TENNESSEE VALLEY AUTHORITY
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FEB 17 1987

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Office of Nuclear Reactor Regulation
Washington, D.C. 20555

Attention: Mr. B. J. Youngblood

In the Matter of	)	Docket Nos. 50-327
Tennessee Valley Authority	)	50-328

SEQUOYAH NUCLEAR PLANT - POSTACCIDENT CONTAINMENT ATMOSPHERE CLEANUP

During a meeting between NRC and TVA management held at NRC offices in Bethesda, Maryland, on January 29, 1987, the means by which postaccident containment atmosphere cleanup would be accomplished at the Sequoyah Nuclear Plant (SQN) were discussed. As a result of those discussions, we took the action to provide NRC with a description of the systems that may be used to effectively perform the subject task. Enclosure 1 provides a description of the system alignment that we propose to use to accomplish postaccident containment atmosphere cleanup, should such an operation be necessary. Please review enclosure 1 and advise us in writing of your disposition on our proposed method of providing for postaccident containment atmosphere cleanup.

Enclosure 2 provides a list of commitments associated with the implementation of the subject method. The dates given are, of course, contingent upon NRC acceptance of the system alignment description given in enclosure 1.

Please direct questions concerning this issue to Timothy S. Andreychek at (615) 870-7470.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

R. Gridley, Director
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Enclosures
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ENCLOSURE 1
SEQUOYAH NUCLEAR PLANT UNITS 1 AND 2
POSTACCIDENT CONTAINMENT ATMOSPHERE CLEANUP

BACKGROUND

Redundant safety-grade hydrogen recombiners have been installed at Sequoyah Nuclear Plant (SQN) to control the potential buildup of hydrogen concentrations inside containment following a postulated design basis Loss-of-Coolant Accident (LOCA). As a backup to the recombiners, a hydrogen purge penetration has also been installed. The purpose of the hydrogen purge penetration was to provide, if required, a means of maintaining hydrogen concentration inside containment below the level of four percent by volume following a postulated LOCA. To accomplish this, the purge operation would need to be actuated approximately nine days following initiation of the event. The airflow rate that can be delivered through the hydrogen purge penetration was designed to provide the equivalent hydrogen concentration reduction as the operation of one hydrogen recombiner.

Following the accident at Three Mile Island Unit II (TMI-II), hydrogen ignitors were added inside containment at SQN to control potential hydrogen generation that may occur due to postulated degraded core events. The amounts of hydrogen generated from such events have been predicted to be substantially larger than that generated due to a design basis LOCA and at rates in excess of the capabilities of the hydrogen recombiners to maintain desirable concentration levels. The purpose of the hydrogen ignitors is to provide for the burning of hydrogen before hydrogen concentrations reach levels that could result in damage to containment or critical safeguards equipment.

In consideration of the ease of use of the hydrogen ignitors and that the ignitors would be turned on and left on throughout any postulated event that may result in hydrogen generation, it was determined that the hydrogen purge penetration would not be used to mitigate hydrogen generation under any circumstances.

ISSUE

At SQN, the hydrogen purge penetration, designated as penetration X-40D, is currently configured with a check valve inside containment and a blind flange with a double O-ring seal outside containment. A spool piece is provided adjacent to the blind flange that is to be used to connect the penetration to the air supply. NRC has questioned the accessibility of this penetration from postaccident dose considerations.

Furthermore, as a result of the consequences of the accident at TMI-II, NRC has identified the desirability for containments to have the capability of performing postaccident radiological cleanup of containment atmosphere. Initially, the hydrogen purge penetration was considered by NRC as a candidate for postaccident containment atmosphere cleanup. Again, due to the current configuration of that penetration, NRC has questioned the accessibility of penetration X-40D from postaccident dose considerations.

RESOLUTION

The hydrogen purge system was not designed to be used for postaccident containment atmosphere cleanup. The airflow rate that the system can deliver to containment is about 100 SCFM, which is too low to be very effective for atmosphere cleanup. Also, the exhaust path of this system is into the secondary containment annulus. Thus, use of the hydrogen purge system to perform postaccident containment atmosphere cleanup would also contaminate this region.

There are four upper compartment purge lines, two of which are supply lines and two of which are exhaust lines, that can be used for postaccident containment atmosphere cleanup. The upper compartment purge air supply penetrations are designated X-9A and X-9B, and the upper compartment purge air exhaust lines are designated X-6 and X-7. These purge lines are equipped with isolation valves that are operable from the main control room. The containment purge exhaust is equipped with high efficiency particulate attenuation (HEPA) and charcoal bed filters. The containment purge exhaust system, including fans and filters, is a safety-grade system. Power supply to the exhaust fans and isolation valves is by means of redundant 1E sources, and the system is classified seismic Category I. The upper compartment purge lines meet or exceed all requirements of 10 CFR 50.44, Regulatory Guide 1.7, and section 6.2.5 of the Standard Review Plan. TVA will utilize a pair of upper compartment purge lines, one a supply line and one an exhaust line, for the purpose of postaccident containment atmosphere cleanup. These upper compartment purge lines will provide for the efficient, effective, and safe postaccident radiological cleanup of containment atmosphere.

SUMMARY

TVA recognizes the desirability of having an operable system to provide for postaccident containment atmosphere cleanup. TVA has determined that the upper compartment purge lines are suitable for the subject purpose. TVA will use a pair of these lines, one a supply line and one an exhaust line, to accomplish postaccident containment atmosphere cleanup without release of contaminated containment exhaust to the ambient atmosphere. These penetrations satisfy all applicable requirements and criteria to ensure the safe, effective, and efficient postaccident cleanup of containment atmosphere.

ENCLOSURE 2
SEQUOYAH NUCLEAR PLANT UNITS 1 AND 2
POSTACCIDENT CONTAINMENT ATMOSPHERE CLEANUP

COMMITMENTS

COMMITMENT	DUE DATE [1]
1. Update FSAR to include description of postaccident containment atmosphere cleanup operation.	April 15, 1988

Note:

(1) Due date given is contingent upon NRC approval of this submittal.

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