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

John H. Garrity
Vice President, Watts Bar Nuclear Plant

OCT 29 1991

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) UNITS 1 AND 2 - EMERGENCY RESPONSE CAPABILITY, REGULATORY GUIDE 1.97, REVISION 2 - REQUEST FOR ADDITIONAL INFORMATION RESPONSE (TAC NOS. 77550 AND 77551)

This letter provides TVA's response for WBN to NRC's request for additional information dated August 26, 1991. The response is attached in Enclosure 1.

Enclosure 2 provides a corrected table that was previously submitted in Attachment 1, Enclosure 1, of TVA's letter dated August 31, 1990, concerning the subject regulatory guide. Enclosure 3 adds Deviations 30 and 31 to Attachment 2, Enclosure 1, of the same TVA letter. A list of commitments is provided in Enclosure 4.

If you have any questions concerning this matter, please telephone G. L. Pannell at (615) 365-1550.

Sincerely,

JHGarrity

John H. Garrity

Enclosures
cc: See Page 2

A003

OCT 29 1991

U.S. Nuclear Regulatory Commission

cc (Enclosures):
NRC Resident Inspector
Watts Bar Nuclear Plant
P.O. Box 700
Spring City, Tennessee 37381

Mr. P. S. Tam, Senior Project Manager
U.S. Nuclear Regulatory Commission
One White Flint, North
11555 Rockville Pike
Rockville, Maryland 20852

Mr. B. A. Wilson, Chief, Project Chief
U.S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

ENCLOSURE 1

WATTS BAR NUCLEAR PLANT (WBN)

RESPONSE TO
NRC QUESTIONS CONCERNING
REGULATORY GUIDE (RG) 1.97, REVISION 2

CONFORMANCE PROGRAM

ENCLOSURE 1

REGULATORY GUIDE (RG) 1.97, REVISION 2
CONFORMANCE PROGRAM

The following provides TVA's response to NRC's request for additional information dated August 26, 1991.

NRC EXCEPTION #1: RADIATION EXPOSURE RATE

The applicant should describe instrumentation for this variable. Where deviations exist from the recommendations of the regulatory guide, the applicant should either justify those deviations or upgrade that instrumentation to bring compliance. See Section 3.3.9.

NRC DISCUSSION

3.3.9 Radiation Exposure Rate

Regulatory Guide (RG) 1.97 recommends Category 2 instrumentation for this variable with a range of 10^{-1} R/hr to 10^{4} R/hr. The purpose of this instrumentation is to provide an indication of containment breach, the detection of significant releases, release assessment, and long-term surveillance. Revision 3 of the regulatory guide deletes the instrumentation for measuring releases caused by a containment breach.

The applicant identified instrumentation to monitor the radiation level in the main control room. However, the range identified is 10^{-1} mR/hr to 10^{4} mR/hr. The limits of the provided range are three decades less than recommended. The applicant did not justify this deviation for this continually manned area. Other instrumentation for this variable is not evident in Reference 6.

The applicant should identify all instrumentation for this variable. Where the instrumentation does not comply with the recommendations of the regulatory guide, the applicant should provide adequate technical justification for those deviations.

WBN RESPONSE

A new variable has been added to Enclosure 1, Attachment 1, of RG 1.97, "Postaccident Monitoring Table of Variables," of WBN's submittal to NRC dated August 31, 1990, "Conformance to RG 1.97, Revision 2." The revised table is provided in Enclosure 2 of this letter and includes the following variable.

WBN RESPONSE (Continued)

VAR NUM	Variable Name	RG 1.97 Type/CAT	WBN Type/CAT	Redundant Channels	RG 1.97 Range From	RG 1.97 Range To
103	Radiation Exposure Rate	E2	E3	N/A	1.0 E-1	1.0 E4

WBN Range From	WBN Range To	Range Units	Display Location	Sensor Location	EQ	SE	QA	PWR Supp	Notes
1.0 E-3	1.0 E4	R/hr	N/A	N/A	No	No	No	N/A	See Deviation #31

NRC EXCEPTION # 1-A: RADIATION LEVEL IN THE MAIN CONTROL ROOM (MCR)

NRC DISCUSSION

The applicant identified instrumentation to monitor the radiation level in the MCR. However, the range identified is 10^{-1} mR/hr to 10^{4} mR/hr. The limits of the provided range are three decades less than recommended. The applicant did not justify this deviation for this continually manned area. Other instrumentation for this variable is not evident in Reference 6.

WBN RESPONSE

WBN has classified MCR radiation level as a Type D, Category 2 variable. The purpose is to provide information to indicate the operation of individual safety systems. Specifically, the MCR radiation monitor is used to verify MCR habitability and indirectly verify isolation, recirculation initiation, and proper ventilation system operation.

This monitor is not intended to meet the Type E variable criteria for radiation exposure rate. The instrument range is adequate for the specified purpose.

JUSTIFICATION

WBN analysis has shown the maximum anticipated Control Room radiation level postaccident is 100 mR/hr, which is well within the range of the current monitor.

ENCLOSURE 1

REGULATORY GUIDE (RG) 1.97, REVISION 2
CONFORMANCE PROGRAM

NRC EXCEPTION #2: ACCUMULATOR TANK LEVEL AND PRESSURE

The applicant should designate either level or pressure as the key variable, and upgrade that instrumentation to Category 2 criteria. If level is the key variable, then the applicant should expand its range to the 10 percent to 90 percent range recommended by the regulatory guide. See Section 3.3.11.

NRC DISCUSSION

3.3.11 Accumulator Tank Level and Pressure

RG 1.97 recommends Category 2 instrumentation with ranges of zero to 750 psig and 10 percent to 90 percent volume. WBN has pressure instrumentation for these accumulators with a range of zero to 700 psig, which exceeds the technical specification requirements. The technical specifications require a nitrogen blanket pressure of 632 psig. A pressure relief valve maintains pressure below 700 psig. We find the present zero to 700 psig range acceptable; it will enable the operator to monitor the discharge of these accumulators.

The range identified for the level instrumentation, 75 percent to 82 percent, is acceptable only if the accumulator tank pressure is the key variable in determining the discharge of the accumulator tanks. We note that the range of the level instrumentation coincides with the technical specification requirements. These requirements are to maintain between 7,632 gallons and 8,264 gallons in each accumulator.

RG 1.97 recommends Category 2 instrumentation for this variable. Category 2 requirements include environmental qualification. Environmentally qualified instrumentation should be available to the operator to monitor the status of the accumulators through the course of an accident. The applicant proposed to use the RCS pressure instrumentation as alternate instrumentation for the accumulator level and pressure instrumentation. However, RCS pressure does not conclusively show that an accumulator, part of a safety-related system, has discharged. Therefore, the applicant should designate either level or pressure as the key variable for observing accumulator discharge. The applicant should provide instrumentation for this key variable that meets the requirements of 10 CFR 50.49 and RG 1.97

WBN RESPONSE

WBN proposes retaining accumulator pressure as a Type D, Category 3 variable with a range of 0-700 psig and accumulator level as a Type D, Category 3 variable.

JUSTIFICATION

The primary function of these instruments is to monitor the preaccident status of the accumulators to ensure the safety function of the system. The pressure and level instrumentation function is to provide the operator information to assure sufficient water and pressurized gas can be maintained in each accumulator for mitigation in the event of a loss-of-coolant accident (LOCA). The four (4) accumulators are a passive safety feature. The only barriers between each accumulator and its respective RCS cold leg are two check valves and one normally open motor operated valve (MOV).

During startup, the MOVs are manually opened as soon as RCS pressure is greater than the accumulator normal operating pressure. After the valves are open, electrical power is removed to prevent inadvertent valve closure.

Type D variables are to help the operator make appropriate decisions in using the individual system important to safety in mitigating the consequences of an accident.

The accumulator level and pressure instrumentation would not provide any information that operator actions could be taken in the event of a LOCA. Following the blowdown phase of a LOCA, the contents of each accumulator are injected into the RCS by the expansion of the pressurized nitrogen cover gas. Since the accumulators are a totally passive system, proper operation of the tanks occurs without operator intervention should RCS pressure fall below accumulator pressure.

Although not qualified to Category 2 criteria, the following indications of accumulator injection can be monitored (two channels per loop):

1. Pressure decreasing and approaching the pressure of the RCS.
2. Low accumulator pressure alarm.
3. Level dropping out of the range of indication.
4. Low accumulator level alarm.

NRC EXCEPTION #3: QUENCH TANK TEMPERATURE

The applicant should expand the range of this instrumentation to include saturated steam conditions of approximately 350°F. See Section 3.3.15.

NRC DISCUSSION

3.3.15 Quench Tank (Pressurizer Relief Tank) Temperature

RG 1.97 recommends a range of 50°F to 750°F for this variable. The applicant's instrumentation has a range of 50°F to 300°F.

The applicant provided the following information to support the deviation from the upper limit of the recommended range. First, the pressurizer relief tank rupture disc operates at 93 ± 7 psig. Assuming worst case limits, this pressure relief limits the temperature of the tank contents to saturated conditions, approximately 350°F. Second, any temperature trending upward would alert the operator to an abnormal condition. The operator would respond by checking other postaccident monitoring instruments.

The regulatory guide states that the instrumentation should always be on scale. The WBN design could permit a high off-scale reading. Therefore, the provided range is not acceptable. The applicant should expand the range to include saturated steam conditions of approximately 350°F (corresponding to 100 psig).

WBN RESPONSE

The pressurizer relief tank temperature instrumentation will be expanded to a range of 50°-400°F.

JUSTIFICATION

N/A

NRC EXCEPTION # 4: AUXILIARY FEEDWATER FLOW

The applicant should clarify the instrumentation provided for this variable and show that each channel has a range that covers to at least 110 percent of the design flow at the transmitter location. See Section 3.3.18.

NRC DISCUSSION

3.3.18 Auxiliary Feedwater Flow

The applicant identified this as a Type A variable, but did not identify the range of the instrumentation. RG 1.97 recommends a range of zero to 110 percent of design flow. The applicant states that the loop design flow is 470 gallons per minute; therefore, the range required is zero to 517 gallons per minute. The applicant also states that the maximum auxiliary feedwater flow is 1880 gallons per minute (4 times 470). The statement leads us to wonder if there is separate instrumentation that indicates total auxiliary feedwater flow. The applicant should clarify the instrumentation provided for this variable and show that each channel has a range that covers to at least 110 percent of the design flow at the transmitter location.

WBN RESPONSE

The Auxiliary Feedwater System has four flow loops with two channels of flow indication per loop. The specified range for this variable is 110 percent of design flow. Actual flow range for each channel is at least 110 percent of design flow. There is no total or combined flow indicator. There is a total flow indication given on the Emergency Response Facilities Data System which is qualified to Category 2 requirements. This indication is available on the computer interface in the MCR.

JUSTIFICATION

N/A

NRC EXCEPTION #5: CONDENSATE STORAGE TANK LEVEL

The applicant should identify the primary source of auxiliary feedwater and verify that Category 1 instrumentation monitors its operation. See Section 3.3.19.

NRC DISCUSSION

3.3.19 Condensate Storage Tank Water Level

RG 1.97 recommends Category 1 instrumentation for this variable, except where the condensate storage tank is not the primary source of auxiliary feedwater. Should another water source be the primary source of auxiliary feedwater, the applicant should identify it and verify that Category 1 instrumentation monitors its availability. The applicant has Category 3 instrumentation for the condensate storage tank water level. Category 3 instrumentation is sufficient for the condensate storage tank water level instrumentation when using another source of auxiliary feedwater.

The applicant did not document the primary source of auxiliary feedwater, but did indicate that they monitor the auxiliary feedwater valves position with Category 1 instrumentation. The applicant should identify the primary source of auxiliary feedwater and verify that its operation is monitored by Category 1 instrumentation.

WBN RESPONSE

The primary source of water supply for the Auxiliary Feedwater System is the Essential Raw Cooling Water (ERCW) System, which meets Category 1 criteria. The ERCW's availability is determined by monitoring the auxiliary feedwater to ERCW interface valve status, which is a Type D, Category 1, valve position indication. Condensate storage tank level indication is Category D 3.

JUSTIFICATION

WBN's safety grade Auxiliary Feedwater System supply is the ERCW system. Therefore, the condensate storage tank is not considered the primary source of auxiliary feedwater. WBN's design is such that if low suction pressure occurs in any auxiliary feedwater pump supply line, safety-grade, Class 1E, powered pressure switches automatically align the pump to the safety-grade ERCW system, which serves as the primary source of auxiliary feedwater. WBN has designated the auxiliary feedwater to ERCW interface valve status as Type D, Category 1, to monitor the availability of the safety grade Auxiliary Feedwater System supply.

NRC EXCEPTION #6: HEAT REMOVAL BY CONTAINMENT FAN HEAT REMOVAL SYSTEM

The applicant should upgrade the containment cooling valve status instrumentation to Category 2 requirements. See Section 3.3.20.

NRC DISCUSSION

3.3.20 Heat Removal By Containment Fan Heat Removal System

RG 1.97 recommends plant-specific, Category 2 instrumentation for this variable. The applicant identified Category 3 instrumentation to monitor the containment cooling valve status. The applicant has Category 2 fan status instrumentation, however, this cannot inform the operator that the cooling units have water circulation. The applicant should upgrade the containment cooling valve status instrumentation to Category 2 requirements.

WBN RESPONSE

WBN has an Ice Condenser Containment System. Cooling water to the lower containment ventilation units is not used for cooling during accident operation. No credit is taken, and the Cooling Water System is not qualified for use postaccident. Therefore, this requirement is not applicable to WBN.

JUSTIFICATION

N/A

NRC EXCEPTION #7: RECORDING OF CATEGORY 1 INSTRUMENTATION

The applicant should provide information to show compliance with the recording recommendations of RG 1.97. See Section 3.3.34.

ENCLOSURE 1

REGULATORY GUIDE (RG) 1.97, REVISION 2
CONFORMANCE PROGRAM

NRC DISCUSSION

3.3.34 Recording of Category 1 Instrumentation

RG 1.97 recommends recording all Category 1 variables. Dedicated recorders should be used when direct or immediate trend or transient information is essential for operator information or action. Computer recording, if continuously updated, or intermittent devices, such as data loggers or scanning recorders, can be used if no significant loss of transient response information occurs with such a device.

The applicant states that all Category 1 variables will have at least one channel recorded by Category 2 recorders. Thus, the recorders do not satisfy the Category 1 criteria. The applicant has not identified Category 1 isolation devices between the Category 1 instrument loops and the Category 2 recorders. The applicant has not justified this deviation. The applicant should provide information to show compliance with the recording recommendations of RG 1.97.

WBN RESPONSE

Category 1 analog variables have at least one of the redundant loops recorded by the Emergency Response Facility Data System (ERFDS) computer. These ERFDS inputs that are trended will be qualified to meet Category 2 requirements up to the input buffer/isolation of the ERFDS. The Category 1 variables will also be monitored in the Main Control Room by redundant Class 1E indictors.

The ERFDS computer is designed to meet the following minimum trending requirements for Category 1 variables:

1. Automatic trending from the start of the accident.
2. Sampling rate will be sufficiently small to ensure adequate data resolution for accident transients.
3. Sufficient data storage capacity.

The following Category 1 variables have at least one of the redundant loops that can presently be monitored by nondivisional trend recorders:

Reactor Coolant System (RCS) Hot Leg Water Temperature
RCS Cold Leg Water Temperature
RCS Pressure, Wide Range (WR)
Steam Generator (SG) Pressure
RCS Pressurizer Level
SG Level, WR
SG level, Narrow Range (NR)
Neutron Flux
Containment Pressure, NR & WR
Containment Radiation
Main Steam Line Radiation
Refueling Water Storage Tank Level
Auxiliary Building Passive Sump Level

The nondivisional trend recorders will be qualified to meet Category 2 requirements and will be isolated from the Class 1E instrument loops associated with Category 1 variables by qualified isolators.

JUSTIFICATION

WBN does not consider the trend recorders or the trending function performed by the ERFDS computer to be critical for accident mitigation; therefore, Category 1 qualification is unnecessary. However, WBN acknowledges that the trending equipment enhances the operator's ability to cope with mitigating various design basis accidents and, for this reason, the trending equipment was qualified appropriately to Category 2 requirements.

NOTE: The Core Exit T/C Temperature (hottest), reactor vessel level, and saturation margin are trended on redundant Class IE plasma displays (the last 30 minute trending only) in the Main Control Room.

NRC EXCEPTION #8: ISOLATION DEVICES FOR CATEGORY 2 INSTRUMENTATION

The applicant should clarify that his or her use of isolation devices complies with the recommendations of RG 1.97. See Section 3.3.35.

NRC DISCUSSION

3.3.35 Isolation Devices for Category 2 Instrumentation

RG 1.97 recommends that Category 2 signals transmitted to other use be transmitted through Category 2 isolation devices. The applicant lists this requirement as not applicable. It is not clear that the applicant satisfies this recommendation or whether no Category 2 signals interface other systems. The applicant should clarify that the use of isolation devices complies with the recommendations of RG 1.97.

WBN RESPONSE

The Category 2 variables at WBN consist of both Class 1E loops and non-Class 1E loops. The Class 1E loops were required by other uses to be Class 1E. The Class 1E loops are isolated from non-Class 1E uses through Class 1E isolators.

Considerable existing plant hardware will be used to meet the RG 1.97 requirements. For the Class 1E instruments, RG 1.97, Category 1 isolation requirements are met because they are consistent with Class 1E design requirements.

The Category 2 non-Class 1E loops, in some cases, interface with non-RG 1.97 equipment, such as the plant computer, ERFDS, the annunciation system, and local indicators. These interfaces occur in mild environments, and normal isolation techniques that are typical throughout the industry for non-Class 1E loops are provided. The types of isolation techniques used are as follows:

- The plant annunciator system uses optical isolation on the input card.

- The ERFDS computer uses optical isolation similar to the annuciator system for digital inputs. Analog inputs are isolated by a resistor network.

- The plant computer uses similar techniques to the ERFDS.

These isolation devices are a part of the Category 2 loop. Components such as local indications that are not isolated by one of the above methods will be qualified to Category 2 requirements.

NRC EXCEPTION #9: DISPLAY LOCATIONS

The applicant should either display this information in the Control Room or provide justification for each variable displayed in locations other than the Control Room. See Section 3.3.36.

NRC DISCUSSION

3.3.36 Display Locations:

RG 1.97 recommends postaccident plant variables for the Control Room operating personnel. Watts Bar has several variables that do not indicate in the Control Room.

VARIABLE	DISPLAY LOCATION
Containment Sump Water Level--Narrow Range	Technical Support Center
120-Vac Vital Inverter Current	Auxiliary Building
120-Vac Vital Inverter Voltage	Auxiliary Building
Pressurizer Heater Status	Technical Support Center
Steam Generator Power Operated Relief and Safety Valve Status	Technical Support Center
Condenser Air Ejector Flow Rate	Technical Support Center
Wind Direction	Technical Support Center
Wind Speed	Technical Support Center
Estimation of Atmospheric Stability	Technical Support Center

The applicant has not justified the deviation in the display location. The applicant should either display this information in the Control Room or provide justification for each variable displayed in locations other than the Control Room.

WBN RESPONSE

VARIABLE	LOCATION	COMMENTS
Containment Sump Water Level-Narrow Range	Main Control Room (MCR)	ERFDS Provides Functions of the Safety Parameter Display System (SPDS)
Pressurizer Heater status	MCR	ERFDS
S/G Power Operated Relief Valve and S/G Safety Valve Status	MCR	ERFDS
Condenser Air Ejector Flow Rate	MCR	ERFDS
Wind Direction	MCR	ERFDS
Wind Speed	MCR	ERFDS
Temperature (Estimation of Atmospheric Stability)	MCR	ERFDS
120V AC Vital Inverter voltage*	1) Aux Bldg Elevation 757-Vital Battery Board Room	Immediately Adjacent to MCR (Same Elevation)
	2) Aux Bldg Elevation 772 - 480 Volt Board Room	One Level Above and in Close Proximity to MCR
120V AC Vital Inverter Current*	Aux Bldg Elevation 772-480 Volt Board Room	One Level Above and in Close Proximity to MCR

*The 120V AC Vital Inverter also has a trouble alarm in the MCR which notifies of trouble on the bus. The alarm is qualified to Category 2 requirements.

JUSTIFICATION:

For the 120V AC Vital Inverter status, an alarm in the MCR will notify MCR personnel of a current or voltage problem on the 120V AC Vital Inverter bus. Actual readings can be easily obtained with a short walk from the MCR. The locations of the direct reading indicators are in a mild environment and accessible after an accident.

WBN considers this to meet the intent of RG 1.97 by providing sufficient and easily accessible indication of 120V AC Vital Inverter bus status.

ENCLOSURE 2

WATTS BAR NUCLEAR PLANT (WBN)

REGULATORY GUIDE (RG) 1.97
TABLE OF VARIABLES

CORRECTIONS

ENCLOSURE 2

REGULATORY GUIDE (RG) 1.97
TABLE OF VARIABLES

CORRECTIONS

The following corrections have been made to Enclosure 1, Attachment 1, Regulatory Guide 1.97, Postaccident Monitoring, Table of Variables, of the WBN submittal dated August 31, 1991. An unpdated table is provided for your convenience.

VARIABLE	CHANGE	JUSTIFICATION
#4-Containment Radiation	WBN Range to Change to 1.0 E7	Establish Consistency with RG 1.97 Requirements for WBN Commitments
#7-Main Steam Line Radiation	WBN Range from Change to 1.0 E-1 WBN Range to Change to 1.0 E3	"
#26-ACAS Pressure	SE-Change to "No" Power Supply-Change to "Non-1E"	Transposition Error
#47-Cont. Sump Water Level (NR)	EQ-Change to "No" QA-Change to "No"	Deviation #12
#48-Containment Sump Water Temperature	Remarks- Correct Spelling of "Qualified"	Typo
#84-Tritiated Drain Collector Tank level	WBN Range from-Change to "4" WBN Range to-Change to "96"	Deviation #25
#88-Airborne Radio Halogens & Particulates	WBN Range from- Change to 1.0 E-9	Establish Consistency with RG 1.97 Requirements for WBN Commitments
#89-Plant & Environs Radiation	WBN Range from- Change to 1.0 E-3	Same justification as Item #88
#96-ERCW Radiation Monitors	WBN Range from- Change to 4.2 E-6 WBN Range to- Change to 2.4 E-2	Correct Scientific Notation
#Various	(A) RG 1.97 Ranges (B) WBN Ranges-Where __ E (Exponent) Is Preceded by "10" Change to 1.0 E (Exponent)	Decimal Inadvertently Omitted
#Various	Display Location- Change "TSC" to "MCR"	*

*Not clarified in the original submittal that former TSC Computer has been replaced by ERFDS computer which displays these variables in the MCR.

Enclosure 2

Regulatory Guide 1.97
Postaccident Monitoring Table Of Variables

Var Num	Variable Name	RG 1.97 Type/Category	Watts Bar Type/Category	Redundant Channels	RG 1.97 Range From	RG 1.97 Range To	Watts Bar Range From	Watts Bar Range to	Range Units	Display Location	Sensor Location	EQ	SE	QA	Power Supply	Notes
1	Auxiliary Feedwater Flow	D2	A1 D2	P1 P2 2 Channels Per Loop	0	110% Design	Note 2	Note 2		MCR	AB	YES	YES	YES	1E	(See Note 1)
2	Containment Lower Comp Atm Temperature	D2	A1 D2	P1 P2 2 Channels	40 Deg F	400 Deg F	0	350	Deg F	MCR	RB	YES	YES	YES	1E	Deviation #8
3	Containment Pressure (Narrow Range)	B1 C1	A1 B1 C1 D2	4 Channels	10 Psia	Design Pressure	-2	15	PSIG	MCR	RB	YES	YES	YES	1E	Deviation #24
4	Containment Radiation	C3 E1	A1 C3 E1	P1 P2 2 Upper 2 Lower	1	1.0E7	1	1.0E7	R/hr	MCR	RB	YES	YES	YES	1E	
5	Containment Sump Level (Wide Range)	B1 C1	A1 B1 C1 D2	P1 P2	Bottom Of Contmnt	600k Gal. Equivalent	0	20	Ft	MCR	RB	YES	YES	YES	1E	
6	Core Exit Temperature	B3 C1	A1 B1 C1 D2	P1 P2 8 PAM 1 8 PAM 2	200	2300	200	2300	Deg F	MCR	RB	YES	YES	YES	1E	Minimum Of 16 Operable Thermo Couples. 4 From Each Quadrant (See Note 1) Deviation # 30
7	Main Steam Line Radiation	C2 E2	A1 C1 E2	1 Channel Per Steam Gen	1.0E-1	1.0E3	1.0E-1	1.0E3	uCi/cc	MCR	RB	YES	YES	YES	1E	(See Note 1)
8	Nuclear Inst. (Source Range)		A1 B1 D2	P1 P2	NA	NA	1	1.0E6	CPS	MCR	RB	YES	YES	YES	1E	
9	RCS Pressurizer Level	D1	A1 D1	P1 P2 P3	Bottom	Top	0	100	%	MCR	RB	YES	YES	YES	1E	(See Note 9)
10	RCS Pressure Wide Range	B1 C1	A1 B1 C1 D2	P1 P2 P3	0	3000	0	3000	PSIG	MCR	AB	YES	YES	YES	1E	(See Note 9)
11	RCS Temperature T Cold	B1	A1 B1 C1 D2	4 Channels 1 Per Loop	50	750	50	700	Deg F	MCR	RB	YES	YES	YES	1E	(See Note 1) Deviation #1
12	RCS Temperature T Hot	B1	A1 D2	4 Channels 1 Per Loop	50	750	50	700	Deg F	MCR	RB	YES	YES	YES	1E	(See Note 1) Deviation #1

Enclosure 2

Regulatory Guide 1.97
Postaccident Monitoring Table Of Variables

Var Num	Variable Name	RG 1.97 Type/Category	Watts Bar Type/Category	Redundant Channels	RG 1.97 Range From	RG 1.97 Range To	Watts Bar Range From	Watts Bar Range to	Range Units	Display Location	Sensor Location	EQ	SE	QA	Power Supply	Notes
13	Refueling Water Storage Tank Level	D2	A1 D2	P1 P2	Top	Bottom	100	0	%	MCR	YD	YES	YES	YES	1E	
14	Steam Generator Level (Narrow Range)		A1 B1	P1 P2 P3 3 Channels Per SG	NA	NA	0	100	%	MCR	RB	YES	YES	YES	1E	(See Note 1 & 9)
15	Steam Generator Pressure	D2	A1 B1 D2	P1 P2 2 Channels Per SG	Atmos. pressure	20% Of Safety	0	1300	PSIG	MCR	AB	YES	YES	YES	1E	Deviation #3
16	Subcooling Margin Monitor	B2	A1 B2 C1 D2	P1 P2	200 *	35 *	200 *	35 *	Deg F	MCR	RB	YES	YES	YES	1E	*200 Deg Subcooling To 35 Deg Superheat
17	Auxiliary Building Passive Sump Level		B1 C1	P1 P2	NA	NA	0	60	Inches	MCR	AB	YES	YES	YES	1E	
18	Containment Isolation Valve Position Indication	B1	B1 D2	1 Per Valve	Closed	Not Closed	Closed	Not Closed		MCR	RB/AB	YES	YES	YES	1E	Deviation #20
19	Containment Hydrogen Concentration	C1	B1 C1 D2	P1 P2	0	30	0	10	%	MCR	RB	YES	YES	YES	1E	Deviation #2
20	Control Rod Position	B3	B3 D3	1 Channel Per Bank	Full In	Not Full In	0	235	Steps	MCR	RB	NO	NO	NO	NON-1E	
21	Nuclear Inst (Intermediate Range)	B1	B1 D2	P1 P2	1.0E-6%	100% Pwr	1.0E-8%	200%	Power	MCR	RB	YES	YES	YES	1E	
22	REACTOR VESSEL LEVEL	B1	B1 C1 D2	P1 P2 Plasma Display	Bottom Of Core	Top Of Vessel						YES	YES	YES	1E	(See Note 5)
22a	Static Mode (Pumps Not Running)						0	100	%	MCR	RB					0% Represents Reactor Vessel Empty
22b	Dynamic Mode (Pumps Running)						0	100	%	MCR	RB					100% Represents Reactor Vessel Full
23	Containment Pressure (Wide Range)	B1 C1	C1	P1 P2	0	4x Design Pressure	-5	60	PSIG	MCR	RB	YES	YES	YES	1E	
24	Shield Building Vent (Noble Gas Activity)	C2 E2	C2 E2	1 Channel	1.0E-6	1.0E4	1.0E-6	1.0E4	uCi/cc	MCR	AB	YES	NO	YES	NON-1E	

Enclosure 2

Regulatory Guide 1.97
Postaccident Monitoring Table Of Variables

Var Num	Variable Name	RG 1.97 Type/Category	Watts Bar Type/Category	Redundant Channels	RG 1.97 Range From	RG 1.97 Range To	Watts Bar Range From	Watts Bar Range to	Range Units	Display Location	Sensor Location	EQ	SE	QA	Power Supply	Notes
25	ABGTS High Pressure Alarm		D2	1 Channel Per Fan	NA	NA	NA	-0.2	In. H2O	MCR	AB	YES	NO	YES	NON-1E	
26	ACAS Pressure	D2	D2	1 Channel Per Train	Plant	Specific	0	150	PSIG	MCR	AB	YES	NO	YES	NON-1E	
27	AFW Valve Status		D1	1 Channel Per Valve	NA	NA	Open	Closed	NA	MCR	AB	YES	YES	YES	1E	
28	Accumulator Flow Isolation Valve Status	D2	D3	1 Channel Per Valve	Open	Closed	Open	Closed	NA	MCR	AB	NO	NO	NO	NON-1E	Deviation #16
29	Accumulator Tank Level	D2	D3	1 Channel Per Tank	10%	90%	7632	8264	GAL	MCR	RB	NO	NO	NO	NON-1E	Deviation #15
30	Accumulator Tank Pressure	D2	D3	1 Channel Per Tank	0 psig	750 psig	0	700	PSIG	MCR	RB	NO	NO	NO	NON-1E	Deviation #6
31	Annulus Pressure		D2	1 Channel	NA	NA	-10	0	In. H2O	MCR	RB	YES	NO	YES	NON-1E	
32	Aux. Feed Pump Turbine Steam Supply Isolation Valve Status		D3	1 Channel Per Valve	NA	NA	Open	Closed	NA	MCR	AB	NO	NO	NO	NON-1E	
33	Battery Current (125V dc Vital)	D2	D2	1 Channel Per Battery	Plant	Specific	-200	+600	AMPS	MCR	AB	YES	NO	YES	N/A	
34	Bus Voltage (125V dc Vital)	D2	D2	1 Channel Per Battery	Plant	Specific	75	150	VOLTS	MCR	AB	YES	NO	YES	N/A	
35	Bus Voltage (480V Shutdown)	D2	D2	1 Channel Per Train	Plant	Specific	0	600	VOLTS	MCR	AB	YES	NO	YES	N/A	
36	Bus Voltage (6.9kv Shutdown)	D2	D2	1 Channel Per Train	Plant	Specific	0	9000	VOLTS	MCR	AB	YES	NO	YES	N/A	
37	CCS Surge Tank Level Abnormal		D3	1 Channel Per Train	NA	NA	0	100	%	MCR	AB	NO	NO	NO	NON-1E	
38	Centrifugal Charging Pump Total Flow	D2	D2	1 Channel	0	110% Design	0	1500	GPM	MCR	AB	YES	NO	YES	NON-1E	

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Regulatory Guide 1.97
Postaccident Monitoring Table Of Variables

Var Num	Variable Name	RG 1.97 Type/Category	Watts Bar Type/Category	Redundant Channels	RG 1.97 Range From	RG 1.97 Range To	Watts Bar Range From	Watts Bar Range to	Range Units	Display Location	Sensor Location	EQ	SE	QA	Power Supply	Notes
39	Charging Header Flow	D2	D3	1 Channel	0	110% Design	0	200	GPM	MCR	AB	NO	NO	NO	NON-1E	Deviation #17
40	Component Cooling Water To ESF Flow	D2	D2	1 Channel Per HX	0	110% Design	0	6000	GPM	MCR	AB	YES	NO	YES	NON-1E	
41	Component Cooling Water Supply Temperature	D2	D2	1 Channel Per Train	32 Deg F	200 Deg F	50	150	Deg F	MCR	AB	YES	NO	YES	NON-1E	Deviation #7
42	Condensate Storage Tank Water Level	D1	D3	1 Channel Per Tank	Plant	Specific	0	400,000	GAL	MCR	AB	NO	NO	NO	NON-1E	Not Primary Source of Aux. Feed Water. See Varible 27
43	Containment Air Return Fan Status	D2	D2	1 Channel Per Fan	Plant	Specific	On	Off	NA	MCR	RB	YES	NO	YES	NON-1E	(Breaker Status)
44	Containment Cooling Valve Status		D3	1 Channel Per Valve	NA	NA	Open	Closed	NA	MCR	AB	NO	NO	NO	NON-1E	
45	Containment Spray Flow	D2	D2	1 Channel Per Train	0	110% Design	0	5000	GPM	MCR	AB	YES	NO	YES	NON-1E	
46	Containment Spray HX Outlet Temperature		D2	1 Channel Per HX	NA	NA	0	200	Deg F	MCR	AB	YES	NO	YES	NON-1E	
47	Containment Sump Water Level (Narrow Range)	B2 C2	D3	1 Channel	Botton Of Sump	Top Of Sump	2	66	Inches	MCR	RB	NO	NO	NO	NON-1E	Deviation #12
48	Containment Sump Water Temperature	D2	D2	1 Channel	50 Deg F	250 Deg F	50	400	Deg F	MCR	AB	YES	NO	YES	NON-1E	Used RHR Inlet Temperature Loop which is qualified
49	Diesel Generator Power	D2	D2	1 Channel Per DG	Plant	Specific	0	7.2	MWATTS	MCR	AB	YES	NO	YES	N/A	
50	Diesel Generator Volts	D2	D2	1 Channel Per DG	Plant	Specific	0	9000	VOLTS	MCR	AB	YES	NO	YES	N/A	
51	ECCS Valve Status		D2	1 Channel Per Valve	NA	NA	Open	Closed	NA	MCR	AB	YES	NO	YES	NON-1E	
52	ERCW Header Flow		D2	1 Channel Per Header	NA	NA	0	20,000	GPM	MCR	*	YES	NO	YES	NON-1E	* See Note 8

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Regulatory Guide 1.97
Postaccident Monitoring Table Of Variables

ar um	Variable Name	RG 1.97 Type/Category	Watts Bar Type/Category	Redundant Channels	RG 1.97 Range From	RG 1.97 Range To	Watts Bar Range From	Watts Bar Range to	Range Units	Display Location	Sensor Location	EQ	SE	QA	Power Supply	Notes
53	ERCW Supply Temperature		D2	1 Channel Per Header	NA	NA	0	200	Deg F	MCR	AB	YES	NO	YES	NON-1E	
54	Emergency Gas Treatment Damper Position	D2	D2	1 Channel Per Damper	Open	Closed	Open	Closed	NA	MCR	AB	YES	NO	YES	NON-1E	
55	Emergency Ventilation Damper Status	D2	D2	1 Channel Per Damper	Open	Closed	Open	Closed	NA	MCR	AB	YES	NO	YES	NON-1E	
56	Hydrogen Recombiner Status		D3	1 Channel Per Recombiner	NA	NA	On	Off	NA	MCR	RB	NO	NO	NO	NON-1E	
57	Igniter Group Status		D3	1 Channel Per Group	NA	NA	On	Off	NA	MCR	RB	NO	NO	NO	NON-1E	
58	Inverter Current (120V ac Vital)	D2	D2	1 Channel Per Inverter	Plant	Specific	0	200	AMPS	AB	AB	YES	NO	YES	N/A	Local Indication
59	Inverter Voltage (120V ac Vital)	D2	D2	1 Channel	Plant	Specific	0	150	VOLTS	AB	AB	YES	NO	YES	N/A	Local Indication
60	Letdown Flow	D2	D3	1 Channel	0	110% Design	0	200	GPM	MCR	AB	NO	NO	NO	NON-1E	Deviation #18
61	MCR Pressure		D3	1 Channel	NA	NA	0	0.50	In. H2O	MCR	CB	NO	NO	NO	NON-1E	
62	MCR Radiation Level		D2	1 Channel	NA	NA	*	*		MCR	MCR	YES	NO	NO	NON-1E	* See Note 6 for range
63	Main Feedwater Flow	D3	D3	1 Channel Per Loop	0	110% Design	0	4,500,000	lb/hr	MCR	AB	NO	NO	NO	NON-1E	
64	Normal Emergency Boration Flow	D2	D2	1 Channel	0	110% Design	0	150	GPM	MCR	AB	NO	NO	YES	NON-1E	Deviation #4
65	THIS LINE INTENTIONALLY LEFT BLANK															
66	Pressurizer Heater Status (Electric Current)	D2	D2	1 Channel Per Group	Plant	Specific	0	50.5	AMPS	MCR	AB	YES	NO	YES	NON-1E	(See Note 3)

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Regulatory Guide 1.97
Postaccident Monitoring Table Of Variables

Var Num	Variable Name	RG 1.97 Type/Category	Watts Bar Type/Category	Redundant Channels	RG 1.97 Range From	RG 1.97 Range To	Watts Bar Range From	Watts Bar Range to	Range Units	Display Location	Sensor Location	EQ	SE	QA	Power Supply	Notes
67	Pressurizer Pressure Relief Valve Pos. (PORV, Block & Code)	D2	D2	1 Channel Per Valve	Closed	Not Closed	Closed	Not Closed		MCR	RB	YES	NO	YES	NON-1E	
68	Pressurizer Relief Tank Level	D3	D3	1 Channel	Top	Bottom	0	100	%	MCR	RB	NO	NO	NO	NON-1E	
69	Pressurizer Relief Tank Pressure	D3	D3	1 Channel	0	Design Pressure	0	100	PSIG	MCR	RB	NO	NO	NO	NON-1E	
70	Pressurizer Relief Tank Temperature	D3	D3	1 Channel	50 Deg F	750 Deg F	50	400	Deg F	MCR	RB	NO	NO	NO	NON-1E	Deviation #11
71	RCP Seal Injection Flow		D3	1 Ch Per RCP	NA	NA	0	15	GPM	MCR	AB	NO	NO	NO	NON-1E	
72	RCS Head Vent Valve Status		D2	1 Channel Per Valve	NA	NA	Closed	Not Closed	NA	MCR	RB	YES	NO	YES	NON-1E	
73	RHR Heat Exchanger Outlet Temperature	D2	D2	1 Channel Per HX	32 Deg F	350 Deg F	50	400	Deg F	MCR	AB	YES	NO	YES	NON-1E	Deviation #9
74	RHR Pump Flow (RHR System Flow)	D2	D2	1 Channel Per Pump	0	110% Design	0	5500	GPM	MCR	AB	YES	NO	YES	NON-1E	
75	RHR Valve Status		D3	1 Channel Per Valve	NA	NA	Open	Closed	NA	MCR	AB	NO	NO	NO	NON-1E	
76	Reactor Coolant Pump Status (Motor Current)	D3	D3	1 Channel Per Pump	Plant	Specific	0	1000	AMPS	MCR	AB	NO	NO	NO	NON-1E	
77	Safety Injection Pump Flow	D2	D2	1 Channel Per Pump	0	110% Design	0	800	GPM	MCR	AB	YES	NO	YES	NON-1E	
78	Safety Injection System Valve Status		D3	1 Channel Per Valve	NA	NA	Open	Closed	NA	MCR	AB	NO	NO	NO	NON-1E	
79	Spent Fuel Pool Level Alarm		D2	1 Channel	NA	NA	748,11-1/2	749,2-1/2	ft,in	MCR	AB	YES	NO	YES	NON-1E	Range Reflects Low and High Alarm Setpoints
80	Spent Fuel Pool Temperature Alarm		D2	1 Channel	NA	NA		127	Deg F	MCR	AB	YES	NO	YES	NON-1E	Upper Range Is Alarm Set point

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Regulatory Guide 1.97
Postaccident Monitoring Table Of Variables

Var Num	Variable Name	RG 1.97 Type/Category	Watts Bar Type/Category	Redundant Channels	RG 1.97 Range From	RG 1.97 Range To	Watts Bar Range From	Watts Bar Range to	Range Units	Display Location	Sensor Location	EQ	SE	QA	Power Supply	Notes
81	Steam Generator Blowdown Isolation Valve Status		D2	1 Channel Per Valve	NA	NA	Closed	Not Closed	NA	MCR	RB	YES	NO	YES	NON-1E	
82	Steam Generator Level (Wide Range)	D1	D1	4 Channels 1 Per SG	Tube Sheet	Separators	0	100	%	MCR	RB	YES	YES	YES	1E	Deviation #10
83	Steam Generator Power Operated Relief And Safety Valves Status	D2	D2	1 Channel Per Valve	Closed	Not Closed	Closed	Not Closed	NA	MCR	AB	YES	NO	YES	NON-1E	
84	Tritiated Drain Collector Tank Level	D3	D3	1 Channel Per Train	Top	Bottom	4	96	%	MCR	AB	NO	NO	NO	NON-1E	Local Indication Deviation #25
85	Volume Control Tank Level	D2	D3	1 Channel	Top	Bottom	0	100	%	MCR	AB	NO	NO	NO	NON-1E	Deviation #19
86	Waste Gas Decay Tank Pressure	D3	D3	1 Channel Per Tank	0	150% Design	0	150	PSIG	MCR	AB	NO	NO	NO	NON-1E	Local Indication Deviation #23
87	Radiation Exposure Meters	E3		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Deviation #22
88	Airborne Radiohalogens And Particulates	E3	E3	Portable	1.0E-9	1.0E-3	1.0E-9	1.0E-3	uCi/cc	ANALYSIS	SAMPLE	NO	NO	NO	NA	Airborne I-131 and particulates
89	Plant And Environs Radiation	E3	E3	Portable	1.0E-3	1.0E4	1.0E-3	1.0E4	RAD/hr	PORTABLE	PORTABLE	NO	NO	NO	NA	
90	Plant and Environs Radioactivity (portable instr.)	E3	E3	PORTABLE	NA	NA	NA	NA	NA	ANALYSIS	SAMPLE	NO	NO	NO	NA	Multi Channel Gamma Ray Spectrometer
91	Auxiliary Building Vent (Noble Gas)	E2	E2	1 Channel	1.0E-6	1.0E3	1.0E-6	1.0E-2	uCi/cc	MCR	AB	YES	NO	YES	NON-1E	Deviation #13
92	Auxiliary Building Vent (Flow Rate)	E2	E2	1 Channel	0	110% Design	0	300,000	CFM	MCR	AB	YES	NO	YES	NON-1E	
93	Auxiliary Building Vent (Part. and Halogens)	E3	E3	1 Channel	1.0E-3	1.0E2	1.0E-9	1.0E-4	uCi/cc	ANALYSIS	SAMPLE	NO	NO	NO	NON-1E	Sampling With Onsite Analysis Capability Deviation #14

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Regulatory Guide 1.97
Postaccident Monitoring Table Of Variables

Var Num	Variable Name	RG 1.97 Type/Category		Watts Bar Type/Category		Redundant Channels	RG 1.97 Range From	RG 1.97 Range To	Watts Bar Range From	Watts Bar Range to	Range Units	Display Location	Sensor Location	EQ	SE	QA	Power Supply	Notes
94	Condenser Air Ejector Flow Rate		E2		E2	1 Channel	0	110% Design	0	2640	CFM	MCR	TB	YES	NO	YES	NON-1E	Total Flow From 3 Air Ejectors
95	Condenser Vacuum Pump Exhaust Vent (Noble Gas)	C3	E2	C3	E2	1 Channel	1.0E-6	1.0E5	1.0E-6	1.0E5	uCi/cc	MCR	TB	YES	NO	YES	NON-1E	
96	ERCW Radiation Monitors				E2	1 Channel Per Discharge Point	NA	NA	4.2E-6	2.4E-2	uCi/cc	MCR	AB	YES	NO	YES	NON-1E	
97	POST ACCIDENT SAMPLE SYSTEM		E3		E3	1 System						GRAB	PASF	NO	NO	NO	NON-1E	
97a	Reactor Coolant Chloride Concentration		E3		E3		0	20	1	20	ppm	NA	SAMPLE					Deviation #29
97b	Reactor Coolant Dissolved Hydrogen		E3		E3		0	2000	10	2000	cc/kg (STP)	NA	SAMPLE					Deviation #21
97c	Reactor Coolant Disolved Oxygen		E3		E3		0	20	0	20	ppm	NA	SAMPLE					
97d	Reactor Coolant Total Dissolved Gas		E3		E3		0	2000	10	2000	cc/kg (STP)	NA	SAMPLE					
97e	Reactor Coolant Boron	B3	E3		E3		0	6000	50	6000	ppm	NA	SAMPLE					Deviation #26
97f	Reactor Coolant PH		E3		E3		1	13	1	13	pH	NA	SAMPLE					
97g	Reactor Coolant Sample Activity	C1	E3	C3	E3		10uCi/ml	10Ci/ml	10uCi/ml	10Ci/ml	Ci/ml	NA	SAMPLE					Deviation #5
97h	Reactor Coolant Gamma Spectrum		E3		E3		NA	NA	NA	NA	NA	ANALYSIS	SAMPLE	NA	NA	NA	NA	Isotopic Analysis
98	CONTAINMENT AIR																	

Enclosure 2

Regulatory Guide 1.97
Postaccident Monitoring Table Of Variables

Var Num	Variable Name	RG 1.97 Type/Category	Watts Bar Type/Category	Redundant Channels	RG 1.97 Range From	RG 1.97 Range To	Watts Bar Range From	Watts Bar Range to	Range Units	Display Location	Sensor Location	EQ	SE	QA	Power Supply	Notes
98a	Containment Air H2	E3	E3		0%	30%	0%	10%	By Vol	ANALYSIS	SAMPLE	NA	NA	NA	NA	Also Measured by Hydrogen Analyzer
98b	Oxygen Content	E3		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Deviation #27
98c	Gamma Spectrum Sample	E3	E3	NA	NA	NA	NA	NA	NA	ANALYSIS	SAMPLE	NA	NA	NA	NA	Isotopic Analysis
99	Shield Building Vent Flow	E2	E2	1 Channel Per Unit	0	110% Design	0	30,800	CFM	MCR	AB	YES	NO	YES	NON-1E	
100	Shield Building Vent Monitor (Particulate And Iodine)	E3	E3	1 Channel Per Unit	1.0E-3	1.0E2	1.0E-3	1.0E2	uCi/cc	NA	SAMPLE	NO	NO	NO	NON-1E	Sampling With Onsite Analysis Capability
101	Steam Generator Discharge Vent (Flow Rate and Noble Gas)	E2	E2	1 Channel Per Release Point	1.0E-1	1.0E3	NOTE 4	NOTE 4		MCR	AB	YES	NO	YES	NON-1E	
102	METEOROLOGY															
102a	Vertical Temperature Difference	E3	E3	1 Channel	-9	+18	-9	+18	Deg F	MCR	YD	NO	NO	NO	NON-1E	
102b	Wind Direction	E3	E3	1 Channel	0	360	0	360	Deg	MCR	YD	NO	NO	NO	NON-1E	
102c	Wind Speed	E3	E3	1 Channel	0	67	0	50	MPH	MCR	YD	NO	NO	NO	NON-1E	Deviation #28
103	Radiation Exposure Rate	E2	E3	No	1.0E-1	1.0E4	1.0E-3	1.0E4	R/hr	NA	NA	NO	NO	NO	NA	Deviation #31

ENCLOSURE 3

WATTS BAR NUCLEAR PLANT (WBN)

REGULATORY GUIDE (RG) 1.97
ADDITIONS TO DEVIATION LIST

ENCLOSURE 3

REGULATORY GUIDE (RG) 1.97
ADDITIONS TO DEVIATION LIST

The following are being added to the deviation list in Enclosure 1, Attachment 2, of TVA's submittal to NRC on August 31, 1990, "Conformance to Regulatory Guide 1.97, Revision 2."

Deviation #30, Variable #6

Deviation from RG 1.97 Guidance

The two channels/trains of the core thermocouple system at the bundling at the common reactor vessel refueling cavity wall penetration do not meet the separation requirement of RG 1.97.

JUSTIFICATION

The design and the installation of the mineral insulated cables used for the core thermocouples within the reactor cavity was completed prior to upgrading the system to satisfy RG 1.97 requirements. The design within the refueling cavity is acceptable because:

1. Only a small self-generated signal exists in the cabling from the thermocouples to the reference junction boxes and, therefore, no chance exists for a postulated propagating fault.

2. Due to the interference provided by the rod control mechanisms and rod position indicator stack, no likelihood exists for rendering all thermocouples inoperable.

Deviation #31, Variable #103

Deviation from RG 1.97 Guidance

RG 1.97, Revision 2, includes exposure rate monitors as Type E (Category 2) variables. These monitors are required to have a range of 1.0 E-1 Rem per hour (R/hr) to 1.0 E4 R/hr and are to be located inside buildings or areas where access is required to service equipment important to safety. The area monitors are intended for use in detection of significant releases, release assessment, and long-term surveillance.

RG 1.97, Revision 2, also included radiation exposure rate monitors, with ranges of 1.0 E-1 R/hr to 1.0 E4 R/hr as Type C variables (these monitors were to be installed inside buildings or areas in direct contact with primary containment where penetrations and hatches were located). This variable was removed from RG 1.97 in Revision 3 and will not be addressed further.

Deviation #31, Variable #103 (Continued)

WBN RG 1.97 monitoring instrumentation does not include installed high-range exposure rate monitors as Type E variables. The intended objectives of such instrumentation will be achieved in a different manner than that described in RG 1.97. The following paragraphs describe how WBN's program is designed to monitor radiation exposure rates.

A large number of useful missions outside the MCR during accident conditions may be postulated. These missions would be for activities, such as equipment maintenance, grab sample acquisition, and laboratory analyses of grab samples, that might enhance accident mitigation. Exposure rates encountered on these missions would vary over a wide range. This variability arises from the fact that most high exposure outside the containment during accident conditions would be attributable to contained sources and, therefore, be strong functions of distance from the sources. Because of the wide exposure rate variability, the installation of even a large number of high-range exposure rate monitoring instruments at selected locations on projected mission routes might not contribute substantially, either to the planning of missions for accident mitigation purposes or to the minimization of dose equivalent to personnel performing the missions.

Based on the above considerations, the WBN radiation monitoring system design uses portable high-range exposure rate instruments in lieu of installed high-range exposure rate monitors. Crews attempting missions outside the MCR following an accident would include Radiological Control personnel provided with high-range exposure rate instrumentation. The range of the Type E portable instrumentation available for this purpose is 1.0 E-3 R/hr to 1.0 E4 R/hr, which is consistent with the range required for area exposure rate monitoring.

Additionally, the TVA radiation monitoring system presently includes normal-range area monitors, each with a range from 1.0 E-1 MR/hr to 1.0E4 MR/hr. These monitors are located throughout the plant in areas where personnel access is common. Although the area monitors are not required to be within the scope of the environmental qualification program and they are not included in the Postaccident Monitoring (PAM) program, monitors located outside the primary containment and other locations of high postaccident exposure rates can be expected to remain on scale and to continue to provide exposure rate indication with required accuracy during accident conditions. The monitors that remain on scale will provide useful input to MCR personnel for assessment of plant exposure rate levels during accident conditions. Based upon this assessment and WBN Radiological Emergency Plan dose limitations, a decision will be made as to whether or not missions outside the MCR would be attempted.

In summary, the WBN position on high-range accident monitoring is that high-range exposure rate instrumentation will not be installed and that high-range monitoring will be provided by portable monitoring instrumentation that meets the RG 1.97 required range.

ENCLOSURE 4

WATTS BAR NUCLEAR PLANT (WBN)

REGULATORY GUIDE (RG) 1.97
LIST OF COMMITMENTS

ENCLOSURE 4

REGULATORY GUIDE (RG) 1.97
LIST OF COMMITMENTS

1. The pressure relief tank temperature instrumentation will be expanded to a range of 50°- 400°F.

2. The nondivisional trend recorders will be qualified to meet Category 2 requirements.

3. Components such as local indications that are not isolated by one of the above methods will be qualified to Category 2 requirements.

4. The WBN Radiation Monitoring System design uses portable high-range exposure rate monitors. The range of the Type E portable instrumentation available for this purpose is 1.0 E-3 R/hr to 1.0 E4 R/hr.