

OAK RIDGE NATIONAL LABORATORY

OPERATED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.

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October 8, 1984

Mr. L. Frank
Materials Engineering Branch
Mail Stop P-328
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Frank:

Subject: Travel to Bethesda, October 2-3, 1984, to Participate in Meetings Concerning the Review of the Consolidated Edison Report on the Investigation of an Ultrasonic Indication in the Indian Point Unit 2 Reactor Pressure Vessel (Docket 50-247)

I reviewed the information contained in this report in detail at ORNL and discussed my observations with C. Y. Cheng and John Gieske by telephone. Further, John Gieske and I compared notes and observations (on the evening of October 2) dealing with this report and our observations of the mockup demonstration performed by Westinghouse on curved test block IPP-1T on August 17, 1984. We were both in Bethesda (at your request) for the October 3 meeting called by the NRC. Although we discussed many of the details in the Consolidated Edison September 21 report, our main conclusion was that the data presented had not been fully utilized to establish the error bars (i.e., sufficient conservatism had not been used) on the depth and length numbers reported (i.e., the 0.26- by 0.85-in. depth times length of the reactor pressure vessel indication). We discussed the questions that needed answers from the meeting the next day. Questions for which we wanted specific answers were discussed and included the following items:

1. Exact use of Table 1-C statistics.
2. Interpretation of the preceding peak time statement for the delta-measured tip and root signal on the reactor pressure vessel indication (to confirm that the peak times were 131 and 132.8 μ s).
3. A real possibility of a buttress notch being in the vessel.
4. Origin of the 0.26-in. depth number.
5. Had an attempt been made to use the 30- μ s delayed satellite pulse observed with the reactor pressure vessel indication?

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On Wednesday morning, October 3, we met with C. Y. Cheng, Jack Durr, and Harry Kerch on the third floor of the Phillips Building. Jack and Harry are NRC Region I personnel. Around 9:00 a.m., we were joined by Warren Hazelton, Martin Hum, Bill Clayton, and Wayne Flach. We discussed the data presented by O'Toole and agreed that the 1.2- by 1.96-in. size of the reactor pressure vessel indication (measured by code) probably bounded the indication. We also agreed that the reduced size measured by augmented techniques was probably not conservative enough due to measurement variations that were evident in the report.

W. Johnston held a meeting prior to the official review in his office with all who attended the morning session, along with S. Varga, B. Elliot, and possibly one or two more NRC people. Varga and Johnston outlined the approach to be taken in the afternoon session based on Cheng's summary of the morning activities and appropriate discussions that ensued.

Shortly after 1:00 p.m., the official review of the Indian Point Unit 2 report was convened on the fourth floor of the Phillips Building (Room P422). Prime participants in this meeting were S. Varga, D. Johnston, J. O'Toole, Don Adamonis, Warren Beamford, and John Fox. However, many people asked questions and the information presented was very informative. After hearing comments and discussion from Consolidated Edison, Westinghouse, and Combustion Engineering personnel and receiving answers from them on a number of questions, we caucused in a separate meeting room on the fourth floor. We discussed the way the statistics had been generated (in particular, that the 0.26-in. depth amplitude number was based on four points, with one of these a questionable data point) and the possible errors in the calculated number (the depth is subject to a plus-or-minus measurement error as noted by the large standard deviation). We discussed the two delta methods used and observed that, according to a statement in their report, the 0.18-in.-deep measurement was subject to a ± 0.15 -in. variation and that the 0.24-in.-deep measurement was subject to a ± 0.2 -in. variation. Thus, we concluded that the reported 0.26-in. depth was not conservative since all three methods provide values that may exceed 0.3-in. We discussed the reported length (0.85 in.) and concluded again that it was not conservative because ideal reflectors (those with very high ultrasonic reflectivity) with nonflaw shapes (square notches with abrupt full depth steps on each end, as opposed to the gradual depth increase and decrease predicted at the ends of a natural or code-type indication) would be expected to size different with ultrasonic amplitude measurements. We also discussed the fact that they could not substantiate the existence of a buttress notch and had not used the satellite pulse. The NRC decided to ask for three pieces of information: (1) documented fracture mechanics and probability results, (2) delta information detail, and (3) a sketch documenting the physical location of the reactor pressure vessel indication based on the latest data.

Around 4:30 p.m., we returned to P422, where S. Varga asked for these three pieces of information (O'Toole agreed to supply them) and informed O'Toole that startup could begin, based on the flaw being bounded by the

1.2- by 1.96-in. size and the successful conclusion of the NRC fracture analysis (i.e., agreement with Westinghouse). Vargas also informed O'Toole of the probable requirement for augmented inspections (more than one in ten years). Consolidated Edison asked for permission to perform some tests at elevated temperature with a pressurized vessel. Varga asked for a written request and promised full speed ahead on this request as well as the fracture mechanics analysis so that startup could be as soon as possible. Adjournment was around 4:45 p.m.

Sincerely yours,



Kenneth Von Cook
Nondestructive Testing Group
Metals and Ceramics Division

KVC:jlb

cc: C. Y. Cheng, NRC ✓
R. W. McClung
G. M. Slaughter
J. H. Smith
K. V. Cook/File