Omaha Public Power District
1623 Harney Omaha, Nebraska 68102
402/536-4000

June 13, 1984
LIC-84-079

Mr. James R. Miller, Chief
U. S. Nuclear Regulatory Commission
Office of Nuclear Regulatory Regulation
Division of Licensing
Operating Reactors Branch No. 3
Washington, D.C. 20555

Reference: Docket No. 50-285

Dear Mr. Miller:

Post Accident Sampling System
(NUREG-0737 - Item II.B.3)

In a telephone conversation on March 6, 1984, the Omaha Public Power District discussed the Post Accident Sampling System (PASS) including the problems being experienced with the pH cell, the Ion Chromatograph, Germanium detectors, and interim sampling capabilities with Mr. E. G. Tourigny of your staff. Since this time, significant progress has been made toward the resolution of these problems. This letter serves to provide an update on the status of the PASS, and to provide a new completion date.

Items discussed as still being outstanding were:

(1) pH Cell

As recommended by the manufacturer, a one-point calibration has been performed on the cell. Additionally, the District has performed a two-point calibration. Both calibrations have been rechecked. The electronic portion of the calibration process still needs to be completed. The plant staff will complete the electronic calibration and will check the 2-point calibration before declaring the pH cell operable.

(2) Ion Chromatograph

The connections for the Ion Chromatograph have been moved from Room 60 (the primary sample room) and have been placed in the corridor for easier accessibility. The Ion Chromatograph has been laboratory tested using the NRC matrix solution including the addition of trisodium phosphate dodecahydrate (TSP), and successful results have been achieved. The District now plans to test the Ion Chromatograph using the connections provided in the corridor to take a sample from the system. If the results of these field tests prove to be satisfactory, the Ion Chromatograph can be declared operable.

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(3) Germanium Detectors

The District had experienced problems with the Germanium detectors. The detectors have functioned from time to time, but in general have not been dependable. The vendor was to the site four times trying to resolve the drift problem, and has stated it is due to the temperature and humidity of the environment in the area. The detectors have been tested in the chemistry lab and operated satisfactorily; (the lab is air-conditioned). In order to determine if it was indeed a temperature and humidity problem, the District built a temporary air-conditioned enclosure around one of the detectors. In this way, the temperature and humidity of the District's environment closely approximated that of the lab. Preliminary results, over the past 2 months, indicate this seems to have alleviated the problem. However, the detector outside the air-conditioned enclosure has also functioned properly. The District will continue to monitor the operation of these detectors. If further results indicate the problems were due to temperature and humidity, the District will pursue permanent corrective action in this area. Based on recent successful results, however, this portion of the system can be considered operable.

(4) Interim Sampling Capabilities

The current interim sampling and analysis capabilities for boron and chloride are presented in the attachment to this letter. It should be noted that these capabilities do not meet (nor is it intended that they meet) the NRC guidance for primary sampling capabilities, but describe the District's ability as far as back-up capabilities are concerned.

Because some testing which must be completed before the system is declared operational cannot be done during shutdown, the District proposes a new date of 30 days after reaching 100% power for system operability. The Post Accident Sampling System Technical Specifications required by NUREG-0737 will also be submitted at that time.

Sincerely,

W. C. Jones
Division Manager
Production Operations

WCJ/DJM/rh-J

Attachment

cc: LeBoeuf, Lamb, Leiby & MacRae
1333 New Hampshire Avenue, N.W.
Washington, D.C. 20036

Mr. E. G. Tourigny, Project Manager

Mr. L. A. Yandell, Senior Resident Inspector

ATTACHMENT

Interim Sampling and Analysis Capabilities
for Boron and Chloride

A. Boron

The current 524 cc sample flask cannot be handled two (2) hours after an accident if the flask contains undiluted reactor coolant. This is based on the fact that the dose rates to the technicians would exceed the GDC-19 guidelines during handling and analysis.

The sample must be diluted if it is to be analyzed two (2) hours after an accident. The dilution factor is based on the accuracy of the gross gamma detectors which each have an accuracy of ± 20%. Thus, the overall accuracy due to dilution, detection and analysis is + 80%, - 50%.

Radiation exposure calculations were performed to evaluate the use of the current flask containing undiluted reactor coolant within 2 hours after an accident. The dose rate on contact was calculated to be 1.08 x 10^5 R/hr. To reduce this exposure, the sample must be diluted by a factor of 380 in order to keep exposure below GDC-19 guidelines. This assumes the technician is handling and analyzing the flask for 2 minutes contact and 20 minutes otherwise. This dilution factor does not consider the error introduced by the gross gamma detectors (± 20%). Because the dilution factor is proportional to the measurements derived from the detectors, the overall dilution error is + 50%, - 33%. Therefore, to compensate for this error, the dilution factor must be adjusted to 510 to ensure the dose rate is within GDC-19 guidelines. (See Table I).

B. Chloride Analysis

Handling of the current 524 cc sample flask for chloride analysis 96 hours after an accident cannot be done if the flask contains undiluted reactor coolant. (This is due to GDC-19 concerns). As with the Boron analysis, the sample must be diluted before analysis. Again, this dilution is dependent upon the accuracy of the gross gamma detectors (± 20%) yielding an overall analysis accuracy (including dilution and detection errors) of + 80%, - 50%. Radiation exposure calculations were performed to evaluate the consequences of using the 524 cc flask 100 hours after an accident. The dose rate on contact was calculated to be 1.1 x 10^4 R/hr.

Upon review, it was concluded that a dilution factor of 67 is required to keep the dose rate below GDC-19 guidelines 100 hours after an accident. This assumes the technician is handling the sample for 2 minutes contact and 15 minutes otherwise.

This dilution factor is unacceptable due to the low detection level recommended by the NRC for chloride analysis (0.075 ppm). Dilution by a factor of 67 would lead to a detection level below 75 ppb. The District's equipment does not have this sensitivity with accurate or reproducible results.

B. Chloride Analysis (Continued)

If, however, the sample was allowed to decay for 1000 hours, a dilution factor of 5.4 would be sufficient to reduce the exposure. This dilution yields acceptable results for low level detection as shown in Table I.

Allowing the sample to decay 1000 hours can be justified as follows. Chloride analysis would essentially be necessary following a depressurized (large-break) LOCA. During a pressurized LOCA there is little or no chance of internal or external contamination of the reactor coolant system leading to chloride build-up. The detection of chloride following a large-break LOCA (100 hours or 1000 hours after the event) is to provide an indication of whether or not the potential for corrosion exists. Within a 100-hour or 1000-hour time frame, attempting to reduce the potential for corrosion is an insignificant task in comparison to the event itself. Therefore, the District believes utilizing a 1000-hour decay time is adequate (and preferable) for meeting NRC guidance for backup chloride sampling and analysis capabilities.

Table I

Analysis	Boron	Chloride	
Decay Time, hrs	2	100	1000
Volume Dilution Factor, cc	510	67	5.4
Accuracy (Includes ± 20% error for Gross Gamma Detectors)	+ 80% - 50%	+ 80% - 50%	+ 80% - 50%
Minimum Sample Concentration, ppm	1020(2)	5	0.4
Lower Detection Level Using Lab Equipment, ppm	2	0.075	0.075
Whole Body Dose, R(1)	2.9	5.0	3.9

NOTES: 1) Dose rates could vary; a safety factor of 2 was used when calculating the exposure.

2) A minimum sample concentration of 1020 ppm is acceptable since the concentration of boron will be >2000 ppm following boron injection. (Reference USAR Table 9.2-2) Additionally, excore detectors can be utilized to verify subcriticality.