TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
ii. RCS Loop ΔT Equivalent to Power > 50% RTP		
Coincident with Steam Generator Water Level--Low-Low (Adverse)	≥15.0% of narrow range instrument span	≥14.4% of narrow range instrument span
and		
Containment Pressure (EAM)	≤0.5 psig	≤0.6 psig
or		
Steam Generator Water Level--Low-Low (EAM)	≥10.7% of narrow range instrument span	≥10.1% of narrow range instrument span
d. S.I.	See 1 above (all SI Setpoints)	
e. Loss of Power Start		
1. Voltage Sensors	≥5520 volts	≥5331 ~~5472~~ volts
2. Load Shed Timer	1.25 seconds	1.25 ±0.~~09~~ .25 seconds
f. Trip of Main Feedwater Pumps	N.A.	N.A.
g. Auxiliary Feedwater Suction Pressure-Low	≥ 2 psig (motor driven pump) ≥ 13.9 psig (turbine driven pump)	≥ 1 psig (motor driven pump) ≥ 12 psig (turbine driven pump)
h. Auxiliary Feedwater Suction Transfer Time Delays	4 seconds (motor driven pump)	4 seconds ±0.4 seconds (motor driven pump)
	5.5 seconds (turbine driven pump)	5.5 seconds ±0.55 seconds (turbine driven pump)

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TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
7. LOSS OF POWER		
a. 6.9 kv Shutdown Board Undervoltage		
Loss of Voltage		
1. Voltage Sensors	≥5520 volts	≥ ~~5472~~ 5531 volts
2. Diesel Generator Start and Load Shed Timer	1.25 seconds	1.25 ± ~~0.05~~ 0.25 seconds
b. 6.9 kv Shutdown Board-Degraded Voltage		
1. Voltage Sensors	6456 volts	>6403.5 volts (dropout) ~~≤6626.5~~ 6595.5 volts (reset)
2. Diesel Generator Start and Load Shed Timer	≤300 seconds	≤ ~~321~~ 370 seconds
3. SI/Degraded Voltage Logic Enable Timer	~~10~~ 9.5 seconds	~~10 seconds ± 0.75~~ 9.5 ± 2.0 seconds
8. ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INTERLOCKS		
a. Pressurizer Pressure		
1. Not P-11, Automatic Unblock of Safety Injection on Increasing Pressure	≤ 1970 psig	≤ 1975.2 psig
2. P-11, Enable Manual Block of Safety Injection on Decreasing Pressure	≥ 1962 psig	≥ 1956.8 psig

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
ii. RCS Loop ΔT Equivalent to Power > 50% RTP		
Coincident with Steam Generator Water Level--Low-Low (Adverse)	≥15.0% of narrow range instrument span	≥14.4% of narrow range instrument span
and		
Containment Pressure (EAM)	≤0.5 psig	≤0.6 psig
or		
Steam Generator Water Level--Low-Low (EAM)	≥10.7% of narrow range instrument span	≥10.1% of narrow range instrument span
d. S.I.	See 1 above (all SI Setpoints)	
e. Loss of Power Start		
1. Voltage Sensors	≥5520 volts	≥5331 ~~5472~~ volts
2. Load Shed Timer	1.25 seconds	1.25 ±0.25 ~~0.09~~ seconds
f. Trip of Main Feedwater Pumps	N.A.	N.A.
g. Auxiliary Feedwater Suction Pressure-Low	≥ 2 psig (motor driven pump) ≥ 13.9 psig (turbine driven pump)	≥ 1 psig (motor driven pump) ≥ 12 psig (turbine driven pump)
h. Auxiliary Feedwater Suction Transfer Time Delays	4 seconds (motor driven pump)	4 seconds ±0.4 seconds (motor driven pump)
	5.5 seconds (turbine driven pump)	5.5 seconds ±0.55 seconds (turbine driven pump)

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
7. LOSS OF POWER		
a. 6.9 kv Shutdown Board Undervoltage Loss of Voltage		
1. Voltage Sensors	≥5520 volts	≥~~5472~~ 5331 volts
2. Diesel Generator Start and Load Shed Timer	1.25 seconds	1.25 ±~~0.09~~ 0.25 seconds
b. 6.9 kv Shutdown Board-Degraded Voltage		
1. Voltage Sensors	6456 volts	>6403.5 volts (dropout) ~~≤6626.5~~ ≤6595.5 volts (reset)
2. Diesel Generator Start and Load Shed Timer	≤300 seconds	≤~~321~~ 370 seconds
3. SI/Degraded Voltage Logic Enable Timer	~~10~~ 9.5 seconds	~~10 seconds~~ 9.5 ± ~~0.75~~ 2.0 seconds
8. ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INTERLOCKS		
a. Pressurizer Pressure		
1. Not P-11, Automatic Unblock of Safety Injection on Increasing Pressure	≤ 1970 psig	≤ 1975.2 psig
2. P-11, Enable Manual Block of Safety Injection on Decreasing Pressure	≥ 1962 psig	≥ 1956.8 psig

ENCLOSURE 2

PROPOSED TECHNICAL SPECIFICATION (TS) CHANGE

SEQUOYAH NUCLEAR PLANT (SQN) UNITS 1 AND 2

DOCKET NOS. 50-327 AND 50-328

(TVA-SQN-TS-93-09, REVISION 1)

DESCRIPTION AND JUSTIFICATION FOR

REVISED LOSS-OF-POWER INSTRUMENTATION SETPOINTS

Description of Change

TVA proposes to modify the Sequoyah Nuclear Plant (SQN) Units 1 and 2 technical specifications (TSs) to support the implementation of an enhanced loss-of-power relay design. The original changes requested by TVA are still valid; however, the revised design scheme will require a change to some of the voltage and time delay setpoints. Therefore, the changes requested by TVA in a letter to NRC dated October 1, 1993, and approved by NRC on May 24, 1994, remain unchanged with the exception of the following trip setpoint and allowable value proposed revisions:

- Item 6.e of TS Table 3.3-4 allowable values for the voltage sensor and timer would be revised. The allowable value for the voltage sensor will be changed to $\geq$5331 volts. The allowable value for the diesel generator (D/G) start and load shed timer will be changed to 1.25 $\pm$0.25 seconds.

- Item 7.a of TS Table 3.3-4 allowable values for the voltage sensor and timer would be revised. The allowable value for the voltage sensor will be changed to $\geq$5331 volts. The allowable value for the D/G start and load shed timer will be changed to 1.25 $\pm$0.25 seconds.

- Item 7.b of TS Table 3.3-4 trip setpoint and allowable values for the voltage sensor and timers would be revised. The allowable value for the voltage sensor reset will be changed to $\leq$6595.5 volt. The allowable value for the D/G start and load-shed timer will be changed to $\leq$370 seconds. The trip setpoint for safety injection (SI)/degraded voltage logic enable timer will be changed to 9.5 seconds. The allowable value for the D/G degraded voltage logic enable timer will be changed to 9.5 $\pm$2.0 seconds.

Reason for Change

The reason for the proposed loss-of-power voltage scheme has not changed from the original request. The revisions to the original proposed trip setpoint and allowable values described above are being proposed for the following reasons:

- The proposed loss-of-voltage sensor allowable value revision will utilize a limit that is based upon the safety analysis limit. The original allowable value was determined based on expected instrumentation tolerances and was overly conservative with respect to the analysis limit. The use of the original allowable value could have resulted in unnecessary reporting of conditions violating the allowable value even though the safety limit was not at risk.

- The proposed loss-of-voltage timer allowable value was revised for the same reasons described for the loss-of-voltage sensor allowable value above. In addition, these timers were to be replaced with a more accurate electronic timer, but will now remain with the electro-pneumatic version. This resulted in an allowable value in the original proposal that the revised design cannot achieve because of the original dependence on the expected instrumentation capabilities instead of analysis limits. Maintaining the present electro-pneumatic timers will significantly reduce the implementation time by eliminating field work to replace the relays.

- The proposed degraded voltage sensor allowable value for reset change will agree with the latest voltage analysis performed for SQN. The SQN voltage analysis is periodically reperformed to account for plant modifications as well as changes to the offsite power system. One of these reevaluations occurred after the original request was submitted and a slight change to this allowable value resulted.

- The proposed degraded voltage D/G start and load shed timer allowable value will change for the same reasons described for the loss-of-voltage timer allowable value above.

- The proposed SI/degraded voltage logic enable timer trip setpoint change will agree with the latest accuracy calculation for these timers. These timers were set to industry guidelines when they were initially installed at SQN. Since this installation, TVA has performed accuracy calculations to enhance the function of these timers, which has resulted in a slightly lower desired setpoint value. The proposed revision reflects the latest analysis value for the SI/degraded voltage logic enable timer and provides a more conservative value for load shed initiation.

- The proposed SI/degraded voltage logic enable timer allowable value will change for the same reasons described for the loss-of-voltage timer allowable value above.

These setpoint revisions and the revised design for the voltage protection scheme are being proposed to support an implementation plan that will not adversely impact safety functions or require significant extensions to allowed outage times for TS required equipment. The revised design will reduce the wire manipulations and relay/component installations such that approximately eight or nine days of implementation time will be eliminated. The primary design changes responsible for this reduction were associated with the usage of existing relaying and the elimination of changes that only provided maintenance or testing flexibility. This revision is considered the appropriate action to maintain a reasonable level of safety during implementation and still provide the desired enhancements to the voltage protection scheme.

Justification for Changes

The design changes for the proposed voltage protection scheme, have been revised from the original submittal that was approved by NRC but not yet implemented, to minimize the impact to operating equipment and safety functions during the implementation phase. The changes to the proposed design, as described in the original TS change request, are as follows:

- The original design disabled the degraded voltage load-shedding function after the D/G was tied to the shutdown board as the sole supply. The revised design will maintain the current logic that will initiate load shedding on a degraded voltage condition only if the D/G voltage level drops below the 70 percent voltage limit of

the auxiliary relay for the emergency supply breaker or if this breaker trips. This is the current design at SQN. Actuation of the load shed logic at the 70 percent voltage level will continue to provide additional protection for safety related equipment to support their availability for accident mitigation. At this voltage level motor heating could be a problem for continued operability and allowing the D/G to reestablish its safety function through load shedding at this voltage level may enhance the long term operability requirements for some accidents. This design provides a scheme that is similar to the original proposed design that would have initiated load shedding in this situation on an 80 percent voltage level after a 10 second delay. The new design will include a 1.25 second delay prior to load shedding at the 70 percent voltage level as a result of the delay associated with the 80 percent voltage level loss-of-voltage relays. This change to the original design results in a significant reduction in wire manipulations.

- The timers utilized in this design will be of the electro-pneumatic type instead of the electronic version originally described. This applies to the degraded voltage and the loss-of-voltage timers. This is the same type of timer currently used and will not affect the associated functions. The original proposal included the electronic timers as an upgrade but was not needed to support the analysis. This change to the original design results in a reduction in wire manipulations as well as the installation and removal of relays.

- The sensing voltage for the loss-of-voltage relays will be moved to the shutdown board as originally described, however, they will actuate only one pair of timers, utilizing a one-out-of-two logic scheme, to initiate D/G start and load shedding. Therefore, no change to the D/G start and load shed function is involved with the exception of the following item for the deleted second pair of timers. This change will reduce a significant number of wire manipulations and relay relocations.

- The second pair of timers, originally designed to provide an additional 10 second time delay for loss-of-voltage conditions when the D/G is the sole supply to the shutdown board, have been removed from the voltage protection scheme. This results in the loss-of-voltage function only being functional in this configuration if the D/G voltage level drops below the 70 percent limit of the auxiliary relay for the emergency supply breaker or if this breaker trips. This is the current design at SQN. The previous discussions, in the first item of this section associated with load shedding after the D/G ties to the board, also apply to this change in the proposed design. This change will eliminate the activities required to install the additional pair of relays originally proposed.

- The allowable values and trip setpoints have been revised as discussed in the description of change section of this enclosure. These changes continue to fully support the analysis for the SQN voltage protection requirements and no reduction in the level of safety will result. These changes do not affect the implementation duration in either a positive or negative way.

The revisions to the original proposed design discussed above have not impacted the justifications for this change as presented in the original TS change request. This is based on the revised design maintaining the safety functions and logic provisions originally proposed. In addition, the analysis has been reevaluated to ensure that the instrumentation changes will continue to support the proposed setpoints and allowable values considering the revisions described earlier. The only logic that has been altered is the load shed function when the D/G is the sole power supply to the shutdown board. In this configuration, load shedding is enabled based upon the D/G breaker position or the voltage level the D/G is providing, which is the current SQN design, instead of the originally proposed 10-second time delay. This function is not a safety function for the D/G, but is considered in the design to enhance availability of the D/G, therefore, this change will not invalidate the acceptability of the proposed revisions.

Therefore, the revised design and setpoints described in this submittal will continue to provide for a voltage protection scheme that will ensure adequate voltage for accident mitigation functions. The revisions proposed in this submittal do not result in a change of the plant response for postulated accidents from those proposed in the original change request. The equipment reliability, capability, and functionality has not been adversely impacted by these revisions. By incorporating these changes the safety aspect of implementing this design will be significantly improved by reducing the time required for implementation. This will result in shorter outages of safety related components and will minimize limiting condition for operation entry time. The other TS changes proposed in the original request dated October 1, 1993, are not changed by these revisions and the original discussions are still valid. For these reasons, the revised TS change is acceptable from a nuclear-safety standpoint.

Environmental Impact Evaluation

The proposed change does not involve an unreviewed environmental question because operation of SQN Units 1 and 2 in accordance with this change would not:

1. Result in a significant increase in any adverse environmental impact previously evaluated in the Final Environmental Statement (FES) as modified by NRC's testimony to the Atomic Safety and Licensing Board, supplements to the FES, environmental impact appraisals, or decisions of the Atomic Safety and Licensing Board.

2. Result in a significant change in effluents or power levels.

3. Result in matters not previously reviewed in the licensing basis for SQN that may have a significant environmental impact.

ENCLOSURE 3

PROPOSED TECHNICAL SPECIFICATION CHANGE

SEQUOYAH NUCLEAR PLANT (SQN) UNITS 1 AND 2

DOCKET NOS. 50-327 AND 50-328

(TVA-SQN-TS-93-09, REVISION 1)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

Significant Hazards Evaluation

TVA has evaluated the proposed technical specification (TS) change and has determined that it does not represent a significant hazards consideration based on criteria established in 10 CFR 50.92(c). Operation of Sequoyah Nuclear Plant (SQN) in accordance with the proposed amendment will not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated.

   The proposed revision supports the implementation of design logic and setpoint changes to the loss-of-power relaying. This relaying is designed to ensure adequate voltage is available to safety-related loads in order to enhance their operability and support accident mitigation functions and to provide for auxiliary feedwater (AFW) pump starts. The design changes alter relay logic and delete unnecessary relaying, but do not change the diesel generator (D/G) start and load-shedding actuations that result from loss-of-power conditions. Therefore, no new actuations or functions have been created; and because the existing and proposed functions provide for accident mitigation considerations that are not the source of an accident, the probability of an accident is not increased. The deletion of the 6.9-kilovolt shutdown board normal-feeder undervoltage relays actually reduces the potential for inadvertent shutdown board blackouts as a result of short-duration voltage transients or instrument failures.

   The setpoints and time delays for loss-of-power functions have been modified based on the guidelines developed by the Electrical Distribution System Clearinghouse as evaluated and determined through detailed analysis by TVA. This design is documented in TVA Calculations SQN-EEB-MS-TI06-0008, 27DAT, and DS-1-2 and is available for NRC review at the SQN site. The assigned values are conservative settings that will ensure adequate voltage is supplied to safety-related loads for accident mitigation and safety functions under normal, degraded, and loss-of-offsite-power voltage conditions with appropriate time delays to prevent damage to electrical loads and minimize premature or unnecessary actuations. The identification of loss-of-voltage conditions is enhanced by the design changes to ensure the timely sequencing of loads onto the D/G and the initiation of AFW pump starts for accident mitigation. Because there are no reductions in safety functions resulting from the design logic, setpoint, and time-delay changes to the loss-of-power instrumentation and offsite dose levels for postulated accidents will not be increased, the consequences of an accident are not increased.

   The applicable mode addition, TS 3.0.4 exclusion deletion, and response time measurement clarification incorporated in the proposed change do not affect plant functions. These changes reflect the requirements that SQN has been

maintaining and serve to clarify the requirements to provide consistency of application and easier understanding. The AFW footnote addition and bases revision only clarify operability conditions that are consistent with the plant design for the AFW pump and loss-of-power instrumentation. Because there are no changes to plant functions or operations, these revisions have no impact on accident probabilities or consequences.

2. Create the possibility of a new or different kind of accident from any previously analyzed.

As described above, the loss-of-power instrumentation ensures adequate voltage to safety-related loads by initiating D/G starts and load shedding and provides for AFW pump starting, but is not considered to be the source of an accident. Although the design logic, setpoint, and time-delay actuation criteria have changed, the output functions to various plant systems that actuate for load shedding and D/G starts remain the same. Therefore, actuation criteria have been affected, but not safety functions, and the TVA evaluation has confirmed that the new design enhances the ability to maintain adequate voltage to support safety functions. Since safety functions have not changed and the new loss-of-power instrumentation design continues to support operability of safety-related equipment, no new or different accident is created.

The applicable mode addition, TS 3.0.4 exclusion deletion, and response time measurement clarification, as well as the AFW operability clarifications, do not affect plant functions and will not create a new accident.

3. Involve a significant reduction in a margin of safety.

The proposed loss-of-power TS changes support design logic, setpoint, and time-delay requirements that have been verified by TVA analysis to provide acceptable voltage levels for safety-related components. In determining the acceptability of these voltage levels, the minimum voltage for operation as well as detrimental component heating resulting from sustained degraded-voltage conditions were considered. This design ensures that safety-related loads will be available and operable for normal and accident plant conditions. The applicable mode addition, TS 3.0.4 exclusion deletion, response time measurement clarification, and AFW operability clarifications provide enhancements to TS requirements and do not affect plant functions. Therefore, no safety functions are reduced by these changes and there is no reduction in the margin of safety.