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BBS-73-7

January 9, 1973

Mr. Angelo Giambusso
Deputy Director for Reactor Projects
Directorate of Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

Reference: Quad-Cities Nuclear Power Station, Unit 2
Docket No. 50-265, License DPR-30

Dear Mr. Giambusso

The purpose of this letter is to inform you of the details concerning an abnormality in the sodium pentaborate solution level in the Unit 2 Standby Liquid Control System storage tank. This was reported to you by telegram on December 22, 1972 as an abnormal occurrence. A review of the level instrumentation calibration has shown that the minimum required level of 3,470 gallons was not exceeded as initially reported. The minimum volume/concentration, however, may not have been satisfied after the initial low level was increased by adding water.

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H.T.
G.L.R.
D.P.
J.K.
W.M.C.
V.O.

On December 17, 1972 with the Unit 2 reactor operating at 80 per cent power a "High/Low Level" alarm was received on the standby liquid control tank at 11:45 a.m. Indication on the 902-5 panel showed the tank level to be high. Operating personnel then discovered that the air flow through the bubbler level indicating device was near zero. When this air flow was increased rapidly and then set correctly at 1.0 scfh, the tank level indicated 68 per cent. Apparently the cold air in the bubbler pipe is causing a local crystallization of the boron solution and restricting flow in the tube. This restriction causes a high back pressure and creates a false high level indication. This effect has been observed before to a lesser extent and has been corrected by periodically blowing out the bubbler tube.

The 68 per cent level in the tank was initially evaluated to be 3,570 gallons. This was based on a volume of 5,250 gallons for the tank at 100 per cent. The solution concentration was greater than 13.4 per cent based on the last sample. Therefore, the decision was made to increase the tank level to 84 per cent and

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sample again. At 12:55 a.m. on December 18, the tank concentration was found to be 10.95 per cent by analysis. Believing that the solution volume was 4,410 gallons (84 per cent of 5,250) the volume/concentration requirement of Technical Specification 3.4.C was assumed to be met. On December 18, 1972 boric acid and borax were added to increase the tank concentration to 12.36 per cent.

The preliminary review of the incident revealed that 5,250 gallons for 100 per cent was incorrect. Station procedures included an information note that the 72 per cent low level alarm is equivalent to 3,650 gallons which would correspond to about 3,450 gallons at 68 per cent. When the actual calibration on the instrument was checked, it was found that the transmitter was not calibrated over the real usable volume of the tank as believed. The instrument zero was 6 inches above the bottom of the tank or 2-3/4 inches above the bottom of the pump suction line. The 100 per cent span of the instrument was equal to 130.2 inches of solution. This data fixes the 68 per cent indicated tank level at 94.5 inches above the tank bottom which is a gross volume of 3,715 gallons. The volume of solution below the pump suction which is not usable is 128 gallons; therefore, the net volume was 3,587 gallons indicated.

Applying the actual instrument zero and span to the 84 per cent level and 10.95 per cent concentration yields a net volume of 4390 gallons. This would be approximately 10 gallons less than the minimum required for a 10.95 per cent solution.

Having a solution volume approximately 10 gallons less than required is not considered to be of major safety significance since a 25 per cent margin provided to allow for imperfect mixing is available. Also considering the accuracy of the level indicating system, the "out of spec" level could have been anywhere from 4330 to 4450 gallons.

With regard to the lost volume in the storage tank, a review of the records indicated that a drop of about 8 per cent or 400 gallons had occurred over the past 3 months. During this period samples were taken twice a month to monitor the concentration instead of monthly since the volume was changing.

The corrective action to prevent a recurrence is directed at the level indication system. As an interim measure the bubbler will be blown out at each time a tank sample is obtained to

prevent a crystal buildup. The instrument calibration and operating procedures are also being revised to reflect the true usable volume between the pump suction and the overflow pipe. As a permanent corrective action a modification is being initated to install a sight glass which will allow level determination with an accuracy of less than 10 gallons.

Very truly yours,

COMMONWEALTH EDISON COMPANY
Quad-Cities Nuclear Power Station

B. B. Stephenson
Superintendent

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