NRC Region 2 – CIB1 / Watts Bar 2 – IP&S 194 Additional Questions

ITEM	DESCRIPTION	STATUS
1 GC	Procedures for testing Unit 2 Emergency Diesel Generator Surveillance Procedures that include SI equipment and support loads from Unit 1 Basis: While reviewing some details of the question number 4 for Load Testing of Diesel Generators for Loss of Offsite it is evident that Unit 1 procedures include interfacing with Unit 2 for a safety injection signal from Unit 1. However, I could not find the reverse when reviewing Unit 2 EDGs. The procedures do not appear to include a safety injection signal from Unit 2 for the test of Unit 2 diesel generators or a Unit 2 safety injection signal when testing the Unit 1 EDGs. It appears that Unit 2 being in operation is not covered with the procedures that I was shown. Can you clarify this for me, please?	Pending per email from J. Fischer on 9/23/2014 That procedure for Unit 2 has not been finalized yet. PTI 262 – 01(Train A) & 02(Train B)
2 GC, CJ	TVA issued calculations EDQ00099920070002 – Rev 43 and RII is reviewing it. TVA says it is necessary to close IP&S 210 on Grid reliability. We say it is necessary to close IP&S 194 on Adequacy of Onsite Electric Distribution System to cover 2-unit operations. TVA disagrees with the last statement. Final Closure Package 10177824 had been issued in 06/26/2014.	Pending TVA "meeting with Transmission Operations" RII waiting for TSO procedures requested.
3 GC	IP&S – 231 Cable Separation inside panels. Previously inspected and found not ready to close. TVA will do a "final look" inside panels and NRC should witness the final look or do a sampling one later.	RII is waiting for July 20, 2015 to inspect this item.
4 CJ, GC	IP&S – 315 Cable CAP sub-issue, electrical separation and isolation in conduits throughout the plant. This is a large item, need to begin inspections. It will be hard to define completion	RII is waiting for July 20, 2015 to inspect this item.
5 GC	Provide summary of peak loads on shutdown boards 1A-A, 1B-B, 2A-A, and 2B-B for different accident scenarios.	Pending
6 GC	Calculation EDQ00099920070002 Rev 40 page 100 of 557 Section 3.6 Grid Voltage – 161 kV system short circuit contribution is provided with a 10% margin for possible variation in future grid. Is there an evaluation done using infinite grid source that would be even higher than the 10% margin or does this margin exceed the infinite bus scenario?	Pending and must be requested
7 GC	Calculation EDQ00099920070002 Rev 40 page 102 of 557 Section 3.17 – Cables being modeled at 90°C provides for an ampere rating for the particular AWG size but if termination are rated for 60°C or 75°C the ampere rating would be less which may be a problem with heating at the terminations.	Pending and must be requested
8 GC	Provide a copy of calculation WBN EEB-MS-TI05-0001 to review list of assumptions applicable to Calculation EDQ00099920070002 Rev 40 page 103 of 557 Section 4.	Pending and must be requested
9 GC	Calculation EDQ00099920070002 Rev 40 page 106 of 557 Section 6.0 – Does the calculation provide an analysis for minimum running voltages that point out lower than allowed voltage drop condition in the distribution system, including safety injection phase B? Indicate where is this information shown?	Pending and must be requested

10 GC	Provide supporting documentation for the time delay setting of the DVR at 10 seconds and for the loss of voltage (LOV) at 0.75 seconds. Provide justification that these time delays do not need to be shorter or longer than the setting provided. Is the LOV coordinated with automatic reclosers provided in the offsite grid system in any significant manner?	Pending and must be requested
11 GC	Provide supporting documentation for any time delay provided for transferring SI loads from offsite power to diesel generators when the transfer has been initiated by the degraded voltage relay assuming the SI equipment has already started up and is running.	Pending and must be requested
12 GC ?	Calculation WBNEEBMSTI060029, "Degraded Voltage Analysis" Rev. 37. Page 55 of 374 Section 5.1.1.1., states that: "The model is configured such that the 6.9kV Shutdown Boards are fed solely from a fixed voltage control utility set to 6555V." Does a fixed voltage control utility represent an infinite bus?	Pending and must be requested. May be unnecessary based on NRR's acceptance of TVA DVR settings.
13 GC	Calculation WBNEEBMSTI060029, "Degraded Voltage Analysis" Rev. 37. Page 55 of 374 Section 5.1.1.2., indicates that motor loads are evaluated to verify that the motor terminal voltage is (typically 460 +/- 10%) to prevent motor overheating damage. Is there a time constant associated with this motor overheating damage for a voltage below the -10% level?	Pending and must be requested
14 GC	Calculation WBNEEBMSTI060029, "Degraded Voltage Analysis" Rev. 37. Page 56 of 374 Section 5.2.1., indicates that the chosen upper limit for the degraded voltage reset ensures that motors and motor-operated valves (MOVs) have adequate starting voltage and that 6555V provides conservative results for block motor starting during an accident. How is this statement confirmed?	Pending and must be requested
15 GC	The circuits feeding the 480 volt safety related motors that are part of the ECCS are the all provided with Motor Circuit Protectors or Thermal-magnetic breakers. Do these calculations account for higher currents imposed on thermal magnetic breakers for longer time do to overload bypass?	Pending and must be requested
16 GC	Calculation WBNEEBMSTI060029, "Degraded Voltage Analysis" Rev. 37. Page 59 of 374 Section 5.4.4.1.6, please explain the entire discussion presented on this page. Provide the time-current curves for the Thermal Overloads (TOLs).	Pending and must be requested
17 GC	Calculation WBNEEBMSTI060029, "Degraded Voltage Analysis" Rev. 37. Page 71 of 374 Table 1-1 Steady-State Voltage Summary (Unit 1 Boards) are the voltage levels shown for Shutdown Board 1A1-A 1600 considering the current limiting reactors?	Pending and must be requested
18 GC	Calculation EDQ00099920070002 Rev 40 page 250 of 557 Attachment 11.3.i – Motor Starting Analysis ERCW pumps are still shown as 800HP and these are supposed to be 805HP. Does the voltage analysis change in any way? How is the "Worst Case Terminal Voltage(%)" developed? Why the 3.3% difference in voltage between ERCW PMP A-A and B-A? That equates to approximately 220+ volts.	Pending and must be requested
19 GC	Calculation EDQ00099920070002 Rev 40 page 332 of 557 Attachment 11.7 – Section 7.0 Summary of Results – Is the addition of Unit 2 inverter acceptable the same way Unit 1?	Pending and must be requested

20 GC	Calculation EDQ00099920070002 Rev 40 page 396 of 557 Attachment 53479, a number of EDCRs replacing existing motors for larger motors on Unit 2. Changes motors from 75HP to 100HP. Page 401 of 557 adds more load. Page 411 adds more.	Pending and must be requested
21 GC	Calculation EDQ00099920070002 Rev 40 page 518 of 557 Attachment for Chiller replacement is pointing to an overloaded transformer acceptability due to calculations considering 55° instead of 65 ° rise which allows heavier loading and in a third case, loads were not applied a diversity factor.	Pending and must be requested
22 CJ	**6.2** This analysis will meet the following criteria: a. If the voltage on the 6.9 kV shutdown boards drops below the degraded voltage dropout voltage analytical limit of 6555V. It recovers above the upper boundary of the degraded voltage reset voltage (operational limit) of 6681V within the lower limit of the degraded voltage time delay of 8.5 seconds (Att. 11.6) so as not to isolate the 6.9kV shutdown boards from the preferred offsite power source. b. Voltage at 480V boards/MCCs recovers such that all components receive sufficient voltage to start within 5 seconds after a Safety Injection Signal (SIS) that block starts all ESF motors. Delaying the starting of safety injection motors and closure of the Main Feedwater isolation valves for five second with offsite3 power available is acceptable as per Westinghouse's safety evaluation (Ref. 2.16). Do these statements mean that this is an accident scenario that is assumed and modeled in this calculation or are these results from this calculation. This is important to understand the purpose of the calculation.	Pending and must be requested
23 CJ	**6.4 Motor Starting Analysis** states: "This analysis is performed by setting utility bus at the 6.9kV shutdown board at the analytical dropout limit of the degraded voltage relay (6555V) and running the following analysis under normal, SIA and SIB loading: • Individual motor starting analysis to determine starting voltage for continuous duty motors and MOVs" If you set the shutdown board at 6555V and do a voltage drop analysis to find out the resulting voltage at each component, how will that determine the required voltage to start the load? The required voltage to start the load is a characteristic of the component and its application. This doesn't seem to prove of reveal anything. What is the purpose of this calculation and what are the results used for?	Pending and must be requested
24 CJ	**6.6.1 SI Actuated 89-10 MOVs** This portion of the calculation appears to say there are cases analyzed where certain safety related MOV's will not receive adequate voltage to start, but this will be OK because the voltage recovers in 5 seconds, and no damage will be done to the MOV while being stalled for 5 seconds. What documentation supports the conclusion that no damage will be done to the MOV's experiencing locked rotor current for 5 seconds?	Pending and must be requested

25 CJ	**6.9 Short Circuit** states: The results of the calculated short circuit study cases are contained in Attachment 11.3.e. The analyzed configurations are listed in Attachment 11.1… The overloaded buses are identified in Attachment 11.3.g… How is that consistent with the following? **8.1.1.4 Bus/Board Loading** Based on a review of ETAP output reports for various APS alignments listed in Attachment 11.1, loading of all buses /boards were determined to be within their rating specified in Section 3.27 Also **9.2 Bus/Board Loading** All Class 1E and non-Class 1E buses have adequate ratings.	Pending and must be requested
26 CJ	**9.4 89-10 MOV Analysis** **9.4.1** All Unit 1 and 2 89-10 MOVs results require review by Mechanical Design Group to determine the acceptability of the available terminal voltage. NRC needs to review the documented results of this review by the Mechanical Design Group and those documents need to be referenced in this calculation.	Pending and must be requested
27 CJ	**8.1.7 Fault Capability** The maximum short circuit on the safety related motor control centers is 17218A and thus exceeds the interrupting rating of 14000A for the 100A frame EF3 magnetic circuit breakers. These circuit breakers are used with starter circuits and as per Ref. 2.12 the combination starter circuit interrupting rating is 22000A. Therefore, the interrupting rating exceeds the available short circuit. Have these underrated EF3 breakers now been replaced on the both units?	Pending and must be requested
28 CJ	**8.2.4 Fault Capability** Available fault current for 6.9kV RCP boards' breakers exceeds the breaker interrupting rating when all eight U1 and U2 RCP motors along with other BOP loads are transferred to the 161kV system with one CSST A or B out of service. To alleviate this condition, whenever CSST A or B is out of service, load shed logic has been activated to trip 2 RCP boards of each unit prior to transfer of Units 1 and 2 BOP loads to the remaining CSST A or B (Section 5.1). If there is a trip of two RCPs while the plant is running, it will trip the plant. Why is that an OK fix?	Pending and must be requested
29 CJ	**Appendix 10.3, 6.0 Summary of Results and Conclusions** Based on the analysis, as stated in Section 5.0, all motors have adequate starting voltage to perform their intended safety function during an accident condition with the APS (6.9kV shutdown boards) at the degraded voltage relay dropout limit of 6555V. Available voltage for the MOVs requires review by Mechanical. See Section 9.4. Is this still the conclusion of this calculation?	Pending and must be requested

30 CJ	Please provide an explanation of the meaning of the following statements. **Statement in Table of Contents:** Note: Analysis in Appendices 10.4 through 10.10 has been rolled over in to the ETAP analysis in the main body of the calculation. **3.17** The cables are modeled at 90°C. ETAP uses this cable information to perform voltage drop analysis. Cable temperature of 25°C is used to perform short circuit analysis and ETAP automatically converts the cable data from 90°C to 25°C. **3.24** Analysis for the available voltage at the 89-10 MOVs, which operate under Steady State conditions and are not required to operate on accident signal, is performed under degraded voltage conditions. Voltage under degraded voltage conditions is enveloping of the voltage under steady state conditions, therefore, separate analysis with available voltage under steady state conditions is not performed. **4.15** Continued operation of Unit 1 MOVs is currently justified based on the analysis in Ref. 2.36. The current evaluation for Unit 1 89-10 MOVs is this calculation is not valid until this calculation becomes calculation of record for Unit 1 except for the single motor start analysis at degraded voltage for which this is the calculation of record for Unit 1. **4.17** FSAR Section 8.2 shall be revised to address the following:: • Deleted • Replace the statement “design basis accident in one unit and a concurrent full load rejection is the other unit with “design basis accident in one unit and simultaneous orderly shutdown of the other unit’	Pending and must be requested