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OCT 22 1990

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 - BYPASSED AND INOPERABLE STATUS INDICATION (BISI) SYSTEM (TAC NOS. 77136 AND 77137)

This letter provides TVA's response to NRC's request for additional information (RAI) dated August 13, 1990, concerning TVA's January 29, 1987 letter. That letter provided the functional requirements document for the BISI System and WBN's conformance to Regulatory Guide 1.47, Revision 0, "Bypassed and Inoperable Status Indication for Nuclear Power Plant Safety Systems." Each of NRC's concerns is addressed in the enclosure.

NRC's RAI requested a 60-day response time from the date of receipt of the letter. A one-week extension for that response was verbally coordinated with NRC's Peter Tam on October 15, 1990.

If there are any questions, please telephone M. C. Bryan at (615) 365-8819.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

R. H. Shell

for E. G. Wallace, Manager
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Enclosure
cc: See page 2

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U.S. Nuclear Regulatory Commission

OCT 22 1990

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ENCLOSURE

RESPONSE TO THE NRC REQUEST FOR ADDITIONAL INFORMATION
CONFORMANCE TO REGULATORY GUIDE 1.47
BYPASSED AND INOPERABLE STATUS INDICATION (BISI)
WATTS BAR NUCLEAR PLANT (WBN) UNITS 1 AND 2

TVA's response to the NRC's request for additional information dated August 13, 1990, is provided below. The items are addressed in the order of their occurrence in the referenced letter.

1. NRC REQUEST: The systems listed in Section 4.0 did not include Service Water System nor the Control Room Habitability System. TVA should address these omitted systems.

   TVA RESPONSE: The Raw Service Water System devices do not receive a signal from the Engineered Safety Features Actuation System (ESFAS). Therefore it is not included in the systems to be monitored for the BISI System.

   The Control Room Habitability System is part of the Heating, Ventilating, and Air Conditioning System and those devices are addressed as part of the logic for that system. (See the attached table.)

2. NRC REQUEST: TVA should provide a list of those Section 4.0 system components which were excluded from being monitored because they were not expected to be rendered inoperable more than once a year.

   TVA RESPONSE: TVA did not exclude any components because they were not expected to be rendered inoperable more than once a year.

3. NRC REQUEST: TVA should provide logic diagrams indicating the monitored components and the logic trees indicating the system inoperable status.

   TVA RESPONSE: The table to this enclosure contains the logic development for the BISI System for WBN Unit 1. Support systems are identified by the words "system abnormal" in the condition monitored column. Support systems of the same train as the system being monitored are logically combined in such a manner that if any one support system in the train being monitored goes into alarm it will cause an alarm for that train. Other inputs for each train of a system are logically combined such that any one input going into alarm will cause an alarm for that train. The logic diagram in Figure 1 demonstrates this logic for the Auxiliary Feedwater System. This logic is typical of the other systems listed in the table.

WATTS BAR NUCLEAR PLANT UNIT 1
BYPASSED AND INOPERABLE STATUS INDICATION (BISI) LOGIC

TRAIN	DEVICE	CONDITION MONITORED
MAIN AND AUXILIARY FEEDWATER (AFW) SYSTEM		
TRAIN A	AFW TRAIN A	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)
	CONTROL AIR TRAIN A	SYSTEM ABNORMAL
	DIESEL GENERATOR (DG) 1A-A	SYSTEM ABNORMAL
	ESSENTIAL RAW COOLING WATER (ERCW) TRAIN A	SYSTEM ABNORMAL
	FCV-3-33	LOSS OF POWER
	FCV-3-87	LOSS OF POWER
	HS-3-118A	IN PULL TO LOCK
	LCV-3-156	ENERGIZED
	LCV-3-164	ENERGIZED
	LCV-3-172	ENERGIZED
	LCV-3-175	ENERGIZED
	MOTOR-DRIVEN AFW PUMP A-A	LOSS OF POWER
TRAIN B	AFW TRAIN B	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)
	CONTROL AIR TRAIN B	SYSTEM ABNORMAL
	DG 1B-B	SYSTEM ABNORMAL
	ERCW TRAIN B	SYSTEM ABNORMAL
	FCV-3-100	LOSS OF POWER
	FCV-3-47	LOSS OF POWER
	HS-3-128A	IN PULL TO LOCK
	LCV-3-148	ENERGIZED
	LCV-3-171	ENERGIZED
	LCV-3-173	ENERGIZED
	LCV-3-174	ENERGIZED
	MOTOR-DRIVEN AFW PUMP B-B	LOSS OF POWER
VENTILATING SYSTEM		
TRAIN A	AUXILIARY BLDG GAS TREATMENT (ABGT) FAN A-A	LOSS OF POWER
	CONTAINMENT AIR RETURN FAN A-A	LOSS OF POWER
	CONTROL AIR TRAIN A	SYSTEM ABNORMAL
	DG 1A-A	SYSTEM ABNORMAL
	DG 2A-A	SYSTEM ABNORMAL
	FCO-30-146A	LOSS OF POWER
	FCO-30-146B	LOSS OF POWER
	HS-30-38A	IN PULL TO LOCK
	HEATING, VENTILATION, AND AIR CONDITIONING (HVAC) TRAIN A	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)

WATTS BAR NUCLEAR PLANT UNIT 1
BYPASSED AND INOPERABLE STATUS INDICATION (BISI) LOGIC

TRAIN	DEVICE	CONDITION MONITORED
TRAIN B	ABGT FAN B-B	LOSS OF POWER
	CONTAINMENT AIR RETURN FAN B-B	LOSS OF POWER
	CONTROL AIR TRAIN B	SYSTEM ABNORMAL
	DG 1B-B	SYSTEM ABNORMAL
	DG 2B-B	SYSTEM ABNORMAL
	FCO-30-157A	LOSS OF POWER
	FCO-30-157B	LOSS OF POWER
	HS-30-39A	IN PULL TO LOCK
	HVAC TRAIN B	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)

AIR CONDITIONING (HEATING AND COOLING)

TRAIN A	CONTROL BLDG EMERGENCY AIR CLEANUP FAN A-A	LOSS OF POWER
	CONTROL BLDG EMERGENCY PRESSURIZER FAN A-A	LOSS OF POWER
	CONTROL AIR TRAIN A	SYSTEM ABNORMAL
	CONTROL BLDG HVAC TRAIN A	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)
	DG 1A-A	SYSTEM ABNORMAL
	FCO-31-6	LOSS OF POWER
	FCO-31-8	LOSS OF POWER
	HS-31-6A	NOT A-AUTO
	HS-31-8A	NOT A-AUTO
TRAIN B	CONTROL BLDG EMERGENCY AIR CLEANUP FAN B-B	LOSS OF POWER
	CONTROL BLDG EMERGENCY PRESSURIZER FAN B-B	LOSS OF POWER
	CONTROL AIR TRAIN B	SYSTEM ABNORMAL
	CONTROL BLDG HVAC TRAIN B	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)
	DG 1B-B	SYSTEM ABNORMAL
	FCO-31-5	LOSS OF POWER
	FCO-31-7	LOSS OF POWER
	HS-31-5A	NOT A-AUTO
	HS-31-7A	NOT A-AUTO

CONTROL AIR SYSTEM

TRAIN A	AUXILIARY CONTROL AIR TRAIN A	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)
	AUXILIARY AIR COMPRESSOR A-A	LOSS OF POWER
	DG 2A-A	SYSTEM ABNORMAL
	HS-32-60	OFF

WATTS BAR NUCLEAR PLANT UNIT 1
BYPASSED AND INOPERABLE STATUS INDICATION (BISI) LOGIC

TRAIN	DEVICE	CONDITION MONITORED
TRAIN B	AUXILIARY CONTROL AIR TRAIN B	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)
	AUXILIARY AIR COMPRESSOR B-B	LOSS OF POWER
	DG 2B-B	SYSTEM ABNORMAL
	HS-32-86	OFF

CHEMICAL VOLUME AND CONTROL SYSTEM (CVCS)

TRAIN A	CENTRIFUGAL CHARGING PUMP A-A	LOSS OF POWER
	CVCS TRAIN A	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)
	DG 1A-A	SYSTEM ABNORMAL
	FCV-62-90	LOSS OF POWER
	HS-62-108A	IN PULL TO LOCK
	LCV-62-132	LOSS OF POWER
	FCV-62-135	LOSS OF POWER
	RESIDUAL HEAT REMOVAL (RHR) TRAIN A	SYSTEM ABNORMAL
TRAIN B	CENTRIFUGAL CHARGING PUMP B-B	LOSS OF POWER
	CVCS TRAIN B	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)
	DG 1B-B	SYSTEM ABNORMAL
	FCV-62-91	LOSS OF POWER
	HS-62-104A	IN PULL TO LOCK
	LCV-62-133	LOSS OF POWER
	FCV-62-136	LOSS OF POWER
	RHR TRAIN B	SYSTEM ABNORMAL

SAFETY INJECTION (SI) SYSTEM

TRAIN A	DG 1A-A	SYSTEM ABNORMAL
	FCV-63-26	LOSS OF POWER
	FCV-63-72	LOSS OF POWER
	HS-63-10A	IN PULL TO LOCK
	RHR TRAIN A	SYSTEM ABNORMAL
	SI PUMP A-A	LOSS OF POWER
	SI TRAIN A	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)
TRAIN B	DG 1B-B	SYSTEM ABNORMAL
	FCV-63-25	LOSS OF POWER
	FCV-63-73	LOSS OF POWER
	HS-63-15A	IN PULL TO LOCK
	RHR TRAIN B	SYSTEM ABNORMAL
	SI PUMP B-B	LOSS OF POWER
	SI TRAIN B	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)

WATTS BAR NUCLEAR PLANT UNIT 1
BYPASSED AND INOPERABLE STATUS INDICATION (BISI) LOGIC

TRAIN	DEVICE	CONDITION MONITORED
EMERGENCY GAS TREATMENT SYSTEM (EGTS)		
TRAIN A	CONTROL AIR TRAIN A	SYSTEM ABNORMAL
	DG 1A-A	SYSTEM ABNORMAL
	EGTS FAN A-A TRAIN A	LOSS OF POWER
	EGTS TRAIN A	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)
	FCV-65-24	LOSS OF POWER
	FCV-65-10	LOSS OF CONTROL POWER
	FCO-65-26	LOSS OF CONTROL POWER
	HS-65-10	IN CLOSE
	HS-65-26	IN CLOSE
	HS-65-81	IN CLOSE
	PCV-65-81	LOSS OF CONTROL POWER
	PCV-65-86	LOSS OF CONTROL POWER
TRAIN B	CONTROL AIR TRAIN B	SYSTEM ABNORMAL
	DG 1B-B	SYSTEM ABNORMAL
	EGTS FAN B-B	LOSS OF POWER
	EGTS TRAIN B	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)
	FCV-65-43	LOSS OF POWER
	FCO-65-27	LOSS OF CONTROL POWER
	FCV-65-30	LOSS OF CONTROL POWER
	HS-65-27	IN CLOSE
	HS-65-30	IN CLOSE
	HS-65-83	IN CLOSE
	PCV-65-83	LOSS OF CONTROL POWER
	PCV-65-87	LOSS OF CONTROL POWER
ESSENTIAL RAW COOLING WATER SYSTEM (ERCW)		
TRAIN A	DG 1A-A	SYSTEM ABNORMAL
	DG 2A-A	SYSTEM ABNORMAL
	ERCW PUMP A-A	LOSS OF POWER
	ERCW PUMP B-A	LOSS OF POWER
	ERCW PUMP C-A	LOSS OF POWER
	ERCW PUMP D-A	LOSS OF POWER
	HS-67-28A	IN PULL TO LOCK
	HS-67-32A	IN PULL TO LOCK
	HS-67-36A	IN PULL TO LOCK
	HS-67-40A	IN PULL TO LOCK
	ERCW TRAIN A	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)

WATTS BAR NUCLEAR PLANT UNIT 1
BYPASSED AND INOPERABLE STATUS INDICATION (BISI) LOGIC

TRAIN	DEVICE	CONDITION MONITORED
TRAIN B	DG 1B-B	SYSTEM ABNORMAL
	DG 2B-B	SYSTEM ABNORMAL
	ERCW PUMP E-B	LOSS OF POWER
	ERCW PUMP F-B	LOSS OF POWER
	ERCW PUMP G-B	LOSS OF POWER
	ERCW PUMP H-B	LOSS OF POWER
	ERCW TRAIN B	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)
	FCV-67-152	LOSS OF POWER
	HS-67-47A	IN PULL TO LOCK
	HS-67-51A	IN PULL TO LOCK
	HS-67-55A	IN PULL TO LOCK
	HS-67-59A	IN PULL TO LOCK
COMPONENT COOLING WATER SYSTEM (CCS)		
TRAIN 2B	CCS PUMP C-S	LOSS OF POWER
	2-HS-70-51A	IN PULL TO LOCK
	DG-2B-B	SYSTEM ABNORMAL
TRAIN A	CCS PUMP A-A	LOSS OF POWER
	CCS TRAIN A	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)
	DG 1A-A	SYSTEM ABNORMAL
	HS-70-46A	IN PULL TO LOCK
	CCS PUMP C-S	LOSS OF POWER
	1-HS-70-51A	IN PULL TO LOCK
	FCV-70-139	LOSS OF POWER
TRAIN B	CCS PUMP B-B	LOSS OF POWER
	CCS TRAIN B	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)
	DG 1B-B	SYSTEM ABNORMAL
	HS-70-38A	IN PULL TO LOCK
CONTAINMENT SPRAY SYSTEM		
TRAIN A	CONTAINMENT SPRAY PUMP A-A	LOSS OF POWER
	CONTAINMENT SPRAY TRAIN A	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)
	DG 1A-A	SYSTEM ABNORMAL
	FCV-72-39	LOSS OF POWER
	HS-72-27A	IN PULL TO LOCK
TRAIN B	CONTAINMENT SPRAY PUMP B-B	LOSS OF POWER
	CONTAINMENT SPRAY TRAIN B	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)
	DG 1B-B	SYSTEM ABNORMAL
	FCV-72-2	LOSS OF POWER
	HS-72-10A	IN PULL TO LOCK

WATTS BAR NUCLEAR PLANT UNIT 1
BYPASSED AND INOPERABLE STATUS INDICATION (BISI) LOGIC

TRAIN	DEVICE	CONDITION MONITORED
RESIDUAL HEAT REMOVAL SYSTEM (RHR)		
TRAIN A	DG 1A-A	SYSTEM ABNORAL
	HS-74-10A	IN PULL TO LOCK
	RHR TRAIN A	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)
	RHR PUMP A-A	LOSS OF POWER
TRAIN B	DG 1B-B	SYSTEM ABNORAL
	HS-74-20A	IN PULL TO LOCK
	RHR TRAIN B	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)
	RHR PUMP B-B	LOSS OF POWER
STANDBY DIESEL GENERATOR (DG) SYSTEM		
TRAIN 1A	DG 1A-A AUTO START	NOT READY
	DG 1A-A STARTING AIR PRESSURE	LOW
	DG 1A-A	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)
TRAIN 1B	DG 1B-B AUTO START	NOT READY
	DG 1B-B STARTING AIR PRESSURE	LOW
	DG 1B-B	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)
TRAIN 2A	DG 2A-A AUTO START	NOT READY
	DG 2A-A STARTING AIR PRESSURE	LOW
	DG 2A-A	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)
TRAIN 2B	DG 2B-B AUTO START	NOT READY
	DG 2B-B STARTING AIR PRESSURE	LOW
	DG 2B-B	SYSTEM BYPASSED OR INOPERABLE (MANUAL ENTRY)

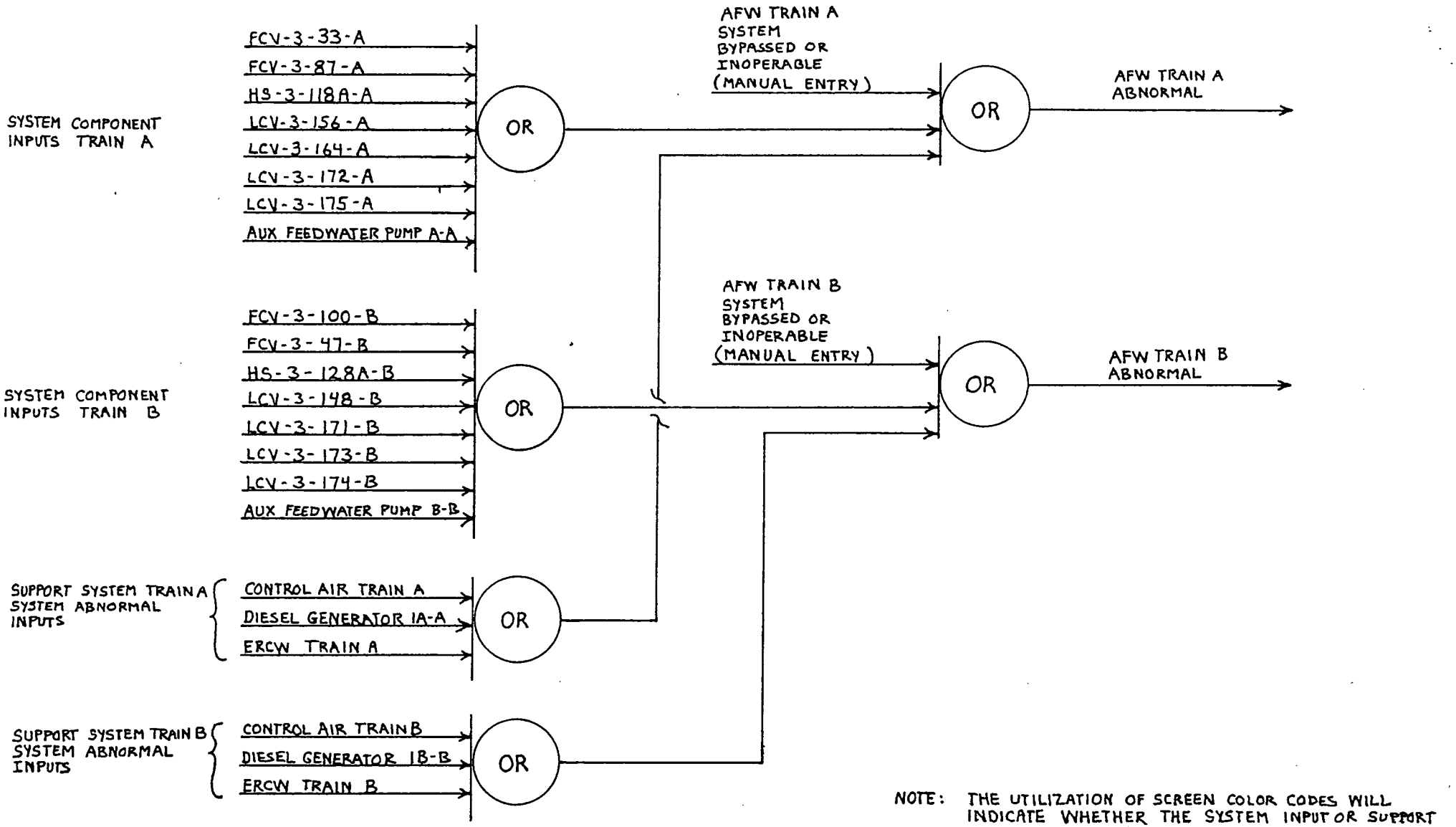

FIGURE 1
SAMPLE LOGIC TREE FOR
AUXILIARY FEED WATER SYSTEM