

ENCLOSURE

SEQUOYAH NUCLEAR PLANT
PROPOSED TECHNICAL SPECIFICATIONS

TVA-SQN-TS-36

CHANGE NO. 5

ADDITION OF SECOND LEVEL OF UNDERVOLTAGE PROTECTION

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TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
7. LOSS OF POWER					
a. 6.9 kv Shutdown Board —Loss of Voltage					
1. Start Diesel Generators	2/shutdown board	1 loss of voltage on any shutdown board	2/shutdown board	1, 2, 3, 4	20*
2. Load Shedding	2/shutdown board	1/shutdown board	2/shutdown board	1, 2, 3, 4	20*
b. 6.9 kv Shutdown Board Degraded Voltage					
1. Voltage Sensors	3/shutdown board	2/shutdown board	2/shutdown board	1, 2, 3, 4	20*
2. Diesel Generator Start and Load Shedding Timer	2/shutdown board	1/shutdown board	1/shutdown board	1, 2, 3, 4	20*
3. SI/Degraded Voltage Enable Timer	2/shutdown board	1/shutdown board	1/shutdown board	1, 2, 3, 4	20*
8. ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INTERLOCKS					
a. Pressurizer Pressure - Not P-11	3	2	2	1, 2, 3	22a
b. T_{avg} - P-12	4	2	3	1, 2, 3	22b
c. Steam Generator Level P-14	3/loop	2/loop, any loop	3/loop	1, 2	22c

NOTE: This technical specification to be implemented at the startup following the next refueling outage or following completion of the

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
9. AUTOMATIC SWITCHOVER TO CONTAINMENT SUMP					
A. RWST Level - Low COINCIDENT WITH Containment Sump Level - High	4	2	3	1, 2, 3, 4	18
AND Safety Injection	4	2	3	1, 2, 3, 4	18
(See 1 above for Safety Injection Requirements)					

Note: Manual switchover of RHR pump suction from the RWST to containment sump will be employed until containment sump level indicators are returned OPERABLE. Automatic switchover is not required OPERABLE during the interim. This note will remain in effect for a period not to exceed 30 days (July 18, 1982).

NOTE: This technical specification to be implemented at the startup following the next refueling outage or following completion of the modification, whichever is earlier.

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
6. AUXILIARY FEEDWATER		
a. Manual	Not Applicable	Not Applicable
b. Automatic Actuation Logic	Not Applicable	Not Applicable
c. Main Steam Generator Water Level-low-low	> 21% of narrow range instrument span each steam generator	> 20% of narrow range instrument span each steam generator
d. S.I.	See 1 above (all SI Setpoints)	
e. Station Blackout	0 volts with a 5.0 second time delay	0 volts with a 5.0 ± 1.0 second time delay
f. Trip of Main Feedwater Pumps	N.A.	N.A.
g. Auxiliary Feedwater Suction Pressure-Low	> 2 psig (motor driven pump) > 6.5 psig (turbine driven pump)	> 1 psig (motor driven pump) > 5.5 psig (turbine driven pump)
7. LOSS OF POWER		
a. 6.9 kv Shutdown Board Undervoltage- Loss of Voltage		
1. Start of Diesel Generators		
a. Nominal Voltage Setpoint	4860 volts	4860 volts \pm 97.2 volts
b. Relay Response Time for Loss of Voltage	0 volts with a 1.5 second time delay	0 volts with a 1.5 ± 0.5 second time delay
2. Load Shedding		
a. Nominal Voltage Setpoint	4860 volts	4860 volts \pm 97.2 volts
b. Relay Response Time for Loss of Voltage	0 volts with a 5.0 second time delay	0 volts with a 5.0 ± 1.0 second time delay

NOTE: This technical specification to be implemented at the startup following the next refueling outage or following completion of the modification, whichever is earlier.

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

<u>FUNCTIONAL UNIT</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUES</u>
b. 6.9 kv Shutdown Board- Degraded Voltage		
1. Voltage Sensors	6560 volts	6560 volts \pm 33 volts
2. Diesel Generator Start and Load Shed Timer	300 seconds	300 seconds \pm 15 seconds
3. SI/Degraded Voltage Logic Enable Timer	10 seconds	10 seconds \pm 0.5 seconds
8. ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INTERLOCKS		
a. Pressurizer Pressure Manual Block of Safety Injection P-11 \leq 1970 psig		\leq 1980 psig

NOTE: This technical specification to be implemented at the startup following the next refueling outage or following completion of the modification, whichever is earlier.

TABLE 3.3-5 (Continued)

ENGINEERED SAFETY FEATURES RESPONSE TIMES

<u>INITIATING SIGNAL AND FUNCTION</u>	<u>RESPONSE TIME IN SECONDS</u>
10. <u>Station Blackout</u>	
a. Auxiliary Feedwater Pumps	≤ 60
11. <u>Trip of Main Feedwater Pumps</u>	
a. Auxiliary Feedwater Pumps	≤ 60
12. <u>Loss of Power</u>	
a. 6.9 kv Shutdown Board - Degraded Voltage or Loss of Voltage	$\leq 10^{(10)}$
13. <u>RWST Level-Low Coincident with Containment Sump Level-High and Safety Injection</u>	
a. Automatic Switchover to Containment Sump	≤ 250
14. <u>Containment Purge Air Exhaust Radioactivity - High</u>	
a. Containment Ventilation Isolation	$\leq 10^{(6)}$
15. <u>Containment Gas Monitor Radioactivity High</u>	
a. Containment Ventilation Isolation	$\leq 10^{(6)}$
16. <u>Containment Particulate Activity High</u>	
a. Containment Ventilation Isolation	$\leq 10^{(6)}$

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NOTE: This technical specification to be implemented at the startup following the next refueling outage or following completion of the modification, whichever is earlier.

INSTRUMENTATION

TABLE 3.3-5 (Continued)

TABLE NOTATION

- (1) Diesel generator starting and sequence loading delays included. Response time limit includes opening of valves to establish SI path and attainment of discharge pressure for centrifugal charging pumps, SI and RHR pumps.
- (2) Using air operated valve
- (3) Valve FCV-70-143 is an exception to the response time shown in the table and will have the following values in seconds for the initiating signal and function indicated.
 - 2.d. 61⁽⁸⁾/71⁽⁹⁾
 - 3.d. 62⁽⁸⁾
 - 4.d. 61⁽⁸⁾/71⁽⁹⁾
 - 5.d. 64⁽⁸⁾/74⁽⁹⁾
 - 6.d. 61⁽⁸⁾/71⁽⁹⁾
- (4) On 2/3 any Steam Generator
- (5) On 2/3 in 2/4 Steam Generator
- (6) Radiation detectors for Containment Ventilation Isolation may be excluded from Response Time Testing.
- (7) Diesel generator starting and sequence loading delays not included. Offsite power available. Response time limit includes opening of valves to establish SI path and attainment of discharge pressure for centrifugal charging pumps.
- (8) Diesel generator starting and sequence loading delays not included. Response time limit includes operating time of valves.
- (9) Diesel generator starting and sequence loading delays included. Response time limit includes operating time of valves.
- (10) The response time for loss of voltage is measured from the time voltage is lost until the time full voltage is restored by the diesel. The response time for degraded voltage is measured from the time the load shedding signal is generated, either from the degraded voltage or the SI enable timer, to the time full voltage is restored by the diesel. The response time of the timers are covered by the requirements on their setpoints.

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
c. Main Steam Generator Water Level-Low-Low	S	R	M	1, 2, 3
d. S.I.	See 1 above (all SI surveillance requirements)			
e. Station Blackout	N.A.	R	N.A.	1, 2, 3
f. Trip of Main Feedwater Pumps	N.A.	N.A.	R	1, 2
g. Auxiliary Feedwater Suction Pressure - Low	N.A.	R	M	1, 2, 3
7. LOSS OF POWER				
a. 6.9 kv Shutdown Board - Loss of Voltage				
1. Start Diesel Generators	S	R	M	1, 2, 3, 4
2. Load Shedding,	S	R	N.A.	1, 2, 3, 4
b. 6.9 kv Shutdown Board - Degraded Voltage				
1. Voltage sensors	S	R	M	1, 2, 3, 4
2. Diesel Generators Start and Load Shedding Timer	N.A.	R	N.A.	1, 2, 3, 4
3. SI/Degraded Voltage Logic Timer	N.A.	R	N.A.	1, 2, 3, 4

NOTE: This technical specification to be implemented at the startup following the next refueling outage or following completion of the modification, whichever is earlier.

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>MODES IN WHICH SURVEILLANCE REQUIRED</u>
8. ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INTERLOCKS				
a. Pressurizer Pressure, P-11	N.A.	R (4)	N.A.	1, 2, 3
b. T _{avg} , P-12	N.A.	R (4)	N.A.	1, 2, 3
c. Steam Generator Level, P-14	N.A.	R (4)	N.A.	1, 2
9. AUTOMATIC SWITCHOVER TO CONTAINMENT SUMP				
a. RSWT Level - Low	S	R	M	1, 2, 3, 4
COINCIDENT WITH				
Containment Sump Level - High	S	R	M	1, 2, 3, 4
AND				
Safety Injection				

(See 1 above for all Safety Injection Surveillance Requirements)

NOTE: This technical specification to be implemented at the startup following the next refueling outage or following completion of the modification, whichever is earlier.

Note: Manual switchover of RHR pump suction from the RWS to containment sump will be employed until containment sump level indicators are returned OPERABLE. Automatic switchover is not required OPERABLE during the interim. This note will remain in effect for a period not to exceed 30 days (July 18, 1982).

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SURVEILLANCE REQUIREMENTS (Continued)

- d. At least once per 18 months by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated emergency loads for 2 hours when the battery is subjected to a battery service test.
- e. At least once per 60 months by verifying that the battery capacity is at least 82% of the manufacturer's rating when subjected to a performance discharge test. Once per 60 month interval, this performance discharge test may be performed in lieu of the battery service test.
- f. Annual performance discharge tests of battery capacity shall be given to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. Degradation is indicated when the battery capacity drops more than 10% of rated capacity from its average on previous performance tests, or is below 90% of the manufacturer's rating.

NOTE: This technical specification to be implemented at the startup following the next refueling outage or following completion of the modification, whichever is earlier.

NOTE: This technical specification is to be implemented during the startup following the next refueling outage.

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
7. LOSS OF POWER					
a. 6.9 kv Shutdown Board — Loss of Voltage					
1. Start Diesel Generators	2/shutdown board	1 loss of voltage on any shutdown board	2/shutdown board	1, 2, 3, 4	20*
2. Load Shedding	2/shutdown board	1/shutdown board	2/shutdown board	1, 2, 3, 4	20*
b. 6.9 kv Shutdown Board — Degraded Voltage					
1. Voltage Sensors	3/shutdown board	2/shutdown board	2/shutdown board	1, 2, 3, 4	20*
2. Diesel Generator Start and Load Shedding Timer	2/shutdown board	1/shutdown board	1/shutdown board	1, 2, 3, 4	20*
3. SI/Degraded Voltage Enable Timer	2/shutdown board	1/shutdown board	1/shutdown board	1, 2, 3, 4	20*
8. ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INTERLOCKS					
a. Pressurizer Pressure - Not P-11	3	2	2	1, 2, 3	22a
b. T_{avg} - P-12	4	2	3	1, 2, 3	22b
c. Steam Generator Level P-14	3/loop	2/loop any loop	3/loop	1, 2	22c

NOTE: This technical specification is to be implemented during the startup following the next refueling outage.

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TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
9. AUTOMATIC SWITCHOVER TO CONTAINMENT SUMP					
A. RWST Level - Low COINCIDENT WITH Containment Sump Level - High AND Safety Injection	4	2	3	1, 2, 3, 4	18
	4	2	3	1, 2, 3, 4	18
	(See 1 above for Safety Injection Requirements)				

Note: Manual switchover of RHR pump suction from the RWST to containment sump will be employed until containment sump level indicators are returned OPERABLE. Automatic switchover is not required OPERABLE during the interim. This note will remain in effect for a period not to exceed 30 days (July 18, 1982).

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
6. AUXILIARY FEEDWATER		
a. Manual	Not Applicable	Not Applicable
b. Automatic Actuation Logic	Not Applicable	Not Applicable
c. Main Steam Generator Water Level-low-low	> 21% of narrow range Instrument span each steam generator	> 20% of narrow range Instrument span each steam generator
d. S.I.	See 1 above (all SI Setpoints)	
e. Station Blackout	0 volts with a 5.0 second time delay	0 volts with a 5.0 \pm 1.0 second time delay
f. Trip of Main Feedwater Pumps	N.A.	N.A.
g. Auxiliary Feedwater Suction Pressure-Low	> 2 psig (motor driven pump) \geq 6.5 psig (turbine driven pump)	> 1 psig (motor driven pump) \geq 5.5 psig (turbine driven pump)
7. LOSS OF POWER		
a. 6.9 kv Shutdown Board Loss of Voltage		
1. Start of Diesel Generators		
a. Nominal Voltage Setpoint	4860 volts	4860 volts \pm 97.2 volts
b. Relay Response Time for Loss of Voltage	0 volts with a 1.5 second time delay	0 volts with a 1.5 \pm 0.5 second time delay
2. Load Shedding		
a. Nominal Voltage Setpoint	4860 volts	4860 volts \pm 97.2 volts
b. Relay Response Time for Loss of Voltage	0 volts with a 5.0 second time delay	0 volts with a 5.0 \pm 1.0 second time delay

NOTE: This technical specification is to be implemented during the startup following the next refueling outage.

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
b. 6.9 kv Shutdown Board- Degraded Voltage		
1. Voltage Sensors	6560 volts	6560 volts \pm 33 volts
2. Diesel Generator Start and Load Shed Timer	300 seconds	300 seconds \pm 15 seconds
3. SI/Degraded Voltage Logic Enable Timer	10 seconds	10 seconds \pm 0.5 seconds
8. ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INTERLOCKS		
a. Pressurizer Pressure Manual Block of Safety Injection P-11 \leq 1970 psig		\leq 1980 psig

NOTE: This technical specification is to be implemented during the startup following the next refueling outage.

TABLE 3.3-5 (Continued)

ENGINEERED SAFETY FEATURES RESPONSE TIMES

<u>INITIATING SIGNAL AND FUNCTION</u>	<u>RESPONSE TIME IN SECONDS</u>
10. <u>Station Blackout</u>	
a. Auxiliary Feedwater Pumps	≤ 60
11. <u>Trip of Main Feedwater Pumps</u>	
a. Auxiliary Feedwater Pumps	≤ 60
12. <u>Loss of Power</u>	
a. 6.9 kv Shutdown Board - Degraded Voltage or Loss of Voltage	$\leq 10^{(10)}$
13. <u>RWST Level-Low Coincident with Containment Sump Level-High and Safety Injection</u>	
a. Automatic Switchover to Containment Sump	≤ 250
14. <u>Containment Purge Air Exhaust Radioactivity - High</u>	
a. Containment Ventilation Isolation	$\leq 10^{(6)}$
15. <u>Containment Gas Monitor Radioactivity High</u>	
a. Containment Ventilation Isolation	$\leq 10^{(6)}$
16. <u>Containment Particulate Activity High</u>	
a. Containment Ventilation Isolation	$\leq 10^{(6)}$

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NOTE: This technical specification is to be implemented during the startup following the next refueling outage.

INSTRUMENTATION

TABLE 3.3-5 (Continued)

TABLE NOTATION

- (1) Diesel generator starting and sequence loading delays included. Response time limit includes opening of valves to establish SI path and attainment of discharge pressure for centrifugal charging pumps, SI and RHR pumps.
- (2) Using air operated valve
- (3) Valve FCV-70-143 is an exception to the response time shown in the table and will have the following values in seconds for the initiating signal and function indicated.
 - 2.d. 61⁽⁸⁾/71⁽⁹⁾
 - 3.d. 62⁽⁸⁾
 - 4.d. 61⁽⁸⁾/71⁽⁹⁾
 - 5.d. 64⁽⁸⁾/74⁽⁹⁾
 - 6.d. 61⁽⁸⁾/71⁽⁹⁾
- (4) On 2/3 any Steam Generator
- (5) On 2/3 in 2/4 Steam Generator
- (6) Radiation detectors for Containment Ventilation Isolation may be excluded from Response Time Testing.
- (7) Diesel generator starting and sequence loading delays not included. Offsite power available. Response time limit includes opening of valves to establish SI path and attainment of discharge pressure for centrifugal charging pumps.
- (8) Diesel generator starting and sequence loading delays not included. Response time limit includes operating time of valves.
- (9) Diesel generator starting and sequence loading delays included. Response time limit includes operating time of valves.
- (10) The response time for loss of voltage is measured from the time voltage is lost until the time full voltage is restored by the diesel. The response time for degraded voltage is measured from the time the load shedding signal is generated, either from the degraded voltage or the SI enable timer, to the time full voltage is restored by the diesel. The response time of the timers are covered by the requirements on their setpoints.

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>MODES IN WHICH SURVEILLANCE REQUIRED</u>
c. Main Steam Generator Water Level-Low-Low	S	R	M	1, 2, 3
d. S.I.	See 1 above (all SI surveillance requirements)			
e. Station Blackout	N.A.	R	N.A.	1, 2, 3
f. Trip of Main Feedwater Pumps	N.A.	N.A.	R	1, 2
g. Auxiliary Feedwater Suction Pressure - Low	N.A.	R	M	1, 2, 3
7. LOSS OF POWER				
a. 6.9 kv Shutdown Board - Loss of Voltage				
1. Start Diesel Generators	S	R	M	1, 2, 3, 4
2. Load Shedding	S	R	N.A.	1, 2, 3, 4
b. 6.9 kv Shutdown Board - Degraded Voltage				
1. Voltage sensors	S	R	M	1, 2, 3, 4
2. Diesel Generators Start and Load Shedding Timer	N.A.	R	N.A.	1, 2, 3, 4
3. SI/Degraded Voltage Logic Timer	N.A.	R	N.A.	1, 2, 3, 4

NOTE: This technical specification is to be implemented during the startup following the next refueling outage.

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>MODES IN WHICH SURVEILLANCE REQUIRED</u>
8. ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INTERLOCKS				
a. Pressurizer Pressure, P-11	N.A.	R (4)	N.A.	1, 2, 3
b. T _{avg} , P-12	N.A.	R (4)	N.A.	1, 2, 3
c. Steam Generator Level, P-14	N.A.	R (4)	N.A.	1, 2
9. AUTOMATIC SWITCHOVER TO CONTAINMENT SUMP				
a. RSWT Level - Low	S	R	M	1, 2, 3, 4
COINCIDENT WITH Containment Sump Level - High	S	R	M	1, 2, 3, 4
AND Safety Injection				
(See 1 above for all Safety Injection Surveillance Requirements)				

NOTE: This technical specification is to be implemented during the startup following the next refueling outage.

Note: Manual switchover of RHR pump suction from the RWST to containment sump will be employed until containment sump level indicators are returned OPERABLE. Automatic switchover is not required OPERABLE during the interim. This note will remain in effect for a period not to exceed 30 days (July 18, 1982).

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- d. At least once per 18 months by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated emergency loads for 2 hours when the battery is subjected to a battery service test.
- e. At least once per 60 months by verifying that the battery capacity is at least 82% of the manufacturer's rating when subjected to a performance discharge test. Once per 60 month interval, this performance discharge test may be performed in lieu of the battery service test.
- f. Annual performance discharge tests of battery capacity shall be given to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. Degradation is indicated when the battery capacity drops more than 10% of rated capacity from its average on previous performance tests, or is below 90% of the manufacturer's rating.

NOTE: This technical specification is to be implemented during the startup following the next refueling outage.