



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO MODIFICATION OF THE LICENSING BASES FOR

POST ACCIDENT SAMPLING SYSTEM

OMAHA PUBLIC POWER DISTRICT

FORT CALHOUN STATION, UNIT 1

DOCKET NO. 50-285

1.0 INTRODUCTION

By letter dated September 24, 1993, Omaha Public Power District (the licensee) submitted a request for introducing several revisions and clarifications to the licensing bases for the post accident sampling system (PASS) at Fort Calhoun Station. The following revision and clarifications were proposed:

- Replacement of the in-line isotopic analysis of reactor coolant and containment atmosphere with grab sampling.
- Option to use the primary sample cooler for taking PASS samples of reactor coolant.
- Exemption of certain in-line pressure transmitters and control switches, located at the dead legs, from the recommended procedure for remotely flashing in order to reduce radiation exposure to the personnel performing repair work.
- Delaying sampling the containment sump water for dissolved gases.
- Specifying new values for the accuracy of the PASS gross activity and dissolved gases measurements and validation testing of these instruments.
- Specifying new values for the accuracy of the PASS pH measurements.

2.0 EVALUATION

(1) The licensee decided to delete the capability for automated in-line isotopic analysis of reactor coolant and rely on grab sampling methodology because of a very poor reliability of the in-line instrumentation. Since use of the grab sampling technique was recommended as one of the options for isotopic analysis in Section II.B.3 of NUREG-0737, the proposed modification of the PASS sampling procedure is acceptable.

(2) In the original specification for PASS (Reference 1), the licensee committed to sample for total dissolved gas in the reactor coolant at a

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temperature as close to source temperature as possible which meant bypassing the sample cooler. However, subsequently it was determined that the reactor coolant analysis results are more accurate and consistent if samples are cooled prior to their isolation or analysis. The licensee requested, therefore, an option to modify the PASS procedure which would allow him in the future to use the primary sample cooler in taking PASS samples. This procedure is acceptable because cooling of sampled liquid does not cause release of dissolved gas and representative samples of reactor coolant could be taken by this procedure.

(3) In the original PASS specification (Reference 1) the licensee committed to remotely flush all the instruments in order to reduce exposure to the personnel performing repair work. However, subsequently it was found that some of the pressure transmitters and control switches, located in the end legs, could not be remotely flushed. The licensee proposed, therefore, to leave them unflushed. These instruments are located behind shielded walls in the areas which would not be accessible for routine repairs for which low radiation environment is required. Leaving these instruments unflushed would not impact the accuracy of the sample analysis results because the operating experience indicated that they collect only insignificant amounts of contaminants. The licensee proposal to leave them unflushed is, therefore, acceptable.

(4) The licensee has determined that during large break loss-of-coolant accidents (LOCAs) the sump pumps may not be operable and consequently the PASS sump water samples will not be available early in the accident. However, later in the accident, when the recirculation actuation signal will establish recirculation of the water from the sump, PASS sampling will be possible. Delay in obtaining PASS samples will apply only to the sump water. Samples of the reactor coolant will be available from the beginning of the accident, since they are provided by different systems. This limitation of PASS in the licensee's plant does not invalidate its conformance with the requirements of Section II.B.3 of NUREG-0737 because these requirements apply to sampling of reactor coolant water only.

(5) The licensee has requested to revise the commitments made in the original description of PASS (Reference 1) regarding required accuracy of certain instruments.

The accuracy of the instrument for gross activity measurements was specified as $\pm 20\%$ for the range of $0.37 \mu\text{Ci/cc}$ to 53 Ci/cc . The licensee clarified that this accuracy should be construed as $\pm 20\%$ of the actual instrument reading. This is acceptable because this is how the accuracy of the instrument is normally defined.

The accuracy of the dissolved gas analyzer was specified as $\pm 5\%$ of full scale reading for the range of 0 to 1350 cc/kg . However, recent system modification extended the instrument range beyond 1350 cc/kg and the subsequent error analyses have shown that the new accuracy should be $\pm 25 \text{ cc/kg}$ for the range of 0 to 250 cc/kg and $\pm 10\%$ of the measured value for the range of 250 to 2000 cc/kg . This revision is acceptable because it actually increases the

accuracy for the lower range and the upper range accuracy is consistent with the $\pm 10\%$ requirement of Regulatory Guide 1.97.

The licensee has requested that the validation testing of the dissolved gas analyzer should be performed in accordance to the requirements of Section II.B.3 of NUREG-0737 and not Regulatory Guide 1.97. This revision of the operating procedure is acceptable because the binding requirements for PASS are specified in NUREG-0737.

(6) The licensee requested that in order to facilitate calibration of the PASS in-line pH meter against the grab sample readings, the required accuracy of the pH meter for the range of $5 < \text{pH} < 9$ be increased from ± 0.1 pH units to ± 0.3 p units. This accuracy is consistent with the recommendation of Regulatory Guide 1.97. Also, in the clarification of the PASS requirements (Reference 2) NRC stated that between a pH of 5 and 9, the readings should be accurate within ± 0.3 pH units. The proposed licensee revision is, therefore, acceptable.

3.0 CONCLUSIONS

The staff has reviewed the revisions and clarifications of the PASS operating procedure submitted by the licensee. All the proposed modifications were acceptable because they met the requirements specified CFR 50.34(f)(2)(viii) and Section II.B.3 of NUREG-0737 including the clarifications provided in Reference 2.

4.0 REFERENCES

1. Letter from W.C. Jones (Omaha Public Power District) to R.A. Clark (NRC), dated December 3, 1982.
2. Letter from D.M. Crutchfield (NRC) to D. Vandewalle (Consumers Power Company), dated June 30, 1982.

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