Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381

FEB 0 7 1995

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of the Application of	)	Docket Nos. 50-390
Tennessee Valley Authority	)	50-391

WATTS BAR NUCLEAR PLANT (WBN) - POST ACCIDENT SAMPLING SYSTEM - NUREG-0737 (ITEM II.B.3) (TAC M90253 AND M90254)

The purpose of this letter is to provide the scenario objectives for the Post Accident Sampling System (PASS) demonstration test to be performed during WBN's Hot Functional Test (HFT) 2, as committed in TVA's letter of January 5, 1995. In addition, Enclosure 1 to this letter amends TVA's September 20, 1983, response to several criteria of NUREG-0737, Item II.B.3, "Post Accident Sampling Capability." These clarifications more accurately reflect how WBN will meet NUREG-0737 utilizing our current programs and procedures. TVA will update WBN's Final Safety Analysis Report (FSAR) consistent with these changes under FSAR Amendment 89.

As reported in TVA letters of January 5 and 10, 1995, WBN will perform a practical demonstration "test" of the PASS during HFT 2, planned for Spring 1995. The following are the objectives for this test scenario:

1) A sample of reactor coolant system liquid will be collected at normal operating temperature and pressure in the PASS cart/cask assembly located at the liquid sample panel.

2) The sample will be collected using approved plant post accident sampling procedures.

3) The sample will be transported in the cart/cask assembly to the railroad bay (as if for offsite analysis) within the time limits specified in the applicable mission dose calculation.

4) The above demonstration will be performed by plant chemistry technicians wearing full protective clothing. Transport of the cart/cask will be limited to two persons as assumed in the mission dose calculation.

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Enclosure 2 summarizes the new commitments made in this submittal.

If you should have any questions, contact J. Vorees at (615)-365-8819.

Sincerely,

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ENCLOSURE 1

The following information amends TVA's September 20, 1983, response to NUREG-0737, Item II.B.3, Criterion 1, 2, 8, and 10. Revision bars and a brief justification are provided for the changed information.

CRITERION 1

"The licensee shall have the capability to promptly obtain reactor coolant samples and containment atmosphere samples. The combined time allotted for sampling and analysis should be three hours or less from the time a decision is made to take a sample."

RESPONSE

The Watts Bar Nuclear Plant has a Post Accident Sampling Facility (PASF) for each unit (Unit 1 and Unit 2) that is designed to safely obtain, transfer, and dispose of, as necessary, samples from (1) the reactor coolant hot legs 1 and 3, (2) the containment sump water via the residual heat removal (RHR) system when in the recirculation mode of operation, and (3) the containment atmosphere.

The PASF is located in the Auxiliary Building on elevation 729 between columns A-5, W, and X (Unit 1) and between columns A-11, W, and X (for Unit 2). Each PASF contains all the equipment necessary to obtain the required samples following a loss of coolant accident (LOCA) including the equipment for chemical analysis which is performed on-line (except for containment air hydrogen analysis).

The radiochemical laboratory located on elevation 713 between columns A-1, S, and U will be used for required boron and isotopic analysis. The time to travel from the PASF to the radiochemical laboratory has been estimated to require four minutes.

Sample acquisition and portions of the chemical analysis are performed by the Sentry Equipment Corporation (SEC) "Model A" High Radiation Sampling System (HRSS). This system is composed of the liquid sample panel (LSP), chemical analysis panel (CAP), containment air sample panel (CASP) and their associated control panels. During accident conditions the following samples can be obtained from the LSP:

(a) Undiluted and diluted (1000:1) liquid grab samples of the reactor coolant or containment sump water.

(b) An inline sample of reactor coolant which is depressurized and degassed in place. The stripped gas and depressurized coolant is then sent to the CAP.

(c) Diluted (15,000:1) stripped gas grab samples from the reactor coolant pressurized liquid samples.

The LSP, CASP and CAP have the capability to purge lines before sampling to assure representative samples can be obtained. Sample lines from the LSP, CASP, and CAP can be flushed after the sampling operations are complete to reduce residual radioactivity in the lines.

The LSP uses a shielded cart/cask for the removal of the reactor coolant. The cask is mounted on a cart, which allows the samples obtained to be mobile. A shielded syringe can be used to acquire an aliquot of the sample from the cart/cask for further dilution if necessary. The sample can then be transported in a shielded container to the radiochemical laboratory for offline boron and isotopic analysis.

TVA will use the Radiological and Chemical Technology (RCT) containment atmosphere separations device for obtaining a sample of the containment atmosphere. The RCT device separates the sample into particulates, iodine, and noble gases. Particulates are removed by a filter, iodines by a silver zeolite cartridge, and the noble gases are then obtained in a sample vial. This system provides samples that can be transported in a shielded container to the radiochemical laboratory for further analysis.

The following is a list of typical sample acquisition and analysis performance times:

(a)	Reactor coolant sample		
	(i)	Reactor coolant diluted sample acquisition	50 minutes
	(ii)	Sample dilution	10 minutes
	(iii)	Reactor coolant dissolved hydrogen analysis	20 minutes
	(iv)	Sample transport	4 minutes
	(v)	Gamma isotopic analysis	15 minutes
	(vi)	Boron analysis	15 minutes
	Total		114 minutes
(b)	Containment atmosphere		
	(i)	Containment atmosphere sample acquisition (particulate, iodine, noble gas)	36 minutes
	(ii)	Sample transport	4 minutes
	(iii)	Gamma isotopic analysis	45 minutes
	(iv)	Containment hydrogen (inline monitor)	11 minutes
	Total		96 minutes

The offline boron analysis is expected to require approximately ten minutes.

One of the following samples will be determined within the three hour time limit. As appropriate, the other sample will also be taken, but is not subject to the three hour time constraint:

(a) Reactor coolant radionuclides, hydrogen, and boron concentration.

(b) Containment radionuclides and hydrogen.

CHANGE JUSTIFICATION

Included the containment sump sample capability to the list of sample points available during an accident since this will be the most likely sample point in a loss of coolant accident. The reference to the sample volume transported to the lab was removed since this volume will be determined by the dose rate external to the bottle. The reference to the placement of the sample in the lab was deleted since the sample should remain in the shielded sample carrier as much as possible to reduce personnel exposure from additional handling.

Reference to the method of transport and dilution of the diluted stripped gas sample was removed since the method of transport and dilution will be determined by the dose rate external to the bottle. The reference to the CASP shielded cart/casks was removed because all containment atmosphere grab sampling will be performed via the RCT sampler. Sample acquisition times supplied by the vendor were replaced by typical sample acquisition times determined from actual performance data to more accurately outline equipment capabilities.

Clarified the three-hour time limit for sampling since the constraint applies to one sample (either reactor coolant or containment atmosphere), whichever is the more representative for the type of accident experienced.

CRITERION 2

"The licensee shall establish an onsite radiological and chemical analysis capability to provide, within the three-hour time frame established above, quantification of the following:

(a) Certain radionuclides in the reactor coolant and containment atmosphere that may be indicators of the degree of core damage (e.g., noble gases, iodines and cesiums, and nonvolatile isotopes);

(b) Hydrogen levels in the containment atmosphere;

(c) Dissolved gases (e.g., H_2), chloride (time allotted for analysis subject to discussion below), and boron concentration of liquids.

(d) Alternatively, have inline monitoring capabilities to perform all or part of the above analysis."

RESPONSE

2(c) Most of the chemical analyses, on the reactor coolant, will be performed by the SEC CAP. Its capabilities are stated below:

Analysis	Range	Accuracy
Chloride Concentration	100-1000ppb	±15%
	1-20 ppm	±20%
Dissolved Hydrogen	10-2000 cc/kg	±15%
Dissolved Oxygen	0-20 ppb	±10%
	0-200 ppb	
	0-20 ppm	
Dissolved Oxygen	0.1-5 ppm	±10%
	1-10 ppm	
	1-20 ppm	
pH Determination	1-13 standard units	±0.5%

The range of the Comsip-Delphi hydrogen analyzer is 0-10 percent.

Isotopic analysis will be performed in the range of 1 μCi/ml to 10 Ci/ml with a sensitivity better than 1 μCi/ml.

The boron analysis will be performed by ion chromotography using an instrument that has a range 0.5 ppm to 20 ppm with a minimum accuracy of ±20 percent (2 sigma percent error).

The analyses described in items 2(a), 2(b), and 2(c) will be performed, as required, within the three-hour time constraints discussed in response to Criterion 1. The reactor coolant chloride analysis will be performed within four days.

2(d) The SEC CAP uses the following inline instrumentation:

a. Baseline Gas Chromatograph - Model 1030A
b. Beckman pH Monitor - Model 960B
c. Dionex Ion Chromatograph - Model 10
d. Rexnord Dissolved Oxygen Analyzer - Model 3400-5
e. YSI Dissolved Oxygen Analyzer - Model 56

CHANGE JUSTIFICATION

2(c) Removed the reference to the type of laboratory instrument used for boron analysis to allow for future system enhancements. Deleted ion chromatography volume reference to allow use of automated methods of sample loading to minimize personnel dose.

2(d) Removed reference to the Dionex ion chromatograph for boron since it is not an inline instrument.

CRITERION 8

"If inline monitoring is used for any sampling and analytical capability specified herein, the licensee shall provide backup sampling through grab samples, and shall demonstrate the capability of analyzing the samples. Established planning for analysis at offsite facilities is acceptable. Equipment provided for backup sampling shall be capable of providing at least one sample per day for 7 days following onset of the accident and at least one sample per week until the accident no longer exists."

RESPONSE

The SEC panels provide inline analysis as well as backup diluted or undiluted grab samples. By having this flexibility and considering the capabilities of the SEC equipment as discussed in response to item 1, the SEC system should be able to supply one sample per day for seven days and, as a minimum, one sample per week until the accident condition no longer exists.

CHANGE JUSTIFICATION

Removed the reference to shipment of reactor coolant to an offsite laboratory. All backup analysis to inline monitors (pH, chloride) is performed onsite in the radiochemical laboratory.

CRITERION 10

"Accuracy, range, and sensitivity shall be adequate to provide pertinent data to the operator in order to describe radiological and chemical status of the reactor coolant system."

RESPONSE

See response to Criterion 2(c). The equipment used in postaccident sampling and analyses will be calibrated or tested annually. This testing may include comparison to samples collected at other sample points, as necessary to ensure the samples are representative. Retraining of operators for post accident sampling is required annually under current plant procedures and will involve operation of the PASS to actually take samples of fluids in pertinent systems, as plant conditions allow.

CHANGE JUSTIFICATION

Removed reference to train one half the operators every six months. Training on an annual basis will allow more efficient use of training resources and a greater focus on the subject matter.

ENCLOSURE 2

SUMMARY OF COMMITMENTS

1. TVA will update WBN's FSAR consistent with our enclosed clarifications (Enclosure 1) to NUREG-0737, Item II.B.3 under FSAR Amendment 89.

2. WBN will perform a practical demonstration "test" of the PASS during HFT 2, planned for Spring 1995. In summary, the objectives for this scenario include the collection and transport (within required time limits) of an RCS sample at normal operating temperature and pressure using the PASS cart/cask. Transport of the cart/cask will be performed by a maximum of two plant chemistry technicians wearing protective clothing using approved plant procedures.

3. The equipment used in postaccident sampling and analyses will be calibrated or tested annually.