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50-388 Susquehanna Steam Electric Station, Unit 2, Pennsylv			05000388
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SUBJECT: Submits info in preparation for upcoming SSFI re plant-
electrical distribution sys.

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June 7, 1990

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SUSQUEHANNA STEAM ELECTRIC STATION
ELECTRICAL DISTRIBUTION SYSTEM
PLA-3395 FILE R41-2

Docket Nos. 50-387
50-388

Dear Mr. Martin:

As part of PP&L's efforts in preparation for the upcoming SSFI, as well as continuing efforts to resolve our design basis for degraded grid voltage conditions (related to an inspector unresolved item), identification of several issues/concerns regarding documentation of and assumptions made in analyses is anticipated. Consistent with our process for reportability evaluations, two such identified issues have been determined to meet the criteria of 10CFR50.9, and this letter is being submitted pursuant thereto. Additional issues, as appropriate, will be either reported under separate letters or discussed in our planned meeting on degraded grid. The two issues are:

- o Certain electrical system calculations are less conservative than previously understood when a postulated single failure is assumed.
- o The potential that more than one diesel generator will be affected due to a postulated single failure in the 125 V DC system.

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Potential Non-Conservatism in Calculations:

The K11A relay is actuated on a LOCA signal (High Drywell Pressure and/or Low Water Level) and is in the Core Spray start logic. This relay is used to start Diesel Generator A and to initiate LOCA load isolation of non-class IE loads on Class IE 480 V buses for channels A and C. If a LOCA were to occur in Unit 1 with no loss of offsite power (LOOP), and the Class IE relay designated K11A were to fail and no non-class IE failures occurred, the following would occur:

- Diesel Generator A would fail to automatically start
- Degraded grid timers for the 84% undervoltage protection for the 4160 V Class IE Channel A and C buses would fail to reselect from 5 minutes to 10 seconds.
- Drywell coolers 1V411A - 1V418A (8 coolers) would not trip.
- The following non-Class IE components would not trip:
 - o ESW Pumphouse Panel OPP509
 - o ESW Lighting Panel OLP16
 - o Spray Pond Piping Drain Pumps OP595A1 and OP595A2

The effects of these scenarios are as follows:

- Diesel Generator A will start if a LOOP were to occur. The results are not altered by the sequence of events.
- The failure of the degraded grid timers to reselect has no effect on the electrical distribution system performance since the non-Class IE failures are not assumed.
- The failure of the drywell coolers to trip would result in 480V MCC 1B236 (Channel C) being loaded with 75 hp more than is presently modelled in the plant electrical system model. All electrical components are expected to operate since preliminary calculations indicate that voltages will be acceptable.

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- The failure of the non-Class 1E loads at the ESW pumphouse to trip would result in 480 V MCC OB517 being loaded with an additional 190 KW than is presently modelled in the plant electrical system model. All electrical components are expected to operate since preliminary calculations indicate the 480 V MCC OB517 voltages will be acceptable.

Based on our calculations of higher loads at the 480V level, the voltages are lower, however, the offsite power supplies will not be overloaded and acceptable plant voltages will be obtained. This issue is being tracked in PP&L's Engineering Discrepancy Reporting System.

For a LOCA in Unit 2 along with a failure of the K11A relay in Unit 2, it is PP&L's opinion that the voltages will be acceptable since the Unit 2 electrical loads are lower than the Unit 1 electrical loads in the event of a Unit 1 LOCA.

Single Failure in 125 V DC System

With respect to the issue of potentially affecting two diesel generators with a single failure, if for Unit 1, a LOCA, LOOP and failure of 125 V DC distribution panel 1D614 were to occur, the following would occur:

- Diesel Generator A would fail to automatically start
- Channel A of the electrical system in Unit 1 would be lost
- Drywell Coolers 1V411A - 1V418A would not trip
- Control Structure Chiller A would not trip

The effects of these failures are as follows:

- The failure of the electrical system Channel A and Diesel Generator A were analyzed in the FSAR. The FSAR analysis for these losses would not be altered.
- The failure of the drywell coolers and the control structure chiller to trip will result in an additional 426 Hp load on Diesel Generator C at synchronization. The effect of these additional loads on the performance of Diesel Generator C is unknown at this time. Additional calculations are necessary in order to assess the effect of the additional loads. Also, additional review of the loads connected to the offsite or onsite electrical power supplies if a Class 1E failure occurs needs to be completed to ensure that all loads are identified. It is not anticipated that the

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diesel's 2,000 hour rating of 4700 KW will be exceeded because the ESW C pump will not operate under these assumed conditions since the ESW pump's control power is from Distribution Panel 1D614.

For Unit 2, for a LOCA, LOOP and failure of 125 V DC distribution panel 2D624, the following failures would occur:

- Channel B of the electrical system in Unit 2 would be lost
- Drywell Coolers 2V411B - 2V418B in Unit 2 would not trip
- Turbine Building Chiller 2B would not trip
- Control Rod Drive Pump 2B would not trip

The effects of these failures are as follows:

- The failure of the electrical system Channel B has been analyzed in the FSAR. The FSAR analysis would not be altered.
- The failure of the drywell coolers, the turbine building chiller, and control rod drive pump to trip will result in an additional 1455 hp load on Diesel Generator D at synchronization. The effect of these additional loads on the performance of Diesel Generator D is not known at this time. Additional calculations are necessary in order to assess the effect of the additional loads. An additional review of the loads connected to the offsite or on-site electrical power supplies if a Class IE failure occurs needs to be completed to ensure that all loads are identified. Also an analysis of the effect of running the turbine building chiller without its auxiliaries must be completed. With the additional 1455 hp load on the diesel generator, there is the potential for the diesel generator performance to be affected.



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In conclusion, additional calculations and analysis need to be performed in order to verify there is a problem with overloading the diesel generators. This issue is being tracked in PP&L's Engineering Discrepancy Reporting System.

Very truly yours,



H. W. Keiser

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pla\3395.ctc

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