



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

ENCLOSURE 2

SAFETY EVALUATION

BY

RADIATION PROTECTION BRANCH

OFFICE OF NUCLEAR REACTOR REGULATION

1.0 INTRODUCTION

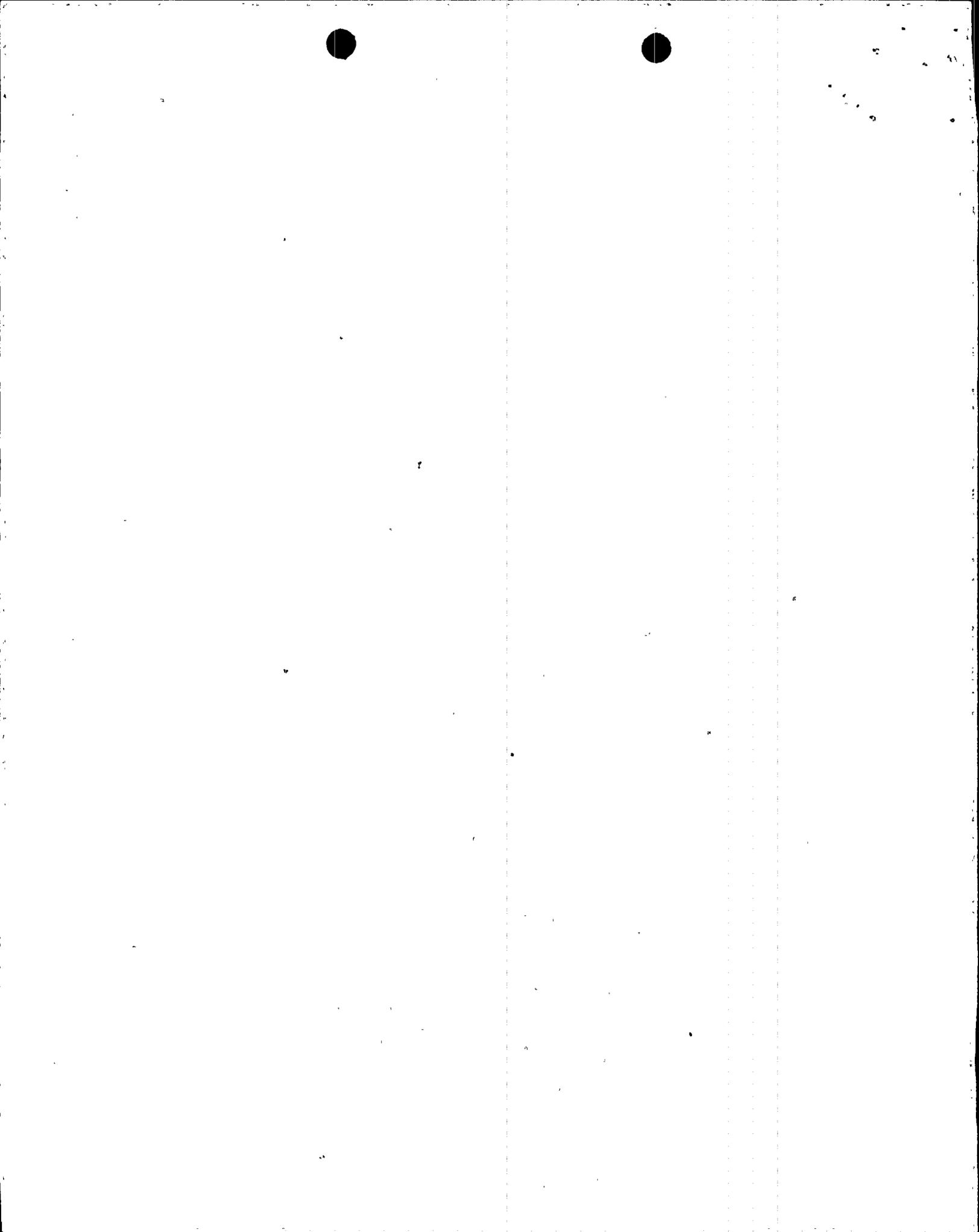
In a letter dated January 18, 1991, Arizona Public Service (APS) provided an analysis related to the potential failure of a tube in a high pressure seal cooler (HPSC). Under certain conditions, such a failure could result in a reactor coolant system (RCS) leak which bypasses the containment. In the January 18 letter and its attachment, the licensee provided information related to the postulated leak, the results of radiological analyses performed by the licensee, and compensatory measures the licensee plans to implement until appropriate plant modifications can be effected.

The Radiation Protection Branch was requested to review this material and identify any safety concerns. In reviewing the licensee's submittal, PRPB considered the situation to be similar to the case of a failure of a small line carrying primary coolant outside containment. Appropriate criteria for use in analyzing the radiological effects of such a failure are described in Standard Review Plan (SRP) 15.6.2 "Radiological Consequences of the Failure of Small Lines Carrying Primary Coolant Outside Containment."

2.0 EVALUATION

In the licensee's January 18, 1991 submittal, the (previously unidentified) scenario was described and the results of radiological analyses were presented. The licensee, in performing its analysis, postulated a number of scenarios with differing assumptions, differing degrees of conservatism, and different results. Of the analyses performed by the licensee, the applicable one involved the guillotine rupture of a high pressure seal cooler tube. Using assumptions applicable to this scenario in accordance with conservative criteria described in regulatory documents (e.g. Standard Review Plan and Regulatory Guides) the licensee calculated that thyroid doses at the exclusion area boundary could exceed 10 CFR 100 limits within the first 30 minutes. The licensee performed other analyses, using less conservative assumptions, and estimated exclusion area boundary (EAB) thyroid doses at 10.2 rem for the two-hour period. Because of uncertainties in failed fuel percentages, iodine spiking factors, and to eliminate any undue risk to the public, the licensee has proposed monitoring failed fuel and reactor coolant system (RCS) iodine activity levels. The licensee has proposed that if RCS dose equivalent I-131 levels exceed 0.2

9103180478 910312
PDR ADOCK 05000528
P PDR



microCi/cc, "engineering will re-evaluate the Justification for Continued Operation (JCO) and if deemed necessary, add compensatory actions." Neither the criteria to be used in making this determination, nor the nature of the compensatory actions to be implemented are specified.

The Radiation Protection Branch has reviewed the licensee's January 18, 1991 submittal and finds that the postulated event is analogous to that described in NUREG-0800 Standard Review Plan (SRP) Section 15.6.2 "Radiological Consequences of the Failure of Small Lines Carrying Primary Coolant Outside Containment." Consequently, the staff believes that the assumptions, methodology, and acceptance criteria set forth in SRP 15.6.2 are appropriate and should be applied to the case at hand. The staff has evaluated the potential radiological consequences of a break in a reactor coolant pump (RCP) high pressure seal cooler (HPSC) at the Palo Verde Nuclear Generating Station (PVGGS) and finds that the analyzed consequences may significantly exceed the acceptance criteria of SRP 15.6.2 (i.e. a small fraction (10%) of the exposure guideline of 10 CFR 100.) Further, the acceptance criteria of 10 CFR 100 would also be exceeded using the assumptions and methodologies set forth in the SRP.

3.0 CONCLUSION

The licensee has identified a possible condition which could result in an interfacing system LOCA (ISLOCA) with containment bypass at any of the three Palo Verde units. It is noted that the postulated scenario involves a small line (1.25") and would not likely lead to core melt. The Radiation Protection Branch has reviewed the information provided by the licensee and has performed calculations which indicate that the postulated scenario may result in consequences which exceed regulatory acceptance criteria.

The licensee should take action to provide assurance that radiological consequences of a high pressure seal cooler tube failure are within regulatory acceptance criteria. Such actions may include reduced permissible levels of coolant radioiodine, increased sampling and analysis of reactor coolant to determine radioiodine levels, as well as more restrictive operating practices which would reduce the potential and actual levels of iodine activity in the reactor coolant. With regard to more stringent operating practices, the licensee should consider, for example, implementing startup, shutdown, and operating procedures and controls which would reduce radioiodine concentrations in the reactor coolant. Further, the licensee should establish a level of equilibrium iodine activity concentrations above which the NRC staff will be promptly notified.

Finally, the licensee should provide details of its proposed actions to correct this issue as well as a more detailed schedule for implementation of corrective measures at each Palo Verde unit.

Principal Contributor: Kenneth T. Eccleston

