ENCLOSURE

MILLSTONE NUCLEAR POWER STATION, UNIT 3

NORTHEAST NUCLEAR ENERGY COMPANY

DOCKET NO. 50-423

SAFETY EVALUATION REPORT

FEEDWATER VENTURI INSPECTION PORTS

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In response to our questions, the Northeast Nuclear Energy Company (NNECO), in a letter from J. F. Opeka to B. J. Youngblood, NRC, dated September 19, 1984, described how the feedwater venturis will be visually inspected for crud buildup before the startup of each cycle via inspection ports. NNECO stated that the feedwater flow venturis will be cleaned by hydrolasing as deemed necessary after the inspections. NNECO also committed to install inspection ports upstream and downstream of the venturis during the first refueling outage. However, in a letter from J. F. Opeka, NNECO, to V. S. Noonan, NRC, dated October 27, 1986, the licensee requested a change from two inspection ports originally proposed to one port, based on an engineering evaluation. A written concurrence from NRC was requested regarding the acceptance of one inspection port upstream of the venturi as adequate for inspection and cleaning. The following was presented:

(1) The feedwater venturis installed at Millstone Unit No. 3 are identical to the feedwater venturis installed at the Calvert Cliffs nuclear units and Millstone Unit No. 2. The Calvert Cliffs nuclear units and Millstone Unit No. 2 have one inspection port located upstream of each feedwater venturi and have not experienced any problems with the inspection and cleaning of the venturis.

(2) The design and location of the inspection port at Millstone Unit No. 3 will be consistent with that used for the Calvert Cliffs nuclear units and Millstone Unit No. 2. The inspection port will be located about 13 inches upstream of the low pressure tap of the venturi tube. This places the inspection port about midway between the low pressure and high pressure taps. With a 4-3/4" diameter opening of the inspection port, the observer would have an unobstructed view of the inside pipe wall opposite the port

and would readily see the inlet contour of the venturi along the opposite wall. Using an inspection mirror and light, the entire circumference of the inside pipe wall can be viewed as well as the converging section of the venturi. A flexible fiber-scope would be used for closer inspection and for viewing the divergent section of the venturi. If venturi fouling is discovered during inspection, venturis will be cleaned by hydrolasing.

We requested further information, including a drawing of the proposed venturi meter installation which shows the inspection port. Also, information was requested regarding the effect of the inspection port opening on the accuracy of the reading because of possible turbulence. The licensee provided the requested drawing and also ASME Paper 83-JPGC-PTC-3, "Retrofitting a Flow-Section Inspection Port," which described the Calvert Cliffs installation.

The licensee stated that the venturi inspection port installation at the Calvert Cliffs plant was similar to the one proposed for Millstone Unit 3. The information provided by the ASME paper indicates that the venturi manufacturer had developed the inspection port design. The port is shown to have a contour fit plug in the piping that eliminates a cavity that would cause turbulence and effect the flow measurement pressure drop reading. In the venturi cleaning operation at Calvert Cliffs using high velocity water, it was reported that a deep rust red color of the water appeared to clear considerably after the initial 5 minutes of wash. The deposit was judged to be 5 mils thick. The experience gained at the Calvert Cliffs plant for this design indicates that the single inspection port design is successfully used to effectively inspect and clean the venturi meter. Based on this information we find the single port design to be acceptable for use at the Millstone Unit 3 plant.

It is noted that the licensee has indicated that they plan to remove the RTD bypass system and that related to this a new flow measurement uncertainty analysis will be submitted in a few months to support a lower RCS flow measurement uncertainty value than currently in the Technical Specifications.