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Attachment to LER 79-017701T-0
Rochester Gas and Electric Corporation
R. E. Ginna Nuclear Power Plant, Unit No. 1
Docket No. 50-244

During the month of August, 1979 from the 6th through the 29th the boric acid storage tank levels were being held at approximately 50%. The boric acid concentrations were running somewhat high between 12.7% and 12.8%. The last two sets of samples before the incident on August 31, 1979 averaged 12.75%.

On August 31, 1979 the routine samples of the boric acid storage tanks were drawn at 0210 hours. The analysis was performed some time after since the technician was also performing other routine duties in the Auxiliary Building. The first analysis of the samples indicated 13.1% and 12.9% boric acid. A recheck of the same sample indicated 13.0% and 13.0% boric acid.

At that time it was decided to resample the tanks. The samples taken at 0510 hours indicated 13.1% and 13.2% boric acid. A third sample taken at 0605 hours also indicated 13.1% and 13.2% boric acid.

Power reduction was started at 0540 hours and corrective action was taken to return the tank concentration to within specification.

At 0845 the storage tank concentrations were: "A" tank 12.4%, "B" tank 12.4% boric acid, and the load reduction was stopped.

One plausible mechanism for concentration is by evaporation. With the tanks being maintained at 50% level, the level instrumentation nitrogen bubblers would slowly build up pressure until they overcame the loop seals and discharged to atmosphere. This would remove water vapor as it bubbled out, allowing water to be removed from the tank.

Another possible mechanism for increasing the concentration is redissolving solid boric acid from the level sensing variable leg. On August 29, 1979 the bubbler tube cleaning procedure was performed. This entails rodding out the boric acid level bubbler tubes. This may have dislodged some solid boric acid which would dissolve when the tanks were recirculated. This is performed weekly and normally does not seem to affect the concentration. When combined with the evaporation effect this may have caused the apparent increase in boric acid concentration.

The other factor which could cause an apparent boric acid concentration increase is sampling error. The normally expected error for this test is $\pm 0.1\%$ boric acid. This can be observed in the reported storage tank concentrations. The major contribution to the systematic error is the method for taking the sample. Since 12-13% boric acid would freeze, the sample must be immediately diluted. To accomplish this a 200 ml volum-

etric flask is filled with demineralized water and a 10 ml aliquot pipeted out of the flask. Then the flask is brought back to full with the boric acid sample. An error of 0.1 ml in this dilution will yield an apparent difference of 0.12% boric acid.

At the time of the incident another possible cause was considered. The 0.100 NaOH titrant had been changed the previous day. To insure this was not the source of error standard boron solutions were checked. The results indicated that the new reagent was of the proper strength. Also a recheck of a "B" reactor coolant loop sample which had been determined with the previous reagent indicated the same concentration. This indicated that both reagents were of the same strength.

To preclude a recurrence of this incident the following steps have been taken.

1. The administrative limits for boric acid concentration were 12.2%-12.8%. If these levels were exceeded in either direction action was taken to bring them back into specifications. We have changed the action levels to include 12.2% and 12.8%. This should insure that small dilutions or concentrations would not result in deviation from the specified concentration.
2. The sampling technique is being studied to find a method to reduce the error. The use of smaller dilutions and/or syringe type pipets may cut down the error.
3. In our investigation to determine the cause of this problem the tank concentrations will be monitored to observe trends in relation to operational conditions, including sampling immediately following bubbler tube cleaning.

