TABLE 7.5-2 (Sheet 5)
TABLE OF VARIABLES
FOR POSTACCIDENT MONITORING

Variable Description	Type/ Category	Minimum Range From	Minimum Range To	Redundancy Required	Notes
Plant, Environs RAD-PORT Inst (Photons)	E3	1E-3	1E4 RADS/HR	N/A	
Post Accident Sampling (PAS) (On Site Analysis)	--	--	--	--	Depends on Sample See Below
PAS, containment Air GAMMA Spectrum	E3	See Notes		N/A	Isotopic Analysis
~~PAS, Containment Air H2 Content~~	~~E3~~	~~0~~	~~30%~~	~~N/A~~	
~~PAS, Containment Air Oxygen Content~~	~~E3~~	~~0~~	~~30%~~	~~N/A~~	
PAS, Primary Coolant & Sump Boron Content	B3 E3	50	6000 PPM	N/A	See Deviation No. 28
PAS, Primary Coolant & Sump Chloride Content	E3	0.1	20 PPM	N/A	
PAS, Primary Coolant ~~& Sump~~ Dissolved H2 or Total Gas	E3	10	2000 cc(STP)/kg	N/A	See Deviation No. 22
~~PAS, Primary Coolant & Sump Dissolved Oxygen~~	~~E3~~	~~0.1~~	~~20 PPM~~	~~N/A~~	~~On-Line Monitoring~~
PAS, Primary Coolant & Sump GAMMA Spectrum	E3	See Notes		N/A	Isotopic Analysis
PAS, Primary Coolant & Sump Gross Activity	C3 E3	10	1E7 uCi/ml	N/A	
~~PAS, Primary Coolant 3 Sump Ph~~	~~E3~~	~~1~~	~~13 Ph~~	~~N/A~~	
Pressurizer Heater Status	D2	0	800 AC Amps	N/A	
Pressurizer Level	A1 B1 C1 D2	0	100% OF Cylindrical Portion	3 Channels	Actual Range 210 to 474 Inches, Trend Recorder Required

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DEVIATION 2

VARIABLE (3)

Containment Hydrogen Concentration

DEVIATION FROM RG 1.97 GUIDANCE

The range recommended in RG 1.97, Revision 2, is 0 to 30 percent, whereas SQN has provided instrumentation for this variable with a range of 0 to 10 percent.

JUSTIFICATION

SQN has performed an analysis that shows the worst-case hydrogen concentration will be less than 8 percent with the glow plugs (hydrogen igniters) operating. Thus, the instrumentation will be on scale at any particular time. The hydrogen igniters' operation is indicated in the control room by both indicator lights and alarms. ~~Additionally, SQN's postaccident sampling system can provide diverse indication for this variable.~~ NRC concurs with SQN that the range provided of 0 to 10 percent is adequate. (Reference: NRC letter to S. A. White dated May 11, 1987, "Emergency Response Capability - Conformance to Regulatory Guide 1.97, Rev. 2 [TAC 51133/51134]")

DEVIATION 22

VARIABLE (111)

Postaccident Sampling

DEVIATION FROM RG 1.97 GUIDANCE

The RG 1.97, Revision 2 (refer to Table 2, Type E variables), recommends that primary coolant grab sample capability exists for hydrogen analysis.

JUSTIFICATION

~~SQN's postaccident sampling facility (PASF) currently uses inline measurement of primary coolant hydrogen by gas chromatography. Backup methods to inline monitoring are recommended in Item II.B.3 of NUREG 0737 and Table 2 (Type E variables) in RG 1.97; however, SQN did not commit to this capability in any of TVA's letters referenced in SQN's license condition. Further, NRC incorrectly noted in the safety evaluation for license amendment authorizing SQN's postaccident sampling (PAS) system operation that backup methods exist for analyzing dissolved hydrogen in reactor coolant samples. To address these inconsistencies, TVA has issued a condition adverse to quality report (SQP890402). Presently,~~ as part of the corrective action to SQP890402, SQN Nuclear Engineering has conducted a design study to define the scope and schedule for modifying SQN's PASF to provide hydrogen grab sampling capabilities with a range of 10 to 2,000 cc standard temperature and pressure/kilogram (STP/kg). TVA considers this range to be sufficient for estimating postaccident core degradation and corrosion potential of the primary coolant. ~~TVA requests that NRC provide interim approval of SQN's proposed deviation until plant modifications to SQN's PASF can be completed (Cycle 5 refueling outage for both units).~~

DEVIATION 28

VARIABLE (111)

Postaccident Sampling

DEVIATION FROM RG 1.97 GUIDANCE

RG 1.97, Revision 2, recommends that the analysis range for boron content in the primary coolant and sump be between 0 to 6,000 parts per million (ppm). TVA recommends that the range be between 50 to 6,000 ppm.

JUSTIFICATION

For boron concentrations below 500 ppm, the tolerance for SQN's instrumentation would be limited to plus or minus 50 ppm. This tolerance band is considered by TVA to be acceptable for ensuring that postaccident shutdown margin is maintained. TVA's position is that the current range capability for boron analysis (50 to 6,000 ppm) is sufficient.

Air flow is from areas of lower radioactivity potential to areas of greater radioactivity potential. All exhaust air is monitored for excessive radioactivity levels.

Fire dampers are used to prevent the spread of fire between the CDWEB and the waste package area of the Auxiliary Building.

9.4.9.2 <u>System Description</u>

The CDWEB ECS is shown on Figures 9.4.2-1 and 9.4.9-1.

Air induced by the CDWEB supply fan from the waste package area supply duct is used for building ventilation. The ventilation air is supplied to areas of low radioactivity potential and migrates by naturally induced flow paths to progressively higher areas of contamination.

The CDWEB ventilation exhaust fan exhausts air from the area with highest contamination potential and directs it to the Fuel Handling Area Exhaust System where it is passed through a radiation monitoring station prior to its release to the atmosphere.

The CDWEB utilizes one speed ventilation fans. The fans are manually controlled and operate continuously.

Additionally, separate air-conditioning recirculation systems serve the potentially contaminated areas and the moderately contaminated areas.

9.4.9.3 <u>Safety Evaluation</u>

No nuclear safety-related systems or components are located in the Condensate Demineralizer Waste Evaporator Building. Therefore, a single failure within the EC System will not affect nuclear safety. 2

9.4.9.4 <u>Inspection and Testing Requirements</u>

The CDWEB ECS will be tested initially to assure that design criteria have been met. Continued satisfactory operation will demonstrate the system capability.

9.4.10 <u>Postaccident Sampling Ventilation System</u>

9.4.10.1 <u>Design Basis</u>

The postaccident sampling facility environmental control system (PASFECS) provides heating, cooling, and ventilation during normal plant operations and training activities. In addition, heating, ventilation, and control of airborne radiological contamination is provided during postaccident acquisition and testing of samples. This is accomplished through pressurization of the areas by the ventilation system which induces air from areas of lesser to areas of greater contamination potential. The system maintains temperatures within a range of 50°F to 104°F. The 6 PASFECS has redundant isolation capability in all ductwork which interfaces with the Auxiliary Building Gas Treatment System (ABGTS) or penetrates the Auxiliary Building Secondary Containment Enclosure (ABSCE).

9.4.10.2 System Description

The PASFECS is shown on the following figures:

9.4.10-1 (Flow Diagram 47W866-15), 9.4.10-2 (Logic Diagram 47W611-31-9), and 9.4.10-3 (Control Diagram 47W610-31-9). The PASFECS consists of a ventilation subsystem (PASFVS), a heating and cooling subsystem (PASFHCS), and a radiological gas treatment subsystem (PASFGTS).

9.4.10.2.1 PASFVS

During normal plant operation, ventilation air is supplied to the facility via the Unit 2 Auxiliary 11
Building general ventilation system and an auxiliary supply fan. Exhaust air is ducted directly to the 11
fuel handling area exhaust fans.

During postaccident conditions or sampling operations, the normal supply and exhaust systems are isolated and ventilation air is taken directly from the outside at a point on the roof of the unit 1 additional equipment building. Both the unit 1 and unit 2 systems share this common intake. A supply fan provides air to the sampling side of the facility in response to a differential pressure controller. Air is drawn from both the sample and valve gallery areas and through a gas treatment 11
system by an exhaust fan and routed to the exhaust duct downstream of the ABGTS air cleanup unit. The sampling area is maintained at a positive pressure $\geq$ 0.12 inch WG with respect to atmosphere while the valve gallery is kept at a negative pressure of $\leq$ 0.25 inch WG with respect to the sample side.

9.4.10.2.2 PASFHCS

In the normal mode of operation, supply air taken from the unit 2 Auxiliary Building general ventilation system has already been tempered and no additional heating or cooling is required.

In the postaccident mode, incoming air is preheated in response to a duct mounted temperature switch. No cooling is provided in this mode. However, the ventilation system will maintain the facility below 104°F with 97°F outside conditions.

9.4.10.2.3 PASFGTS

The radiological gas treatment subsystem consists of one HEPA/charcoal-type air cleanup unit located just upstream of the exhaust fan. Air supplied to the facility during postaccident conditions or sampling operations is processed through the air cleanup unit prior to being discharged to the atmosphere.

9.4.10.3 Safety Evaluation

The PASFECS is not a nuclear safety related system; however, the isolation valves and duct which interface with the ABGTS and ABSCE are designed to Category 1 standards. These valves are also backed by Class 1E power. All remaining portions of the system are designed to Category 1(L) requirements.

9.4.10.4 Inspection and Testing Requirements | 11

The Post Accident Sampling Facility Ventilation Subsystem will be periodically inspected and tested. | 11

Air cleanup units are designed and tested per the requirements of NRC Regulatory Guide 1.140. Preoperational tests provided data for the initial balance of the system and verification of design flow rates.

9.5.10 Postaccident Sampling Facility

9.5.10.1 Design Basis

The postaccident sampling facility (PASF) is designed to safely obtain, transfer, ~~analyze,~~ and dispose of, as necessary, samples of reactor coolant, containment sump water, and the containment atmosphere samples. Each reactor unit has its own respective PASF that will obtain the necessary samples following a loss of coolant accident (LOCA).

9.5.10.2 Facilities

The major components of the postaccident sampling system (PAS) are discussed in the following sections.

9.5.10.2.1 Reactor Coolant and Containment Sump SAMPLING System

Each unit has a reactor coolant sampling system equipped with a closed cooling water heat exchanger to cool the sample as it is acquired by the liquid sampling panel (LSP). Samples are taken from the reactor coolant hot legs and from the containment sump, when the RHR system is in the recirculation mode of operation. 5

~~9.5.10.2.2 Chemical Analysis System~~

~~The sample taken from the LSP is routed to the on-line chemical analysis panel (CAP) where the following analyses are performed.~~

1. ~~Hydrogen concentration using gas chromatography~~
2. ~~Chloride concentration using ion exchange chromatography~~
3. ~~Ionic conductivity~~
4. ~~Temperature~~ 5
5. ~~Dissolved oxygen concentration~~
6. ~~pH~~

~~Analysis 3 through 6 are performed by conventional instrumentation qualified to the range and environmental conditions expected. The ranges for the analyses are shown in Table 9.5.10-1.~~ The PASF is equipped with ~~all necessary calibration reagents, with dilution water, and~~ with flush WATER lines. Waste sample streams are discharged to the PASF Collector Drain Tank which is drained into the tritiated drain collector tank or the containment sump.

5

9.5.10.2.~~3~~ [2] Containment Air Sample [ING] System

Acquisition of the containment air samples is performed by the Radiological and Chemical Technology (RCT) particulate, iodine, and gas separation system and containment air sample panel (CASP), jointly.

These samples are subsequently transported to an onsite facility for isotopic analysis. Hydrogen levels in the containment atmosphere are determined by the containment hydrogen monitors.

9.5.10.~~4~~ [3] [SAMPLING AND] Analysis [CAPABILITIES]

Samples acquired in the PASF will be transported to [AN ONSITE] ~~the radiochemical~~ laboratory where analyses ~~not performed in the PASF~~ will be completed. [PROVISIONALS ARE ESTABLISHED FOR OFF SITE ANALYSIS SUPPORT. THE POST ACCIDENT SAMPLING AND ANALYSIS CAPABILITIES ARE SHOWN IN TABLE 9.5.10-1.]

~~9.5.10.3.1 Online Chemical Analysis~~

~~See Section 9.5.10.2.2.~~

~~9.5.10.3.2 Radiochemical Laboratory~~

~~The radiochemical laboratory will be used to analyze the samples taken from the reactor coolant, containment sump (when RHR system is in recirculation mode), and containment atmosphere. These analyses include, but are not be limited to the following:~~ 5

1. ~~Isotopic analysis will be accomplished by obtaining gamma spectra (germanium detector) of liquid and air samples using established procedures in the counting room located in the radiochemical laboratory.~~

2. ~~Boron analysis can be performed in the existing plant radio-chemical laboratory.~~

9.5.10.~~4~~ [3] Design Evaluation

The design life of all major components, equipment, and instrumentation is 40 years. Items designed for postaccident service will be designed to remain functional in the expected postaccident environment.

9.5.10.~~5~~ [4] Tests and Inspections

The equipment located in the PASF will be tested and inspected to verify equipment operability and availability.

TABLE 9.5.10-1

POSTACCIDENT REACTOR COOLANT WATER ONLINE ANALYSIS CAPABILITIES

Parameter	Analysis Range
Dissolved Hydrogen	10-2000 cc/kg (STP)
Chloride	0.1-20 ppm
Ionic Conductivity	0.1-500 umhos/cm
Dissolved Oxygen	0.1-20 mg/l
pH	1-13

Replace with attached page (new Table 9.5.10-1)

TABLE 9.5.10-1

SEQUOYAH NUCLEAR PLANT REVISED POSTACCIDENT SAMPLING PROGRAM

Sample Point	Parameter	Units	Sample/Analysis Range++	Analysis Accuracy	Sampling/Analysis Accuracy	Sample/Analysis Response Time	Sample Type
RCS and/or Cont. Sump**	Boron	PPM	50 to 6000	± 5% (1000-6000)* ± 50 (50-1000)*	± 10% (500-6000)* ± 50 (50-500)*	8 Hours @,#	Grab Sample
RCS and/or Cont. Sump**	Gamma Spectrum	uCi/mL	Isotopic Analysis	Factor of Two	Factor of Two	24 Hours #	Grab Sample
RCS and/or Cont. Sump**	Gross Activity	uCi/mL	10 to 1E+7	Factor of Two	Factor of Two	24 Hours #	Determine by Totaling Gamma Isotopic Activities
RCS and/or Cont. Sump**	Chloride	PPM	0.1 to 20	± 10% (0.5-20)* ± 0.05 (0.1-0.5)*	± 10% (0.5-20)* ± 0.05 (0.1-0.5)*	24 Hours (Sampling)# 96 Hours (Analysis)#	Provisions Are Established for Off Site Analysis
RCS	Dissolved Hydrogen or Total Gas	CC(STP)/Kg	10 to 2000	± 20% (50-2000)* ± 5.0 (10-50)*	± 20% (50-2000)* ± 5 (10-50)*	24 Hours #	Grab Sample
Containment Atmosphere	Gamma Spectrum	uCi/cc	Isotopic Analysis	Factor of Two	Factor of Two	24 Hours #	Grab Sample
Containment Atmosphere	Hydrogen	Percent	0 to 10	± 1.5	±1.5	Not Applicable	Determine by Reading Containment Hydrogen Analyzers

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** The Containment Sump is Sampled via the Residual Heat Removal System Following a Loss-Of-Coolant Accident.

++ The Sampling/Analysis Ranges Have Been Approved as Part of the Sequoyah Nuclear Plant Regulatory Guide 1.97 Finalized Program.

* Accuracies Are Expressed as 1 Standard Deviation (68% Confidence Interval) Uncertainty Estimates.

@ If Potential Core Damage Is Not Indicated Following an Accident, the RCS Will Be Sampled and Boron Analyzed to Verify Shutdown Margin as Soon as Possible in Response to Emergency Procedures.

Following a Potential Core Damage Accident, Sampling/Analysis is Capable of Being Performed Within the Stated Response Times after the Accident.