which could be applied to this flaw to give more accurate measurements of its true size. Some of the available techniques are not routinely utilized in a power plant environment and some require special adaptation to a particular examination problem. However, given appropriate consideration and early planning, a flaw such as this can be characterized and sized with much more accuracy than has been accomplished so far. We suggest you consider the potential benefits to be derived from requiring reexamination of this flaw utilizing advanced techniques.

It has been a pleasure working with you on this problem. If we can be of anyt further assistance, please call at any time.

Very truly yours,

Wayne T. Flach

Wayne T. Flach
Director