EVALUATION OF ELECTRICAL RESTART CALCULATIONS REVIEW SEQUOYAH UNITS 1 AND 2

BACKGROUND

As a result of deficiencies first identified to TVA by the Institute of Nuclear Power Operations (INPO) in its audit on the Bellefonte and Watts Bar nuclear plants and later confirmed by TVA during the Bellefonte electrical evaluation and quality assurance audit, the staff was concerned about the adequacy of the electrical system design of the Sequoyah Nuclear Plant. Because of this concern, TVA reviewed the design calculations at Sequoyah and found several deficiencies. The deficiencies identified at Sequoyah were as follows:

1. Minimum set of electrical calculations required to support the design for TVA's nuclear plants was not available,

2. Procedures controlling design changes were not fully adhered to,

3. Existing calculations were not considered when design changes were made, and

4. Existing calculations that did not require change were not formally documented.

TVA believes that the majority of calculations required for the design were prepared informally during the design period. As a result, calculations were not officially documented or controlled, and those that were documented were not kept up-to-date.

To correct the above deficiencies, TVA has reviewed all the existing electrical calculations. Further, to ensure that the design for Sequoyah meets all requirements for safe startup and operation, and to document the adequacy of plant electrical system design, an electrical calculations program was established. This program consists of performing electrical calculations, establishing design control procedures and a design change review program. Moreover, Sargent & Lundy (S&L) was contracted to perform an independent assessment of TVA's electrical calculations program. This assessment was to provide additional assurance that all the electrical calculations necessary to support plant restart have been identified and are existing, current, retrievable and technically correct. In addition, S&L is working to identify any additional electrical calculations necessary to fully document the design basis of the plant.

TVA has identified a minimum set of electrical calculations which they deem necessary to be in-place and up-to-date to support the restart of Sequoyah. The minimum set of electrical system calculations are listed below:

1. Auxiliary Power System (APS)
   a. Load Analysis
   b. Voltage Calculations

c. Class 1E Motor Control Center (MCC) Control Circuit Cable Length Calculation

d. Diesel Generator Load Analysis

2. Control Power System (CPS)

   a. 125V dc Vital Instrument Power System Voltage Calculations

   b. 120V ac Vital Instrument Power System Voltage Calculations

3. Instrumentation and Control Systems (I&CS)

   Instrumentation Accuracy Calculations, Seismic Effects

4. Raceway Systems (RS)

   a. Justification for Use of TVA's Ampacity Tables

   b. Justification of TVA's Ampacity Tables as Specifically Applied to Control Level Cable Trays, Grouped Conduits, Conduits With More Than Three Cables and Duct Banks

Each system calculation is complex and requires in-depth knowledge of Sequoyah system operation. Therefore, the staff reviewed each system analysis for its overall completeness relative to the stated purpose, appropriateness of assumptions, correctness of applied methodology and reasonableness of results to assure the adequacy of electrical calculations and documentation in support of SQN restart.

On January 14-16, 1986, the staff visited the Sequoyah site to review a draft scope of the electrical system calculations and evaluate whether the scope included all pertinent onsite power system calculations necessary to support restart. Also, the staff was to assess the adequacy of calculations in regard to approach, level of detail, and documentation. Each TVA system reviewer responsible for a particular analysis was present during the visit to explain the assumptions, methodology, and sources of data. Samples of the calculations and the documentation were provided to the staff to provide any comments it may have had on the calculations.

Subsequently, on February 27, 1986, TVA submitted a report titled "Electrical Calculations Program for Sequoyah Nuclear Plant" which provided a brief discussion of the Sequoyah electrical calculations program and presented the analyses of all the systems shown on the previous list.

The report identified the following problems in the above list of systems and included them in the significant condition reports (SCRs) for required corrective action:

1.b APS/Voltage Calculations (SCR SQNEEB 8607)

1.d APS/Diesel Generator Load Analysis (SCR SQNEEB 8629/8646)

2.a CPS/125V dc Voltage Calculations (SCR SQNEEB 8605)

2.b CPS/120V ac Voltage Calculations (SCR SQNEEB 8532)

An February 27, 1986 submittal stated that additional information would be forthcoming at a later date to discuss the corrective actions taken for each SCR.

In an August 1, 1986 submittal, TVA provided its review of all the SCRs along with the corrective actions. The submittal also included an assessment by S&L of the Sequoyah electrical calculations program. Based on its review, TVA concluded that revisions to the electrical calculations and related formal documentation for the APS, I&CS, and raceways were necessary before restart.

Also, additional work was to be performed in the CPS and station grounding systems. The effort on the CPS and station grounding systems is presently underway at TVA and will be completed before restart of Sequoyah.

EVALUATION

The staff's individual evaluation of the six completed electrical calculation areas is as follows:

1. Auxiliary Power Supply Load Analysis

Prior to determining the adequacy of APS system voltages through calculations, TVA conducted an APS loading analysis for the 6.9kV unit boards and the 6.9kV and 480V Class 1E boards to account for and document the power distribution equipment loading profiles for normal operation, full-load rejection, emergency shutdown, and cold shutdown. For each operation, the latest plant as-built drawings and system functional diagrams were reviewed to determine the loads on each board. The loads were further identified as being either off, running, starting, delayed starting, or delayed tripped according to each operating mode. For the minimum load condition, at cold shutdown, the load was taken from actual measurement performed 92 hours after a normal shutdown.

The staff has reviewed the APS load analysis dated January 31, 1986 which listed all the equipment, its operating status according to its operating mode, and the load represented by the equipment. The sources of information include the single line diagrams, schematics, and design drawings. The staff finds the sources and the documentation to be complete and further find the APS loading analysis format to be appropriate for use in the voltage calculations.

Therefore, the staff concludes that the load analysis is comprehensive and sufficiently detailed to be used as the basis for board loadings for the steady-state and transient voltage calculations, and find the load analysis acceptable.

2. Auxiliary Power System Voltage Calculations

The APS voltage calculations were performed to determine and document the following:

a. Steady-state voltages at 6.9KV switchgear buses for unit startup, full-load operation, normal shutdown, and emergency shutdown with maximum and minimum unit generator/offsite power supply voltages.

b. Transient voltage profiles at all Class 1E APS buses and safety-related motor terminals for design basis conditions and minimum offsite power system voltages.

c. Optimum power transformer voltage tap settings.

d. Adequacy of present degraded voltage relay setpoint selection.

TVA used the following in-house developed basic software packages which are run on personal computers to calculate the above APS voltages (the validity of the computer software has been evaluated under the PSB-1 review and found to be acceptable for its use in the APS voltage calculations).

1) Radial was used for transient/steady state voltage calculations at all 6.9kV unit and shutdown boards interfacing with the plant from the grid.

2) Volt was used to calculate the transient voltage at each 480V Class 1E board and to sum the 480V system board loadings for use in the 6.9KV system calculations.

3) Volt 2 was used for the 480V level steady-state voltage calculations. It determined the starting and running voltage of every load for the condition of minimum source voltage and maximum bus loading.

The approach used by TVA to perform the APS voltage calculations was to develop cable and load data files based on the APS configuration, cable parameters, and loads developed in the loading analysis. The above computer programs then used these data files to calculate the APS voltages.

In order to assure that the voltages on the 6.9kV shutdown boards (Class 1E) remain within the degraded voltage setpoints (6560V - 7260V) and all 6.9kV Class 1E motors have adequate starting and running voltage, the analysis found that: 1) the acceptable range for the 161-kV grid voltage would need to be from a minimum of 159kV to a maximum of 166kV for each common station service transformer (CSST) with taps set at 0.975 (-2.5%) and 2) the main generator voltage should be limited to 24.8kV to limit the 6.9kV shutdown board voltage to 7260V during normal operation. This, in turn, sets the unit station service transformer (USST) tap at 1.025 (+2.5%). The analysis also found that the worst case scenario which resulted in the maximum load was a full load rejection (FLR) for unit 1 with a safety injection (SI) and phase B containment isolation for Unit 2. This is due to starting of the containment spray pumps (700HP) on a SI signal with phase B containment isolation.

The following tables show the voltages obtained from the APS voltage calculations.

Cases	Taps (%)	Grid Voltage (161 kV)	Worst Case Shutdown Bds (6.9kV) Voltages	
1. Max. Load (Unit 1-FLR Unit 2-SI w/phase B isolation)	CSST At -2.5%	159kV (Min.)	T=0 sec 6574V	6118V[1]
			T=10 sec 6692V	6631V
			T=2 min 6718V	6915V
2. Min. Load (Cold Shutdown)	CSST At -2.5%	166kV (Max.)	7245V	7262V
3. During Normal Operation	USST At +2.5%	Main Generator Voltage at 24.8kV	7245V	7212V

4. Sample 6.9kV Shutdown Bd Motor Voltages at U1-FLR, U2-SI, w/phase B containment isolation (worst case) 159kV, CSST at -2.5 tap

Motor	Starting Terminal Voltage P.U. (T=0)	Required Starting Voltage P.U.	(T=Steady State) Running Voltage
Aux Feedwater Pump 1A	.951	.765*	.969
ERCW pump k-A	.858	"	.954
Aux Feedwater Pump 2A	.884	"	.960
Containment Spray 2A	.883	"	.960
RHR Pump 2A	.884	"	.961
Safety Injection Pump 2A	.884	"	.961
Centrifigal Charging Pump 2A	.883	"	.960
ERCW Pump Q-A	.857	-	.963
Centrifigal Charging Pump 1A	-	-	.969
Press HTR Group 1D	-	-	.97
ERCW Pump R-A	.857	.765	-

*80% rated

/1 The time delay trip setpoint for degraded grid voltage at 6.9kV shutdown Bds has been set at 10 sec with 6560V.

Based on the results of the 6.9KV plant/grid interface voltage calculations, TVA concluded that there was no need to change the degraded voltage setpoint for 6.9kV Class 1E shutdown boards and all 6.9kV Class 1E motors will have adequate starting and running voltages.

However, deficiencies (SCR - SQNEEB 8607) were found with respect to individual component voltages in the Class 1E 480V ac boards which would occur during a degraded voltage condition. The corrective actions identified by TVA were: (1) the delay of two component cooling system pumps for a period of 20 sec after receipt of a SI signal, (2) modification of the 480V ac supply to the main feedwater isolation valves such that the electrically operated brakes are wired independent of the valve's motor operator. TVA stated that the above time delay has been analyzed and found to be consistent with the plant design basis. TVA further stated that the necessary modification (ECN L6648) has been authorized. As for the main feedwater isolation valves, the resolution involves the installation of eight new cables in addition to eight new solenoid valves which will operate at 80% of voltage. These corrective actions will be completed before restart of SQN.

The staff has reviewed the corrective actions proposed by TVA and concurs with TVA that the deficiencies can be resolved by the above system changes. When TVA has included specific time delay devices to assure adequate voltage, these devices should be included in the technical specifications for operability and surveillance. Therefore, the staff finds the resolution acceptable.

Based on its review of the APS voltage calculations, the staff finds that adequate (steady-state and transient) voltage will be available at all Class 1E APS buses and motor terminals for all design basis conditions with maximum and minimum unit generator/offsite power supply voltages.

3. Class 1E Motor Control Center (MCC) Control Circuit Cable Length Calculations

To determine the ability of the Class 1E MCC control circuits to pick up the control devices (valves, starters, relays, solenoids, etc.) under the worst degraded voltage conditions, the voltage profiles to these control devices were calculated from a supply bus (480V Shutdown Board) powered from the worst case 6.9kV board (at 6118V) upon initiation of the SI. For these calculations, all Class 1E circuits fed from Class 1E MCCs were identified, reviewed, and documented considering the control power transformer sizes, starter sizes and load parameters, cable lengths and wire sizes.

The minimum control voltage value used as acceptable criteria for the majority of the starters was 93.5 volts (85% of 110V). For Allis-Chalmer starters, 102 volts (85% of 120 volts) was used. Also, to be conservative, the cable lengths used for the voltage calculations were increased by 15% over the pull lengths.

These calculations identified thirty-eight (38) circuits with control voltage less than 93.5 volts. Investigation of these circuits showed that no adverse affect will result if the energizing of these circuits is delayed for 15-30 seconds. The affected circuits with expected time delays if the degraded voltage condition remains are as follows:

a. Delaying the closing of the hydraulic injection valves (HIVs) on the upper head injection system (UHI) from 4 sec to 15-20 seconds (one circuit).

b. Delaying the starting up of various cooling and exhaust fans in auxiliary building for 30 seconds (36 circuits).

c. Delaying the opening of the diesel engine heat exchanger-inlet ERCW control valve for 30 seconds (one circuit).

The staff review of the APS voltage calculations performed for the worst degraded voltage conditions (i.e., 6118V) shows that the voltage recovers to 6631V at 10 seconds, and the trip set point for degraded grid voltage has been set at 6560V with a time delay of 10 seconds. The staff also reviewed the expected time delays for the sustained degraded voltage condition as described above. The staff finds that:

1) For the HIVs on the UHI system, the staff reviewed a recent Sandia report (TRAC-PF1/MOD 1 dated January 29, 1986) which studied the failure of the upper head accumulator shutoff valve which results in injection of nitrogen into the vessel during a design basis accident. The calculations performed in the report showed that

"because of the extra water injected into the vessel by the upper head accumulator, failure to close the upper head accumulator shutoff valve is slightly beneficial with respect to cooling the core" and concluded that "there is no significant displacement of vessel water by the incoming nitrogen and the nitrogen that does enter the core does not seriously hamper reflood." Based on this conclusion, a delay from 4 seconds to 15-25 seconas on the upper head accumulator shutoff valve with respect to injection of nitrogen into the core is not safety significant and is therefore acceptable.

2) Delaying the starting of the cooling and exhaust fans in auxiliary building by 30 seconds does not adversely affect the safety-related equipment in the rooms.

3) The diesel generator engine is capable of starting and running from a standby condition for a period of 30 seconds without ERCW water flowing to the heat exchanger without the engine overheating.

Based on our review of the Class 1E MCC control circuit cable length calculations, the staff concurs with TVA that the Class 1E MCC control circuits can pick up the control devices under degraded voltage conditions. Furthermore, the staff finds that the delay times evaluated by TVA for the above components do not represent safety concerns and are, therefore, acceptable.

4. Diesel Generator (DG) Load Analysis

TVA has performed a DG load analysis to determine the sequential loading and capability of each DG to start each load at the time required within acceptable voltage and frequency limits. A computer data base was prepared showing all loads connected to the power distribution boards that would be powered by the DG following a total loss of offsite power. The data base was developed by using as designed logic and schematic drawings of the circuit operations for the various design events. All the loads on each power train were sorted and coded according to the time of start and/or stop.

TVA considered the following three possible accident conditions:

a. A total loss of offsite power (BO)

b. Blackout with safety injection (SI) signal-phase A containment isolation

c. Blackout with safety injection (SI) signal-phase B containment isolation

The loads were summed in Horsepower (HP) and Kilowatts (KW) from 0 seconds to 120 seconds for each of the four power trains for the above accidents. The worst case sequential loading for each of the above conditions was determined. Additionally, the worst case loading scenario was further analyzed and evaluated by the DG contractor (Morrison-Knudsen Company, Inc.) to determine capability to accept and carry sequenced and random loads within allowed voltage and frequency limits.

In the submittal dated August 1, 1986, TVA stated that a problem existed should the random loads be running or started concurrent with the sequenced load (i.e., 700hp containment spray pump) at the t=30 sec. This is due to the fact that the random loads are the automatic process loads which could be initiated at any time by temperature, level, or pressure. To be conservative, the random loads were considered as a block load applied at t=o seconds which resulted in a worst case condition when starting the containment spray pump at t=30 sec. The analysis found that the worst case loading occurs for a Blackout with safety injection (SI) signal-phase B containment isolation (case c). The worst train was 2B for all three cases. Under this condition, the contractor determined that the DG on the 2B train would be able to take a maximum of 4482kW at t=30 second step. Thus, the contractor concluded that for all three cases the generator 2B would be able to load at the required time and do so within acceptable voltage and frequency limit for all steps <u>except</u> for the t=30 seconds with a SI signal and phase B isolation case.

As the corrective action for this problem (SCR SQNEEB 8629), TVA proposed the intentional time delay of eight 480V ac loads to maintain the maximum load within the value of 4482kW at the 30 second step. These loads include four supplies to the 480V ac board room air conditioning system (a part of the random loads to be delayed for two minutes and 30 seconds) and four supplies to 125V dc vital battery chargers which charge the four 125V dc Class 1E batteries (i.e., delaying the loading of the 125V vital battery charger for five minutes poses no problem since the 125V dc vital batteries are designed to carry plant emergency loads for two hours during a blackout).

By comparing the maximum load (4482kW) at t=30 sec determined by the contractor with the load reduction achieved by the intentional time delay of eight 480V ac loads, the staff finds the diesel generator 2B within the acceptable limits of loading for the aforementioned three accident cases.

Based on its review of the generator capability and the load sequencing achieved for the scenarios evaluated, the staff finds that the DG can start and load all the equipment within acceptable voltage and frequency limits. Therefore, the load reduction acceptably resolves the concerns for the accident conditions identified above.

However, TVA has advised the staff that a delayed SI signal with station blackout is being analyzed now, and that this DG load analysis may require a new or revised resolution. The staff will review this analysis when it becomes available and prepare a supplemental evaluation report.

In addition, there was another concern (SCR SQNEEB 8646) that voltage will fall below the 75 percent minimum allowed by R.G. 1.9 and not recover within the specified time interval if the DG breaker closes at 80 percent of nominal voltage. This is due to the fact that the 6.9kV shutdown board DG supply breaker is designed to close at the minimum of 80 percent of nominal voltage with the diesel running at 850 rpm. However, a review of the DG preoperational test and the Surveillance Instruction (SI-7/performed on January 23, 1986) revealed that the DG voltage is actually above nominal before receiving the permissive signal for engine speed at 850 rpm. In view of the fact that the DG voltage is above 80 percent prior to closing the supply breaker, TVA concluded that no corrective action is required. The staff agrees with the TVA assessment; therefore, this item is resolved.

5. 125V DC Vital Control Power System

The purpose of the 125V dc vital control power system study was to determine if there is adequate voltage available at the terminals of the selected components for proper operation during a loss of ac power. There are 600 safety-related circuits and because doing voltage calculations for each circuit would represent a lengthy task, TVA elected to perform voltage calculations for a representative sample of typical circuit types and categories as opposed to analyzing all Class 1E circuits. TVA selected 35 such circuits and classified them into six unique circuit categories. These are:

a. 6.9kV shutdown board control circuits
b. 480V shutdown board control circuits
c. Fuse column circuits (primarily solenoid valve circuits)
d. Auxiliary relay rack circuits
e. Reactor trip switchgear breaker control circuits
f. 120V ac vital inverter feeder circuits

A number of sample circuits were selected from each of the above categories and analyzed. This consisted of calculating the voltage available at the terminals of the loads and comparing this voltage with the manufacturer's minimum voltage rating. If a problem was identified in any of the above categories, all the circuits in that category were evaluated. The staff concurs with TVA that this is acceptable since the representative sample chosen was based on a worst case approach.

To calculate the maximum voltage drop, the cable length used was either the con-struction pull length or design length plus 30% with the cable temperature at 90°c. For categories c, d, e and f, the vital battery two hour discharge minimum terminal voltage of 105V dc was used. However, for categories a and b, the calculations were performed with a battery voltage of 120V dc. TVA based this assumption on the fact that "per Sequoyah design criteria, the voltage shall be 120V dc which is the initial battery voltage upon loss of ac power. Due to the automatic undervoltage load shedding feature, the critical operational period for the 6.9KV and 480V shutdown boards is immediately upon loss of ac power, i.e., battery voltage of 120V dc." The staff concurs with TVA's assumption since these momentary loads will occur during the initial discharge phase of the battery duty cycle and each operation lasts only a fraction of a second. In addition the battery is not expected to be discharged to a level of 105 Vdc since the diesel generators are designed to supply power to the chargers within a few minutes of loss of offsite power.

TVA's February 10, 1986 calculation (SCR SQNEEB 8605) identified inadequate minimum dc input voltage to 120V ac vital inverters on Unit 1 per the manufacturer's specification. The original vendor minimum input voltage to these inverters was 105V dc. Subsequently, the inverter vendor has performed a recertification test for the same type inverter at TVA's Watts Bar and confirmed that the Sequoyah Unit 1 inverter will also operate properly at 100V dc minimum, thus eliminating the concern. Also, there were two other problems: (1) inadequate dc input voltage for 24 solenoid valves associated with the steam dump system during a minimum vital dc system voltage condition (105V dc), and (2) excessive voltage drop (based on original manufacturer's data) for two flow-modulated solenoid valves between the modulator (valve controller) and the valve during any dc system voltage.

According to TVA's latest resolution dated August 1, 1986, a TVA review has found that:

1) The operation of these 24 valves is not required for safe shutdown.

2) A further review by the manufacturer has found that adequate voltage is available for the above flow-modulated solenoid valves.

Based on its review of the 125V dc voltage calculation along with the additional clarification, the staff finds that adequate voltage is available for proper operation during a loss of ac power and no further corrective action is required for this SCR.

6. 120V AC Vital Control Power System

The purpose of 120V ac vital control power system study was to determine if the safety-related, 120V ac loads powered from the 120V ac vital instrument power boards have adequate voltage for proper operation. TVA reviewed all Units 1 and 2 safety-related loads and identified a total of 166 such safety-related circuits. These circuits were classified into four groups (i.e., relay, valve, monitoring and instrumentation and control circuits) according to the type of loads served. The voltage calculations were performed on a representative sample of each group (at least 10%). If the evaluation identified no failures in a group, a high degree of confidence was achieved and no further evaluation was performed. If a failure was identified, then the voltage calcuation for every circuit in the group was performed.

The inverter (power source) is assumed (worst case) to be operating at full load with a maximum output (125 amp) and minimum output voltage 117.6V (120V - 2%) with a phase angle of 41°. The voltage available at the terminals of each component supplied by the inverter was calculated and its adequacy determined by comparing with the manufacturer's minimum voltage rating. The cable lengths used were either the construction pull lengths or design length plus 30% with the cable temperature at 90°C. Also, if a component could be energized via an alternate path, the path that produced the largest voltage drop was used in the calculation.

In a preliminary study (Revision 0) dated December 27, 1985, eight circuits from three groups (i.e., valves, monitors and instrumentation/controls) were found to have excessive voltage drop. These circuits were identified for corrective action. In addition, it was necessary to perform further voltage drop analyses on all the circuits in the groups in which deficiencies were identified. A new analysis dated January 30, 1986 identified a total of 12 circuits with excessive voltage drops which were documented for corrective action under SCR SQNEEB 8532.

The staff concurs that the use of such a sampling technique can be justified in determining the adequacy where a large number of circuits are involved. Further, this type of categorization sampling technique can be a useful tool to identify and localize problem areas in circuit design; therefore, the staff finds this technique acceptable.

TVA found that the above 12 circuits were divided into three groups: (1) radiation rate meters within the monitoring group, (2) post accident sampling in the valve group, and (3) reactor vessel level instrumentation in the instrumentation and control group. The corrective actions for these deficiencies involved (a) pulling larger size cable to reduce cable impedance, and (b) paralleling supply cables to reduce the current through various portions of the affected circuits. These corrective actions will be completed before restart of Sequoyah.

Based on its review of the 120V ac calculations and TVA's proposed corrective actions for resolving the identified deficiencies, the staff concludes that the safety related 120V ac loads powered from the 120V ac vital instrument power boards will have adequate voltage for proper operation.

FINDINGS

In summary, based on its review of the six Sequoyah electrical calculations identified above, our findings are as follows:

a. The systems which were analyzed include the essential onsite power systems required for safe plant operation.

b. The input data is sufficiently comprehensive and detailed for consideration of all modes of plant operation. The calculations performed assumed worst case system and plant conditions. The methodology used in these analyses was appropriate for assessing voltage drop and overload problems in the systems. TVA found problems which required corrective action. These corrective actions will be completed prior to restart.

c. TVA proposed resolutions for each deficiency identified in the electrical calculation and the proposed resolutions are found to be acceptable. TVA also provided a commitment to implement the proposed resolutions before SQN restart.

d. The content and format of each system calculation which includes the purpose, assumptions, sources of information, description of methodology, results and conclusions, is adequate for documentation purposes.

e. All documentation of the calculations identified above considered as being necessary for restart is in-place and up-to-date with its input data computer formated for easy manipulation of data (i.e., data is retrievable for maintenance and update).

f. A procedure and design change review program has been established and implemented to ensure that those identified deficiencies will be corrected prior to restart and appropriate technical specifications, where applicable, will be provided.

CONCLUSIONS

In regard to the six electrical calculation areas identified above, based on its review of the information provided by TVA as reflected in the above findings, the staff concludes that:

1) The SQN electrical calculation program provides sufficient documentation in support of a conclusion that the design of systems meets their respective design requirements.

2) The resolutions proposed for the problems identified in the electrical calculations and the TVA commitment to implement them before restart of Sequoyah are acceptable.

3) Assuming complete implementation of the commitment cited above, there is reasonable assurance the systems addressed will provide safe startup and operation of Sequoyah.

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