Duquesne Light
Nuclear Construction Division
Robinson Plaza, Building 2, Suite 210
Pittsburgh, PA 15205

2NRC-5-123
(412) 787-5141
(412) 923-1960
Telecopy (412) 787-2629
August 26, 1985

United States Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Mr. George W. Knighton, Chief
Licensing Branch 3
Office of Nuclear Reactor Regulation

SUBJECT: Beaver Valley Power Station - Unit No. 2
Docket No. 50-412
PSB Outstanding Issues

Gentlemen:

This letter forwards responses to Power Systems Branch outstanding issues described in the final draft Safety Evaluation Report. Responses to the following issues are attached:

Open Issue 7(a) - Sharing of Offsite Circuits Between Units 1 and 2
Open Issue 8(a) - Voltage Analysis
Open Issue 8(b) - Load Testing of D.G.
Open Issue 8(c) - Capability of D.G. to Accept Design Load After Prolonged No-Load Operation
Open Issue 8(d) - Replacement for Class 1E Loads
Open Issue 8(g) - Separation of Containment Electrical Penetrations
Open Issues 8(i), (j), (k) - Description of Physical Separation; Routing of Power Circuits in Cable Spreading Area; Justification for Solid High Hat Covers
Open Issue 8(m) - Compliance with RG 1.63
Open Issue 11(b) - Description of Control, Instrumentation, Sensor, and Alarm Testing/Calibration
Open Issue 11(f) - Description of the Operation of D.G. Room Ventilation System During Loop
Open Issue 12(a) - Inservice Inspection Program for Extraction Valves
Unnumbered OI - D.G. Air Starting System Setpoints
Backfit Issue 14 - D.G. Air Dryers

We believe this addresses all remaining staff concerns with exception of the confirmatory site visit.

DUQUESNE LIGHT COMPANY

By J. J. Carey
J. J. Carey
Vice President

SUBSCRIBED AND SWORN TO BEFORE ME THIS 23 DAY OF August, 1985.

Sheila M. Fattore
Notary Public

SHEILA M. FATTORE, NOTARY PUBLIC
SHIPPINGPORT BORO, BEAVER COUNTY
MY COMMISSION EXPIRES SEPT. 16, 1985
Member, Pennsylvania Association of Notaries

GLB/wjs
Attachments

cc: Mr. B. K. Singh, Project Manager (w/a)
Mr. G. Walton, NRC Resident Inspector (w/a)

B001
1/1

COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF BEAVER)

On this 23 day of August, 1985, before me, a Notary Public in and for said Commonwealth and County, personally appeared J. J. Carey, who being duly sworn, deposed and said that (1) he is Vice President of Duquesne Light, (2) he is duly authorized to execute and file the foregoing Submittal on behalf of said Company, and (3) the statements set forth in the Submittal are true and correct to the best of his knowledge.

Sheila M. Fattore
Notary Public

SHEILA M. FATTORE, NOTARY PUBLIC
SHIPPINGPORT BORO, BEAVER COUNTY
MY COMMISSION EXPIRES SEPT. 16, 1985
Member, Pennsylvania Association of Notaries

ATTACHMENT 1

Outstanding Issue 7(a):

By Amendment 9 to the FSAR, the applicant revised Section 8.2.1.4.1 to state that the 138-kV offsite power circuits are dedicated to BVPS-2 rather than being shared between Units 1 and 2. This dedication is inconsistent with the BVPS-2 design as shown in FSAR Figure 8.1-2. Clarification of this inconsistency will be pursued with the applicant, and the results of the staff review will be reported in a supplement to this SER.

Response:

FSAR changes are in process for Amendment 11 to update Figure 8.1-2. Circuits serving BVPS-2 from the 138-kV busses in the switchyard are separate and independent from those serving BVPS-1.

ATTACHMENT 2

Outstanding Issue 8(a):

The voltage levels at the safety-related loads should be optimized for the maximum and minimum load conditions that are expected throughout the anticipated range of voltage variations of the offsite power sources. The applicant was requested to perform a voltage analysis and verification by actual measurement in accordance with Positions 3 and 4 of BTP PSB-1 (NUREG-0800, Appendix 8A).

By letter dated September 7, 1984, the applicant provided the partial results of a voltage and load analysis perform in accordance with Position 3 of BTP PSB-1. On the basis of these results, the staff finds that Class 1E equipment will not be subject to voltages exceeding the manufacturer-recommended tolerances and is acceptable with the following exceptions.

(1) The analysis results indicate that voltage will drop below 80% when the 6000-hp reactor coolant pump starts. Justification for this voltage drop will be pursued with the applicant, and the results of the staff review will be reported in a supplement to this SER.

(2) The analysis results indicate that high voltage at certain 480-V substation and motor control center (MCC) buses may result in excessively high terminal voltage at certain motors when operating at light load. The applicant indicated that a voltage and load analysis for light-load cases is being performed and would be submitted for staff review at a later date. This item will continue to be pursued with the applicant, and the results of the staff review will be reported in a supplement to this SER.

(3) The analysis results only addressed voltages at the 4160-V and 480-V load center buses, 480-V MCC buses, and the terminals of 4160-V and 480-V load center-connected loads for both Class 1E and non-Class 1E equipment. Analyses not yet completed include terminal voltages at Class 1E 480-V MCC loads, Class 1E 120-V ac loads, and Class 1E 125-V dc loads. The applicant indicated that these analyses would be submitted for staff review at a later date. This item will continue to be pursued with the applicant, and the results of the staff review will be reported in a supplement to this SER.

Response:

(1) This was resolved in letter 2NRC-5-017, dated February 5, 1985.

(2) Calculations E-86, "Station Service Maximum Voltage Analysis," (4,160-V and 480-V) and E-90, "Class 1E 120-V System Voltages Under Light Load" are attached. These calculations show that the systems provide acceptable maximum voltage levels when operating at light load.

(3) Calculations E-82, E-76, and E-75 provide an analysis for 480-V MCC loads, 120-V ac loads, and 125-V dc loads. Summaries which are attached show acceptable results. The design basis for the motor control center system is to provide a maximum of 414 volts which is 90% of motor nameplate voltage for steady state running conditions.

To achieve this design condition, the voltage drop allowable is divided between cable leads and intermediate busses in the electrical distribution system. The minimum 422 voltage at the motor control center utilized in calculation E-82 allows for approximately 8 volts maximum lead drop to the motor terminals. The minimum acceptable voltage of 90-V dc for certain devices in calculation E-75 is based upon equipment manufacturer's specifications.

CALCULATION IDENTIFICATION NUMBER				
J.O. OR W.O. NO.	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE 3
12241	34 / electrical	E-22	N/A	

OBJECTIVE

The purpose of this calculation is to verify the adequacy of existing or scheduled cables feeding the loads from 480 v motor control centers, to the following requirements:

- ample ampacity
- allowable voltage drop
- short circuit capacity

STONE & WEBSTER ENGINEERING CORPORATION

CALCULATION SHEET

5010.65

CALCULATION IDENTIFICATION NUMBER				PAGE 4
J.O. OR W.O. NO.	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	
12241	39/electrical	E-92	N/A	

ASSUMPTIONS

1. The min. allowable voltage on the load terminals assumed to be 414v (90% of 460v)

2. The min. voltage on MCC by steady state condition assumed to be 422v. Accordingly the max. allowable voltage drop for load feeders is:

   422 - 414 = 8v (exceptions - see page 9)

3. Load power factor for voltage drop calculations:

   for motors - from attachment "B" (or from motor-data sheets, where available)

   for heaters - 1.0

   for transformers - the power factor of the load and the cable assumed to be equal (conservative cable sizing)

4. Temperature

   Ambient - 40°c for tray and for exposed and embedded conduit

   - 20°c for underground ducts

   Conductor - 90°c

5. Cable in L-tray are installed with maintaining spacing from 1/4 to 1 cable diameter.

CONCLUSION

All scheduled and existing cables supplying the loads from 480v motor control centers are sized adequately for ampacity, voltage drop and short-circuit considerations.

CALCULATION IDENTIFICATION NUMBER				
J.O. OR W.O. NO.	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE 21
12241	EL 39	E-75		REV. 2

(2)

VII CONCLUSIONS

1. ALL PANEL CIRCUITS DESIGNED ARE CHECKED AND PROVED TO HAVE ADEQUATE VOLTAGE AT THE LOAD TERMINALS IN ACCORDANCE WITH THE METHOD ESTABLISHED ON PAGE 12 & 12A.

THIS IS DUE TO THE FOLLOWING FACTS:

A. PANEL CIRCUITS WHICH HAVE 1 AMP AND UP CONTINUOUS CURRENT ARE WITH EQUIPMENT HAVING A MINIMUM OPERATING VOLTAGE OF 90 V. (SEE ATT. I & II) AND THIS GIVES 106V-90V = 16 V ALLOWED VOLTAGE DROP OR 3611 AMP-FT.

B. MOST HEAVY LOADED CIRCUITS WHICH CONTAIN 3 TO 5 SOLENOID VALVES IN PARALLEL ARE RATED NO MORE THAN 100 VA WITH A MINIMUM OPERATING VOLTAGE OF 90 V. (SEE ANALYZED CKTS ON PAGE 12D TO 12G & 22 TO 22A)

C. THE ACTUAL LOAD CURRENT OF EACH EQUIPMENT IS LESS THAN THE CURRENT VALUE CALCULATED BASED ON 125 V IN THE DATA & LOADING SUMMARY LIST ATTACHED DUE TO VOLTAGE DROP IN THE CKTS (SEE P. 12G)

2. FOR UPS * VITBS2-1 & VITBS2-2 (SEE P. 12B & 20)
CONDUCTOR TEMP. CORRECTION HAS BEEN USED TO GET THE REAL VOLTAGE DROPS. THIS ALSO IMPLIES THAT THE REAL SYSTEM VOLTAGE DROP IS LESS THAN CALCULATED.
FOR THIS REASON AND THE REASON STATED IN VII-1-C, IT IS OBVIOUS THAT THE FOREGOING VOLTAGE DROP CALCULATION IS CONSERATIVE.

3. ATTENTION SHOULD BE GIVEN TO THOSE CKTS WHICH HAVE ESTIMATED CABLE LENGTH. IF THE CABLE IS TERMINATED AND PULLED LATER, THE ACTUAL CABLE LENGTH SHOULD BE USED TO CHECK THE VOLTAGE DROP OF THE CKT AGAIN.
FOR EXAMPLE, THE CKTS ANALYZED ON PAGE 12D & 22 HAVE ESTIMATED CABLE LENGTH (SEE ATTACHMENT V) THEY SHOULD BE RECHECKED ONCE THE CABLES ARE PULLED & TERMINATED.

4. ATTENTION SHOULD BE ALSO GIVEN TO THE ACTUAL AC LOAD ON UPS * VITBS2-1 & VITBS2-2 (SEE P. 7 & 16).
IF THEY'RE CHANGED, THE ENTIRE CALCALATION HAS TO BE RECALCULATED ACCORDINGLY.

5010.65

CALCULATION IDENTIFICATION NUMBER				
J.O. OR W.O. NO.	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE 26
12241	ELEC 39	E-75		REV. 2

5. AMPACITY:

ALL CABLES SHOWN IN ATTACHMENT I ARE ADEQUATELY SIZED FOR THE LOAD CURRENTS CALCULATED.

THE CABLE AMPACITIES ARE BASED ON 2BVM-42, REV. 3 AND NEC 1984 TABLE 310-20A. IN BOTH CASES A DERATING OF 0.82 IS APPLIED PER THE INSTRUCTION IN 2BVM-42 SECTION 10.

CABLE SIZE	AMPACITY (AMPS)	
500 MCM Cu TRIPLEX	475	
1/0 Cu	211	
#2 Cu	130	
#6 Cu	73	
#4 Cu	118	
#10 Cu	35	NEC 1984 TABLE 310.20A x .82
#12 Cu	26	NEC 1984 TABLE 310.20A x .82

CALCULATION IDENTIFICATION NUMBER				PAGE 3
J.O. OR W.O. NO.	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	
12241	ELECTRICAL	E76		

I. OBJECTIVE

THE OBJECTIVE OF THESE CALCULATIONS IS TO DETERMINE THE ADEQUACY OF THE 120 VAC SYSTEM TO DELIVER 108V AT THE LOAD WHEN A MINIMUM VOLTAGE OF 422V IS MAINTAINED AT THE 480V POWER SOURCE

II - DISCUSSION OF METHOD

REFERRING TO FIG. 1 IF TRANSFORMER RATIO 4/1 (CENTER TAP) IS USED AT 422V, THE NO-LOAD SECONDARY VOLTAGE WOULD BE

$V_S = (120/480) \times 422 = 105.5V$

AT 97.5% TAP

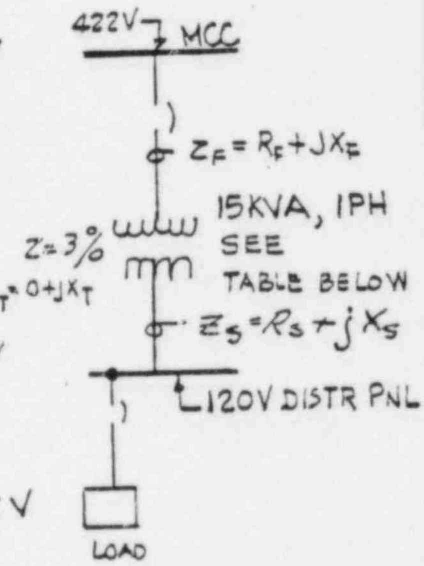
$V_S = 105.5/0.975 = 108.2V$

AT 95% TAP

$V_S = 105.5/0.95 = 111.05V$

AT 92.5% TAP

$V_S = 105.5/0.925 = 114.05V$



IT IS OBVIOUS FROM THE ABOVE RESULTS THAT, NEITHER THE CENTER TAP TRANSFORMER RATIO NOR THE 97.5% TAP WILL MEET THE MINIMUM LOAD VOLTAGE REQUIRED

NO-LOAD VOLTAGE RATIOS	
504 - 120/240V	5% ABOVE TAP
492 - 120/240V	2½% ABOVE TAP
480 - 120/240V	NORMAL RATG TAP
468 - 120/240V	2½% BELOW TAP
456 - 120/240V	5%
444 - 120/240V	7½%
432 - 120/240V	10%

BY HEVI DUTY ELECTRIC
S&W FILE NO. 2001.340-319-003

VII - CONCLUSIONS.

1) PNL*AC2-E1 THRU E9

CALCULATIONS OF THE ABOVE PNLS SHOW THE FOLLOWING RESULTS

a) MAXIMUM 120V LOAD CURRENT SHOULD NOT BE GREATER THAN 90 AMPERES

b) CONDUCTOR NO. 6 CU FOR THE INCOMING FEEDER FROM MCC IS CRITICAL FOR THE ABOVE LOAD

c) TRANSFORMER TAP:

95% FOR MAXIMUM 20 AMPERE LOAD

92.5% FOR LOADS ABOVE 20 AMPERES

d) UNDER THE CONDITIONS SET UP ABOVE, IT IS POSSIBLE FOR EACH PNL TO HAVE A MINIMUM BUS VOLTAGE OF 110V. THIS CONDITION ALLOWS 2 VOLTS FOR THE MAXIMUM VOLTAGE DROP IN THE BRANCH CIRCUITS WHICH IS SUFFICIENT TO MEET LOAD REQUIREMENT FOR THE CONDUCTOR SIZES AND CIRCUIT LENGTHS DESIGNED IN THIS PROJECT. PAGE 83 SHOWS A CONDUCTOR AMPERE-FOOT SCH. FOR THIS CONDITION.

▲ 5010.65

CALCULATION IDENTIFICATION NUMBER				
J.O. OR W.O. NO.	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE 83
12241	ELECTRICAL	E76		

CONDUCTOR AMPERE FEET SCHEDULE BASED ON PNL MAXIMUM OPERATING LOAD CURRENT OF 90A

FOR INTERPOLATION USE FORMULA BELOW

$$VD = \frac{2IL}{K}$$

NOTE:

FOR EXPLANATION OF USE OF THIS TABLE REFER TO PAGE 7

AT A BUS VOLTAGE OF 110V TRANSF TAP = 92.5%

COND. SIZE	12	10	8
K	732.76	1152.47	1789.87
2IL	VOLTAGE DROP		
400	0.546	0.347	0.223
600	0.819	0.521	0.335
800	1.092	0.694	0.447
1000	1.365	0.868	0.559
1200	1.638	1.041	0.670
1400	1.911	1.215	0.782
1600	2.184	1.388	0.894
1800	2.456	1.562	1.006
2000	2.729	1.735	1.117
2200	3.002	1.909	1.229
2400	3.275	2.082	1.341
2600	3.548	2.256	1.453
2800	3.821	2.430	1.564
3000	4.094	2.603	1.677
3200	4.367	2.777	1.788
3400	4.640	2.950	1.899
3600	4.913	3.124	2.011
3800	5.186	3.298	2.123
4000	5.459	3.471	2.235
4200	5.732	3.644	2.347
4400	6.005	3.818	2.458
4600	6.278	3.991	2.570
4800	6.551	4.165	2.682
5000	6.824	4.339	2.793
5200	7.096	4.512	2.905
5400	7.369	4.686	3.017
5600	7.642	4.859	3.129
5800	7.915	5.033	3.240
6000	8.188	5.206	3.352
6200	8.461	5.380	3.464
6400	8.734	5.553	3.576
6600	9.007	5.727	3.687
6800	9.280	5.900	3.799
7000	9.553	6.074	3.911

CALCULATION IDENTIFICATION NUMBER				
J.O. OR W.O. NO.	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE 84
12241	ELECTRICAL	E76		

2) VITAL BUS SYSTEM:

CALCULATIONS FOR THIS SYSTEM ARE DONE AS PER DATA & LOADING SUMMARY OF PANELS.

CALCULATIONS SHOW THAT EACH PNL. BUS OPERATES AT A GOOD VOLTAGE LEVEL TO PROVIDE SUFFICIENT VOLTAGE AT LOAD TERMINAL FOR LOAD REQUIREMENT

3) The maximum loading of the UPS system should not exceed the nameplate KVA rating. The panel loadings assumed a 60% P.F. which is lower than the 80% PF of the UPS.

CALCULATION IDENTIFICATION NUMBER				
J.O. OR W.O. NO.	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE 3
12241	ELE 39	E-90		

I- OBJECTIVE:

THE OBJECTIVE IS TO ANTICIPATE THE OVERVOLTAGE IN THE 120 V. A.C. CLASS IE SYSTEM DUE TO THE SIGNIFICANT REDUCTION IN THE OPERATING LOAD DURING THE PLANT REFUELING OPERATION.

II- DISCUSSION OF METHOD:

CALCULATION E-76 IS USED IN THIS ANALYSIS AS A SUPPORTING REFERENCE AS FAR AS LOAD DATA & FORMULAS ARE CONCERNED.

FIRST ATTEMPT IS TO INVESTIGATE THE IMPACT ON THE PANEL'S TRANSFORMER TAP SETTINGS BEGINING WITH A STUDY AT NO-LOAD.

VOLTAGE LEVEL ON MCC BUSES IS SELECTED AT 491V +4V MARGIN = 495V. (REFER TO ATTACHMENT I.) UNDER THIS CONDITION VOLTAGE FOR 95% TAP SETTING IS:

$$V_S = (120/480)(495/0.95) = 130.26V$$

THE ABOVE RESULT REFLECTS THE VOLTAGE AT THE PANEL AND IS BELOW THE ALLOWABLE MAXIMUM OF 110% RATED VOLTAGE FOR UTILIZATION EQUIPMENT. (THAT IS, $120 \times 1.1 = 132V$.)

THE VOLTAGE AT LOAD TERMINAL IS THEN BELOW THE VALUE OF V_S DUE TO FEEDER & BRANCH CABLES VOLTAGE DROP.

CALCULATION IDENTIFICATION NUMBER				
J.O. OR W.O. NO.	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE 4
12241	ELE 39	E-90		

DISCUSSION OF METHOD, CONT'D

RATED VOLTAGE FOR CLASS 1E LOADS HAS BEEN VERIFIED TO BE 120V ±10% FOR THE LOADS THAT ARE SERVED FROM THE EMERGENCY PNL * AC2-E1 THRU PNL * AC2-E9. THIS INFORMATION HAS BEEN OBTAINED FROM THE SET OF ELEMENTARY DWGS. ASSOCIATED WITH THE EMERGENCY PANELS.

FOR MORE DISCUSSION ON THIS MATTER, REFER TO CONCLUSION UNDER SECTION VII THIS CALCULATION

THE SUPPLY VOLTAGE AT DISTRIBUTION PNL FOR TRANSFORMERS SET AT 92.5% TAP IS :

$$V_S = \frac{495 \times 120}{.925\,(480)} = 133.78\,V.$$

SINCE THE ABOVE RESULT IS NOT ACCEPTABLE, THE PNLS. INVOLVED HAVE BEEN STUDIED INDIVIDUALLY TAKING INTO CONSIDERATION THEIR OPERATING CIRCUITS UNDER THE FOLLOWING ASSUMPTIONS.

a) 80% OF THE NORMAL LOAD OF EACH PNL IS CHOSEN TO REPRESENT THE MAXIMUM OPERATING LOAD DURING THE REFUELING OF THE REACTOR.

b) 50% IS THEN USED AS A DEMAND FACTOR FOR THE PANEL.

THE REASON TO STIPULATE THE ABOVE PER CENTS IS BASED ON THE FACT THAT DURING REFUELING CONDITION MANY CONTROL CIRCUITS (120V AC) ARE NOT DE-ENERGIZED BUT MANY ARE IN A NON-OPERATING MODE. IN THIS MODE THERE ARE RELAYS & POWER SUPPLIES WHICH ARE DRAWING POWER. FOR THIS REASON IT HAS BEEN ASSUMED THAT 120V AC DISTR. PNLS HAVE 80% OF NORMAL OPERATION LOADING, THEN TO ASSUME A CONSERVATIVE CALCULATION OF LIGHT LOAD-HIGH VOLTAGE A COINCIDENT DEMAND FACTOR OF 50% IS ASSUMED. THE TOTAL EFFECT IS THEN 0.8 × 0.50 = 0.40 OF THE NORMAL PNL LOADING AS PER E-76 REV. 2 ATT. I

STONE & WEBSTER ENGINEERING CORPORATION

CALCULATION SHEET

5010.65

CALCULATION IDENTIFICATION NUMBER				
J.O. OR W.O. NO.	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE 5
12241	ELEC 39	E-90		

DISCUSSION OF METHOD. CONT'D

THE FOLLOWING IS A LIST OF THOSE DISTRIBUTION PNLS THAT ARE FED THRU TRANSFORMERS SET AT 92.5% TAP

PNL*AC2-E1

PNL*AC2-E2

PNL*AC2-E8

CALCULATION RESULTS OF THE ABOVE PNLS. ARE SUMMARIZED IN TABLE SHOWN ON PAGE 9.

CALCULATION IDENTIFICATION NUMBER				
J.O. OR W.O. NO. 12241	DIVISION & GROUP ELEC 39	CALCULATION NO. E-90	OPTIONAL TASK CODE	PAGE 9

CALCULATION SUMMARY

			CONDITION			
			NORMAL	REFUELING		
REFERENCES						
E-76, REV. 2				THIS CALC.		E-86 REV.0
PNL I.D. NO.	DISTR. TRANSF. I.D. NO.	M.C.C. I.D. NO.	120V TOTAL CONTINUOUS AMPS.	240V-PHASE AMPS.	VOLTAGE AT PNL. (VOLTS)	MCC VOLTAGE LEVEL (VOLTS)
PNL*AC2-E1	TRF*PWR2-E1	MCC*2-E05	95.49	19.09	127.78	478 (ACTUAL)
PNL*AC2-E2	TRF*PWR2-E2	MCC*2-E06	58.66	11.73	132.0	491 (ACTUAL)
PNL*AC2-E8	TRF*PWR2-E8	MCC*2-E14	31.87	6.37	132.35	491 (ACTUAL)

VII - CONCLUSION

ELECTRICAL DATA FOR CLASS 1E LOADS WHICH ARE CONNECTED TO PNL*AC2-E1, PNL*AC2-E2 AND PNL*AC2-E8 HAS BEEN INVESTIGATED FROM THE SET OF ELEMENTARY DWGS. ASSOCIATED WITH SUCH PANELS.

REFERENCING MFR'S. INFORMATION OBTAINABLE FROM THESE DWGS., THE RATED VOLTAGE OF THE LOAD AT FULL LOAD CURRENT IS 120V ± 10%

FOR PNL*AC2-E8 THE SHORTEST WIRING LENGTH SOLENOID CIRCUIT WAS EVALUATED. THE VOLTAGE AT THE SOLENOID IS SHOWN TO BE 132V, AN ACCEPTABLE VALUE.

STONE & WEBSTER ENGINEERING CORPORATION

CALCULATION SHEET

5010.65

CALCULATION IDENTIFICATION NUMBER				
J.O. OR W.O. NO.	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE 3
12241	39 / ELECTRICAL	E-86	N/A	

OBJECTIVE AND SCOPE

This calculation is an addition to the calculation E-68 „Station Service and Load Analysis" rev. 0, 3/4/84. It considers 2 cases with offsite power supply at maximum voltage concurrent with minimum service load. These cases are:

Cold shutdown

Refueling

The objective of the calculation is to determine the maximum operating voltages at 4.16 kv and 480v buses and load terminals

All assumptions and references as well as computer program information - see calc. E-68

5010.65

CALCULATION IDENTIFICATION NUMBER				
J.O. OR W.O. NO.	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE 5
12241	39 / ELECTRICAL	E-86	N/A	

CALCULATIONS SUMMARY

BUS ID	COLD SHUTDOWN (comp. run 201)		REFUELING (comp. run 202)		NOTE
	VOLTAGE P.U. / volt	LOAD MW/MVAR/MVA	VOLTAGE P.U. / volt	LOAD MW/MVAR/MVA	
	4160 v SWGR BUSES				
2A	1.036/4311	13.55/6.59/15.07	1.0385/4320	3.06/1.60/3.46	
2B	1.037/4313	14.13/6.55/15.58	1.039/4322	1.16/0.67/1.35	
2C	1.036/4309	13.88/6.36/15.27	1.039/4322	1.04/0.55/1.17	
2D	1.037/4313	7.51/3.95/8.48	1.0385/4320	2.46/1.34/2.80	
2AE	1.036/4310	2.49/1.30/2.81	1.038/4319	2.67/1.38/3.00	
2DF	1.0365/4312	1.905/1.04/2.17	1.038/4318	1.93/1.03/2.19	
	480 v SUBSTATION BUSES				
2A	1.0195/489.4	0.296/0.160/0.336	1.031/494.8	0.137/0.074/0.156	
2B	1.021/490.3	0.253/0.138/0.288	1.024/491.7	0.253/0.138/0.288	
2C	1.024/491.6	0.222/0.120/0.252	1.026/492.7	0.222/0.120/0.252	
2D	1.016/487.8	0.356/0.193/0.405	1.027/493.1	0.197/0.107/0.224	
2E	1.015/487.1	0.374/0.203/0.426	1.024/491.6	0.254/0.138/0.289	
2F	1.0185/488.9	0.306/0.166/0.348	1.0215/490.3	0.306/0.166/0.348	
2G	1.026/492.6	0.183/0.101/0.209	1.036/497.2	0.056/0.030/0.064	
2H	1.011/485.3	0.438/0.245/0.502	1.019/489.3	0.326/0.184/0.374	
2N	0.997/478.5	1.093/0.472/1.191	0.999/479.6	1.093/0.472/1.191	
2P	1.016/487.6	0.502/0.276/0.573	1.024/491.5	0.350/0.192/0.399	

NOTE: The voltages on 480 v MCC buses are correspondingly lower (see atch "C")

CALCULATION SHEET

5010.65

CALCULATION IDENTIFICATION NUMBER				
J.O. OR W.O. NO.	DIVISION & GROUP	CALCULATION NO.	OPTIONAL TASK CODE	PAGE 6
12241	39 / ELECTRICAL	E-86	N/A	

CONCLUSION

For the postulated conditions the system provides acceptable max. voltage level. All of the calculated voltages are below 1.04 pu which corresponds to 104% of nominal voltage for the 4160v equipment and 108.5% for the 460v equipment i.e. less than 110% of the nominal voltage.

ATTACHMENT 3

Outstanding Issue 8(b):

FSAR Section 8.3.1.1.16 indicates that safety-related motors are designed with the capability of accelerating the driven equipment to its rated speed with 80% of motor nameplate voltage applied at the motor terminals. FSAR Section 8.3.1.1.15 indicates that the design of each diesel generator unit is such that at no time during the loading sequence does the voltage decrease to less than 75% of nominal.

In Amendment 3 to the FSAR, the applicant, in response to a request for additional information, indicated that data extrapolated from diesel generator load tests indicated that 79.3% rather than 75% is the largest voltage drop to be expected during the diesel generator load sequence. By letter dated September 7, 1984, the applicant indicated that testing of the diesel generator using actual load and loading sequences to demonstrate its capability will be performed. The applicant stated that it will be shown that, for any case in which the generator voltage dips below 80% of nominal, the recovery time plus the load acceleration time is less than the safe stall time of the load. The results of the staff review of this item will be reported in a supplement to this SER.

Response:

Table 430.23-1 is a partial summary of the actual factor testing of the diesel generators. Test reports (SWEC File Numbers) 2701.300-230-006A, 2702.190-230-006A, and 2702.190-230-015B were reviewed for this information.

Cases IA through IE are the Sequential Load Tests. Case II is taken from the Motor Start Capability Test. Case III is the Margin Test.

Cases IA through IE clearly envelope the diesel generator loading schedule presented in FSAR Table 8.3-3.

Cases IA through IE meet the guidelines of Regulatory Guide 1.9 for frequency, in that at no time during the loading sequence does the frequency decrease to less than 95 percent of nominal, and the frequency is restored to 98 percent of nominal within 60 percent of each load-sequence time interval.

Cases IA through IE meet Regulatory Guide 1.9, although voltage dips to 71%, by recovery to 90% of nominal well within 60% of each load-sequence time interval.

Cases IE, II, and III envelope the instances when the 1250 Hp standby service water pump is energized (note that the 900 Hp service water pump loads will not be present under these scenarios). The standby service water pumps are non-class IE loads fed from the emergency busses, and are designed to operate only upon the loss of the intake structure. During the automatic loading sequence, the standby service water pumps are blocked from starting until the automatic loading sequence of the diesel generators is complete. Then, loading of the standby service water pumps onto the Class IE diesel generator system is by manual action only.

Actual diesel generator loading as indicated in Table 8.3-3 is less than that presented in Cases IA through IE, and consequently voltage levels will be higher and voltage recover to 90% and frequency recovery to 98% will be faster. The motors used in the testing summarized in Table 430.23-1 were 90% and 80% start motors. These motors accelerated to rated speed and continued to run when subsequent loading was applied to the diesel generators.

Therefore, the use of 80% voltage start capability motors, in conjunction with the diesel generator capability and loading schedule, is consistent with Regulatory Guide 1.9.

A calculation has been performed along with other plant voltage profile confirmatory calculations to assure that Class 1E busses can provide minimum required voltage levels at motor terminals when loads are sequenced onto the emergency diesel generators. In addition, the ability of the BVPS-2 diesel generator sets to start and accelerate all of their required loads in accordance with the established loading sequence will be demonstrated in the field by actual test with plant loads, as discussed in response to SER 8.3.1.3, Attachment 4 to 2NRC-4-140.

TABLE 430.23-1

Partial Summary of Diesel Generator Loading Capability

Case	Time (Sec) (Note 1)	Preload Motor/Load	Applied Load	VOLTAGE Minimum Percent	VOLTAGE Recovery Time to 90%	FREQUENCY Minimum Percent	FREQUENCY Recovery Time to 98%
IA	1	0/0	1750HP	71%	.69 sec	99.2%	NA
IB	5	1750HP/0	1100KW	N/C	NA	N/C	NA
IC	10	1750HP/1100KW	1750HP	73.5%	.69 sec	95%	2.75 sec
ID	20	2-1750HP/1100KW	2600KW	N/C	NA	96.6%	3.88 sec
IE	30	2-1750HP/3700KW	2-500HP	81%	< 1/2 sec	96%	2.47 sec
II	NA	1750HP/2000KW	1750HP	72%	.68 sec	93.2%	2.94 sec
III	NA	0/2119KW	1750HP	71%	.72 sec	92%	3.2 sec

Notes:
1) After diesel generator initially reaches rated frequency and voltage
2) N/C - No change
3) NA - Not applicable
4) Each 1750HP motor is a 90% voltage start motor
5) Each 500HP motor is an 80% voltage start motor

ATTACHMENT 4

Outstanding Issue 8(c):

Section 6.4.2 of Institute of Electrical and Electronics Engineers (IEEE) 387-1977 requires, in part, that the load acceptance test consider the potential effects on load acceptance after prolonged no-load or light-load operation of the diesel generator. A load acceptance test or anlaysis that demonstrates the capability of the diesel generator to accept the design accident load sequence after prolonged no-load operation will be pursued with the applicant, and the results will be reported in a supplement to this SER.

Response:

In response to questions 430.25, 430.54, and 430.92, DLC has explained the following:

(a) BVPS-2 procedures require loading of the diesels to at least 25% during testing or maintenance.

(b) When the diesels start automatically, the operator verifies availability of offsite power and immediately returns the units to standby. This limits unloaded running to a very short time period.

(c) The vendor recommends clearing the engine after 24 hours of unloaded running.

Since BVPS-2 operating practices limit the accumulated unloaded running time to far less than 24 hours each month and the diesel is cleared monthly during testing, the diesels will be operated far more conservatively than recommended by the vendor. The attached telex from the vendor documents the ability of the diesels to support the loading sequence following 24 hours of unloaded running.

NOTED AUG 1 1985 L.MONTY

Rcv: @1IM/1.06397 Line: 1

STOWBEN BSN A

COLTFMPTS BELT

AUGUST 1, 1985 3:15 PM 14 PD BELOIT WI

ATTN: LOREN MONTY
SWEC, BOSTON

THE ENGINE CAN OPERATE 24 HRS AT LOW OR NO LOAD AND STILL ACCEPT THE FULL LOADING SEQUENCE.

REGARDS,
JAY JOHNSON
COLT IND-FAIRBANKS MORSE
OUR TELEX #260006
STOWBEN BSN A

COLTFMPTS BELT

Time: 16:18 08/01/85 ???
Connect Time : 72 seconds

ATTACHMENT 5

Outstanding Issue 8(d):

FSAR Section 8.3.1.1.4 and Table 8.3-3 indicate that for a number of Class 1E loads there is a replacement load provided to allow maintenance to be performed while satisfying the single failure criterion. The Beaver Valley design is such that Class 1E load and its replacement may be connected to the same Class 1E power supply at the same time. It is the staff's concern that this simultaneous connection of loads will exceed the capacity of the Class 1E power supplies. Identification of loads involved and design provisions to preclude simultaneous connections will be pursued with the applicant, and the results of the staff's review will be reported in a supplement to this SER.

Response:

The following electrical loads, classified as swing loads (train colored "green"), are able to be electrically connected to either the Class 1E orange or purple bus as described in FSAR Section 8.3.1.1.4 and are depicted on Figure 8.3-1:

1. 2CHS*P21C (Charging Pump), 4,160 V Class 1E
2. 2CCP*P21C (Primary Component Cooling Pump), 4,160 V Class 1E
3. 2SWS*P21C (Service Water Pump), 4,160 V Class 1E
4. 2HVR*FN201C (Containment Air Recirculation Fan), Tripped on CIB Signal (Refer to FSAR Table 8.3-2), 480 V Non-Class 1E

These swing loads are utilized as replacement loads and will be connected to that one bus which has lost its primary load due to failure or maintenance. In that case, an exactly equivalent load is substituted. Administrative procedures will be written to preclude operator connection of any two similar loads on one bus, e.g., both A and C pumps on the orange bus or B and C pumps on the purple bus.

ATTACHMENT 6

Outstanding Issue 8(g):

The staff concludes that redundant penetrations outside the containment are adequately separated with the following exception. Train B purple cables are located in the same penetration room and may also share the same electrical penetration with train A green cables. In addition, justification for noncompliance with IEEE 384-1974 and the independence of penetrations inside the containment were not addressed. These items will be pursued with the applicant, and the results of the staff's review will be reported in a supplement to this SER.

Response:

The statement is not correct that Train A and Train B circuits are run through the same penetration. The same separation criteria are applied both inside and outside containment.

ATTACHMENT 7

Outstanding Issue 8(i):

IEEE 384-1974, as augmented by RG 1.75 (Revision 2), provides minimum raceway separation guidelines acceptable to the staff for complying with the physical independence requirements of GDC 17. These guidelines, however, have not been fully followed in the design of Beaver Valley Unit 2.

By Amendment 9 to the FSAR, by letter dated October 16, 1984, and by proposed revision of FSAR Section 8.3.1.4, the applicant provided additional descriptive information on the design for raceway separation. On the basis of this information, the staff concludes the following:

1. Separation designs depicted on Figures 8.3-17, 8.3-21 (detail B), 8.3-30, 8.3-31, 8.3-32 (detail C), 8.3-33 (detail C), 8.3-36, 8.3-37, 8.3-44, and 8.3-45 meet RG 1.75 and are acceptable.

2. Separation designs depicted on Figures 8.3-16, 8.3-21 (detail A), 8.3-32 (details A and B), and 8.3-33 (details A and B) do not meet the minimum separation guidelines of RG 1.75. Cables are not routed inside enclosed raceways separated by one inch or more. The cables are, however, separated by two metal barriers (solid tray bottom and top) and by a spatial distance of one inch or more. The staff concludes that this design meets RG 1.75 and is acceptable.

3. Separation between redundant Class 1E circuits depicted on Figures 8.3-18 and 8.3-23 does not meet the minimum separation guidelines of RG 1.75. Analysis based on testing to justify the lesser separation will be pursued with the applicant, and the results of the staff review will be reported in a supplement to this SER.

4. Separation between Class 1E and non-Class 1E circuits depicted on the remaining figures (8.3-19, 8.3-20, 8.3-22, 8.3-24, 8.3-25 through 8.3-29, 8.3-34, 8.3-35, 8.3-38 through 8.3-43, 8.3-46, and 8.3-47) does not meet the minimum separation guidelines of RG 1.75. Analysis based on testing to justify the lesser separation will be pursued with the applicant, and the results of the staff review will be reported in a supplement to this SER.

Subsequently, by letter dated January 4, 1985, the applicant presented a proposed test plan for justification os separation arrangements shown on Figures 8.3-22 (details A through D), 8.3-34, 8.3-35, 8.3-38 (detail A), 8.3-39 (detail A), 8.3-42, 8.3-43, 8.3-46 (detail A), and 8.3-47 (detail A) of the FSAR. In addition, a new configuration (which is the same as the configuration shown on FSAR Figure 8.3-18, except that one of the two tray covers shown is removed) was presented for justification by the proposed test plan.

On the basis of its review of the test plan (ESSOW No. 26VS-843, Revision 1, dated December 27, 1984), the staff has identified the following items that require further clarification:

1. Section 1.7.3(b) of the plan indicates that the effect of cable aging has not been addressed. It is the staff concern that the test results

will not substantiate the adequacy of the separation arrangements over the life of the plant.

2. Section 2.3.3 of the plan indicates that tempeature measurements on target cables will only be taken at 2-foot intervals for horizontal arrangements and at 4-foot intervals for vertical arrangements. It is the staff concern that the number of measurements may not be sufficient to conclude that the target cable was not affected.

3. Section 2.5.1 indicates that the basis for acceptance will be that the target cables retain their functional capability. The term "functional capability" has not been defined. Since 5.6.1.2 indicates that one of the test objectives is to demonstrate that a faulted cable will not affect other external cables. The term "will not affect" has not been defined.

4. In Section 1.3 of Appendix 5.15 of the plan, it appears that cables bigger than No. 6 cables were excluded from heat screening tests. The bases and justification for this exclusion need to be clarified.

Each of the above items will be pursued with the applicant, and the results of the staff review will be reported in a supplement to this SER.

Outstanding Issue 8(j):

Power circuits that traverse the cable spreading room at Beaver Valley are installed in rigid or flexible conduit except at the entrance/exits to floor sleeves in the cable spreading room and control room and at the entrance to the equipment in the control room. In accordance with Position C.12 of RG 1.75, this routing should not be considered acceptable. Justification for alternative means of compliance will be pursued with the applicant, and the results of the staff's review will be reported in a supplement to this SER.

Outstanding Issue 8(k):

By letter dated October 16, 1984, and in the proposed FSAR Section 1.8, the applicant identified an exception to Position C.9 of RG 1.75. The applicant has proposed the use of solid high-hat covers as shown on FSAR Figure 8.3-48. The use of high hats is not considered an exception to RG 1.75 unless the separation between trays is further reduced by the high hat. If separation is reduced by the high hat, justification of lesser separation by analysis and test will be pursued with the applicant, and the results of the staff's review will be reported in a supplement to this SER.

Response:

The above questions concerning electrical independence criteria are no longer valid. The installation details in the FSAR have been replaced with those in our letter 2NRC-5-081 dated June 4, 1985. The details in the letter will be included as an amendment to the FSAR and are substantiated by the test report data accompanying the letter.

ATTACHMENT 8

Outstanding Issue 8(m):

The applicant, however, further indicated that the requirements of IEEE 279-1971 other than the single failure criterion of Section 4.2 do not apply. The staff does not agree with this part of the clarification, because items such as periodic testing and calibrations have not been included. Further clarification of this item will be pursued, and the results of the staff review will be reported in a supplement to this SER.

In addition, by letter dated September 20, 1984, the applicant, in response to the issue addressed in Section 8.3.3.5 of this report, indicated that containment electrical penetrations have been determined to be self-protecting or to have two circuit-protective devices. The term "self-protecting" implies exception to Position 1 of RG 1.63. Justification for this exception will be pursued with the applicant, and the results of the staff review will be reported in a supplement to this SER.

Response:

Refer to FSAR Section 1.8 for a discussion of the applicability of RG 1.63 to Beaver Valley Unit 2.

Penetrations which carry instrumentation circuits have been determined to be self-protecting. This means that the penetration can carry the maximum available fault current for these circuits indefinitely without exceeding its thermal limit.

ATTACHMENT 9

Outstanding Issue 11(b):

The applicant was requested to discuss the testing and frequency of testing necessary to maintain and ensure a highly reliable instrumentation, controls, sensors, and alarm system, and to describe what operator actions are required durig alarm conditions to prevent harmful effects to the diesel engine. The applicant has not provided the requested information.

Response:

The responses to Questions 430.69, 430.91, 430.98, 430.110, and 430.121 will be revised as shown on the attached pages.

NRC Letter: September 19, 1983

Question 430.69 (SRP 9.5.4)

In Section 9.5.4.5 of the FSAR you describe the instruments, controls, sensors and alarms provided for monitoring the diesel engine fuel oil storage and transfer system and their function which alert the operator when these parameters exceed the ranges recommended by the engine manufacturer. Discuss the testing and frequency of testing necessary to maintain and assure a highly reliable instrumentation, controls, sensors and alarm system. Describe what operator actions are required during alarm conditions to prevent harmful effects to the diesel engine. Discuss the system interlocks provided (SRP 9.5.4, Part III).

Response:

The reliability of instrumentation, controls, sensors, and alarms will be maintained and assured through the periodic operability testing of the deisel generator units. The specific testing of these items will be addressed in the BVPS-2 operational procedures and will meet the intent of Regulatory Guide 1.108.

BVPS-2 operating procedures will also address actions to be taken in response to alarm conditions. These actions are consistent with the engine manufacturer's guidelines and will prevent damage to the engine.

Interlocks provided for the diesel engine fuel oil storage and transfer system are described in revised Section 9.5.4.5, Amendment 1.

CALIBRATIONS OF DIESEL GENERATOR INSTRUMENTATION WILL BE PERFORMED ON A FREQUENCY DEFINED ON TABLE 430.69-2

WHICH ARE SUMMARIZED IN TABLE 430.69-1

TABLE 430.69-1

Summary of Operator Actions Taken In Response to Diesel Engine Fuel Oil Storage and Transfer System Alarms

a) FUEL OIL PRESS LOW

Check	Action
Operating pressures (locally)	If normal: Attempt to clear alarm; If low, proceed to next check
Suction valve open	Open valve in pump suction line if closed
Filter and strainer differential pressure	If high - see applicable response summary
Day tank level	If low - see applicable response summary
Motor driven pump auto start	If not, confirm: DC AUX FUEL OIL PUMP Control switch in AUTO; Power is available. IF NECESSARY, PLACE DC AUX FUEL OIL PUMP IN "HAND"
Valve lineup to instrumentation and alarm switches	Open valves found in closed position
Piping system integrity from day tank to injectors	If piping is breached or restricted; notify shift supervisor

b) DAY TANK FUEL OIL LEVEL HIGH/LOW

Check	Action
Tank level locally	If normal: Attempt to clear alarm If low: Proceed to next check IF HIGH: PROCEED TO CHECK #4
Verify transfer pump auto start	If not: Check for proper operation of 2EGF-LIS 203A, 203B, 204A, 204B. Control pump manually if required. If running: Confirm valve lineup to day tank.
Piping integrity	If piping is breached or restricted: Notify shift supervisor.
Confirm transfer pump shutoff	If running: Stop pump manually; Monitor day tank level; Prevent low level alarm; Notify I&C to repair level control.

c) STORAGE TANK FUEL OIL LEVEL HIGH/LOW

Check	Action
Tank level	If normal: Attempt to clear alarm. If low: Proceed to next check. IF HIGH: PROCEED TO CHECK #3.
Tank and piping integrity	Notify shift supervisor. If leaks or obstructions are found Isolate if possible
Storage tank being filled-level high	STOP FILLING TANK. INFORM SHIFT SUPERVISOR.
Storage tanks not being filled-level high	INFORM SHIFT SUPERVISOR. SEARCH FOR IN-LEAKAGE.

TABLE 430.69-1

d) FUEL OIL TRANSFER PUMP DISCH STRAIN 39 (40)(41)(42) D/P HIGH

Check	Action
Confirm high strainer dP	If normal: Attempt to clear alarm. If high: Confirm instrumentation valve lineup; REMOVE ASSOCIATED PUMP FROM SERVICE. CLEAN STRAINER, RETURN PUMP TO SERVICE.

TABLE 430.69-2

Equip. ID	Service	Calib. Frequency
2EGF-DI201-1	Fuel Oil Filter Differential Pressure	36 mo.
2EGF-DI201-2	Fuel Oil Filter Differential Pressure	36 mo.
2EGF-DIS201A	F. O. Transfer Pump P21A Disch. Strainer High DP Alarm	36 mo.
2EGF-DIS201B	F. O. Transfer Pump P21B Disch. Strainer High DP Alarm	36 mo.
2EGF-DIS201C	F.O. Transfer Pump P21C Disch. Strainer High DP Alarm	36 mo.
2EGF-DIS201D	F.O. Transfer Pump P21D Disch Strainer High DP Alarm	36 mo.
2EGF-LG201	Day Tank TK22A Level	N/A
2EGF-LG202	Day Tank TK22B Level	N/A
2EGF-LI202A	Day Tank TK22A Level	36 mo.
2EGF-LI202B	Day Tank TK22B Level	36 mo.
2EGF-LIS201A	F.O. Storage Tank TK21A Hi/Lo Level Alarm	18 mo.
2EGF-LIS201B	F.O. Storage Tank Tk21B Hi/Lo Level Alarm	18 mo.
2EGF*LIS203A	F.O. Day Tank TK22A Level Control	18 mo.
2EGF*LIS203B	F.O. Day Tank TK22B Level Control	18 mo.
2EGF*LIS204A	F.O. Day Tank TK22A Level Control	18 mo.
2EGF*LIS204B	F.O. Day Tank TK22B Level Control	18 mo.
2EGF-LIS205A	F.O. Day Tank TK22A Hi/Lo Alarm	36 mo.
2EGF-LIS205B	F.O. Day Tank TK22B Hi/Lo Alarm	36 mo.
2EGF-LS200A	F.O. Day Tank Tk22A Sump Pit Level Alarm	36 mo.
2EGF-LS200B	F.O. Day Tank TK22B Sump Pit Level Alarm	36 mo.
2EGF-NBE121A	Vibration Monitoring	N/A
2EGF-NBE121B	Vibration Monitoring	N/A
2EGF-NBE121C	Vibration Monitoring	N/A
2EGF-NBE121D	Vibration Monitoring	N/A
2EGF-PI201A	F.O. Transfer Pump P21A Disch Pressure	36 mo.
2EGF-PI201B	F.O. Transfer Pump P21B Disch Pressure	36 mo.
2EGF-PI201C	F.O. Transfer Pump P21C Disch Pressure	36 mo.
2EGF-PI201D	F.O. Transfer Pump P21D Disch Pressure	36 mo.
2EGF*PS202-1	F.O. Pressure Lo Alarm/Aux. Pump P22A Auto Start	18 mo.
2EGF*PS202-2	F.O. Pressure Lo Alarm/Aux. Pump P22B Auto Start	18 mo.

NRC Letter: September 19, 1983

Question 430.91 (Section 9.5.5, SRP 9.5.6)

In Section 9.5.5.5 of the FSAR, you describe the instrumentation, controls, sensors, and alarms provided for monitoring of the diesel engine cooling water system and their functions which alert the operator when these parameters exceed the ranges recommended by the engine manufacturer. Discuss the testing and frequency of testing necessary to maintain and assure a highly reliable instrumentation, controls, sensors, and alarm system. Describe what operator actions are required during alarm conditions to prevent harmful effects to the diesel engine. Discuss the system's interlocks provided (SRP 9.5.6, Part III).

Response:

The reliability of instrumentation, controls, sensors, and alarms will be maintained and assured through the periodic operability testing of the diesel generator units. The specific testing of these items will be addressed in the BVPS-2 operational procedures and will meet the intent of Regulatory Guide 1.108.

The BVPS-2 operating procedures will also address actions to be taken in response to alarm conditions. These actions are consistent with the engine manufacturer's guidelines and will prevent damage to the diesel engine.

Interlocks provided for the diesel generator cooling water system are described in Section 9.5.5.5.

CALIBRATIONS OF DIESEL GENERATOR INSTRUMENTATION ... WILL BE PERFORMED ON A FREQUENCY DEFINED ON TABLE 430.91-2.

WHICH ARE SUMMARIZED IN TABLE 430.91-1

TABLE 430.91-1

SUMMARY OF OPERATOR ACTIONS IN RESPONSE TO DIESEL ENGINE COOLING WATER SYSTEM ALARMS

a) JACKET COOLANT PRESS. LOW

Check	Action
Instrument valve lineup	Open valves to switch and gauge if closed
Pressure indication	If normal: Attempt to clear alarm If low: Proceed to next check
Piping and flex coupling integrity	If leaks or obstructions exist, notify maintenance to repair
Engine driven pump operability	Notify maintenance to repair

b) JACKET COOLANT TEMP. HIGH

Check	Action
Operating Temperature indicators	If normal: Attempt to clear alarm If high: Proceed to next check
Operation of temp. control valve	Notify maintenance to repair when possible
Engine driven pump operability	Notify maintenance to repair when possible
Flow of water	Open SERVICE WATER VALVES IF CLOSED.

TABLE 430.91-1

c) JACKET COOLANT TEMP LOW

Check	Action
Operating temperature indicators	If normal: Attempt to clear alarm. If low: Proceed to next check
During engine operation: Operation of temp. control valve	Fail open design may cause this condition; Notify maintenance to repair when possible
During standby: Operation of keep-warm pump and heater	Notify maintenance to repair

d) JACKET COOLANT LEVEL LOW

Check	Action
LS 201-1 (2) operating properly	If normal: Attempt to clear alarm If low: Proceed to next check
Makeup demineralized water is available	OPEN FILL ISOLATION VALVE [[illegible]-65-1 (2)] UNTIL DESIRED TANK LEVEL IS REACHED. CLOSE FILL ISOLATION VALVE.
Drain valve position	Close drain valve and cap discharge pipe if leak exists
Piping and flex coupling integrity	Notify maintenance to repair when possible
Lube oil sump for high level	If high, check for water in lube oil. If present, notify maintenance to repair.

TABLE 430.91-2

Equip. ID	Service	Calib. Frequency
2EGS-LG201-1	Jacket Water Exp. Tank TK1A Level	N/A
2EGS-LG201-2	Jacket Water Exp. Tank TK1B Level	N/A
2EGS-LS201-1	Jacket Water Exp. Tank TK1A Low Level Alarm	18 mo.
2EGS-LS201-2	Jacket Water Exp. Tank TK1B Low Level Alarm	18 mo.
2EGS-PI200-1	Jacket Water Pump P22A Disch. Pressure	36 mo.
2EGS-PI200-2	Jacket Water Pump P22B Disch. Pressure	36 mo.
2EGS*PS100A	DG2-1 Cooling Water Pressure	18 mo.
2EGS*PS100B	DG2-2 Cooling Water Pressure	18 mo.
2EGS*PS210-1	DG2-1 Jacket Water Low Pressure Alarm	18 mo.
2EGS*PS210-2	DG2-2 Jacket Water Low Pressure Alarm	18 mo.
2EGS*TH205-1	DG2-1 Jacket Coolant Temp Control	13 mo.
2EGS*TH205-2	DG2-2 Jacket Coolant Temp Control	18 mo.
2EGS*TS204-1	DG2-1 Jacket Water Low Temp. Alarm	18 mo.
2EGS*TS204-2	DG2-2 Jacket Water Low Temp. Alarm	18 mo.
2EGS*TS213-1	DG2-1 Jacket Water Hi Temp Alarm & Shutdown	18 mo.
2EGS*TS213-2	DG2-2 Jacket Water Hi Temp. Alarm & Shutdown	18 mo.
2EGS-PI201-1	DG2-1 Service Water Pressure	36 mo.
2EGS-PI201-2	DG2-2 Service Water Pressure	36 mo.
2EGS-TI201-1	DG2-1 Jacket Water Temp to Oil	36 mo.
2EGS-TI201-2	DG2-2 Jacket Water Temp to Oil	36 mo.
2EGS*TS214-1	DG2-1 Jacket Water Hi Temp Alarm	18 mo.
2EGS*TS214-2	DG2-2 Jacket Water Hi Temp Alarm	18 mo.
2EGS*TT216-1	DG2-1 Jacket Water Temp Control	18 mo.
2EGS*TC216-1	DG2-1 Jacket Water Temp Control	18 mo.
2EGS*TCV216-1	DG2-1 Jacket Water Temp Control	18 mo.
2EGS*TT216-2	DG2-2 Jacket Water Temp Control	18 mo.
2EGS*TC216-2	DG2-2 Jacket Water Temp Control	18 mo.
2EGS*TCV216-2	DG2-2 Jacket Water Temp Control	18 mo.
2EGS-TI205-1	DG2-1 Service Water Temp Out	36 mo.
2EGS-TI205-2	DG2-2 Service Water Temp Out	36 mo.
2EGS-TI208-1	DG2-1 Jacket Water Temp From Engine	36 mo.
2EGS-TI208-2	DG2-2 Jacket Water Temp From Engine	36 mo.
2EGS-TI211-1	DG2-1 Service Water Temp To Intercooler Water	36 mo.
2EGS-TI211-2	DG2-2 Service Water Temp to Intercooler Water	36 mo.
2EGS*TI203-1	DG2-1 Intercooler Heat Exchanger In/Out Temp	36 mo.
2EGS*TI203-2	DG2-2 Intercooler Heat Exchanger In/Out Temp	36 mo.

NRC Letter: September 19, 1983

Question 430.98 (Section 9.5.6)

Describe the instrumentation, controls, sensors, and alarms provided for monitoring the diesel engine air starting system, and describe their function. Describe the testing necessary to maintain a highly reliable instrumentation, control, sensors, and alarm system and where the alarms are annunciated. Identify the temperature, pressure and level sensors which alert the operator when these parameters exceed the ranges recommended by the engine manufacturer and describe any operator actions required during alarm conditions to prevent harmful effects to the diesel engine. Discuss system interlocks provided. Revise your FSAR accordingly (SRP 9.5.6, Part III).

Response:

Refer to revised Section 9.5.6.5, Amendment 4, for a description of the instrumentation, controls, sensors, and alarms.

The reliability of instrumentation, controls, sensors, and alarms will be maintained and assured through the periodic operability testing of the diesel generator units. The specific testing of these items will be addressed in the BVPS-2 operational procedures and will meet the intent of Regulatory Guide 1.108. ← INSERT 1 PAGE 430.98-2

Refer to revised Section 9.5.6.5, Amendment 4, for a description of the sensors that alert the operator and the location of alarms that are annunciated.

INSERT 2 PAGE 430.98-2

BVPS-2 operating procedures will also address actions to be taken in response to alarm conditions. These actions are consistent with the engine manufacturer's guidelines and prevent damage to the diesel engine.

Interlocks provided for the diesel generator air starting system are described in revised Section 9.5.6.5, Amendment 4.

At a meeting on March 6, 1984, the NRC requested BVPS-2 to verify that the operator is not precluded from starting the emergency diesel generator by a fuel interlock (timed retention of fuel isolation signal), thus creating the possibility of expending the supply of starting air. The control logic prevents energization of the starting solenoids (admits starting air) while the shutdown solenoids are energized. Should an emergency start signal be initiated within the time that the shutdown time retention was in effect, the emergency start signal will override the shutdown circuit and the diesel will start. If the diesel were manually tripped while an emergency start signal was present, the shutdown circuit can be reset by depressing the start pushbutton at the location of control. This will allow deenergization of the shutdown solenoids (admits fuel to

engine) as well as allow air start solenoids to be energized and admi: air to the air start system.

INSERT 1

CALIBRATIONS OF DIESEL GENERATOR INSTRUMENTATION WILL BE PERFORMED ON A FREQUENCY DEFINED ON TABLE 430.98-2.

INSERT 2

WHICH ARE SUMMARIZED ON TABLE 430.98-1

TABLE 430.98 -1

Summary of Operator Actions or Response to Diesel Engine Air Starting System Alarms

a) RSVR #1 (2) STARTING AIR PRESS LOW

Check	Action
Air header pressure	If normal: check valve lineup to sensors Attempt to clear alarm
	If low: Proceed to next step
Receiver pressure	If normal: Check valve lineup to air Start distributors
	If low: Proceed to next step
Valve lineup to receivers	Open valves if closed
Compressor running	If stopped: Confirm valve lineup to start switch ensure power to compressor
Piping and flex Coupling	If leaks or obstructions exist: Isolate leak if possible Notify shift supervisor

b) Start Failure

Check	Action
Barring device	If engaged: Check reason for engagement Disengage when possible
Engine SHUTDOWN RELAY	Ensure shutdown has been reset

TABLE 430.97-1

Control power available	IF CONTROL CIRCUIT FAILURE IS ALARMED Notify maintenance if repairs are required
SELECTOR switch position (2EGS*EG2-1(2))	IF switch is not in REMOTE: Check reason for position Return to REMOTE when possible
Fuel system	If fuel system problems exist, respond in accordance with applicable alarm response
Air intake system	Check condition of air intake filters, piping, flex connectors, and intake manifolds.

If the diesel still fails to start, manually start at:
Control room panel
EMERGENCY SHUTDOWN PANEL
local engine panel
ALTERNATE SHUTDOWN PANEL

c) BARRING DEVICE ENGAGED

Check	Action
Position of BARRING DEVICE	If switch is ENGAGED: Check reason for DEVICE position Return to DISENGAGED when possible
	IF DEVICE IS DISENGAGED, ATTEMPT TO CLEAR ALARM

TABLE 430.98-2

Equip ID	Service	Calib. Frequency
2EGA-PI201	DG2-1 Starting Air Tank TK21A Pressure	36 mo.
2EGA-PI202	DG2-2 Starting Air Tank TK21B Pressure	36 mo.
2EGA-PI203	DG2-1 Starting Air Tank TK22A Pressure	36 mo.
2EGA-PI204	DG2-2 Starting Air Tank TK22B Pressure	36 mo.
2EGA-PI205-1	DG2-1 Air Receiver Pressure Differential	36 mo.
2EGA-PI205-2	DG2-2 Air Receiver Pressure Differential	36 mo.
2EGA*PS201	DG2-1 Air Compressor C21A Control	18 mo.
2EGA*PS202	DG2-2 Air compressor C21B Control	18 mo.
2EGA*PS203	DG2-1 Air Compressor C22A Control	18 mo.
2EGA*PS204	DG2-2 Air compressor C22B Control	18 mo.
2EGA*PS205-1	DG2-1 Start Air Pressure Low Alarm	18 mo.
2EGA*PS205-2	DG2-2 Start Air Pressure Low Alarm	18 mo.
2EGA*PS206-1	DG2-1 Start Air Pressure Low Alarm	18 mo.
2EGA*PS206-2	DG2-2 Start Air Pressure Low Alarm	18 mo.

NRC Letter: September 19, 1983

Question 430.110 (Section 9.5.7)

In Section 9.5.75 of the FSAR you describe the instrumentation, controls, sensors, and alarms provided for monitoring the diesel engine lubrication oil system and their function which alerts the operator when these parameters exceed the ranges recommended by the engine manufacturer. Describe the testing and frequency of testing necessary to maintain a highly reliable instrumentation, control, sensors, and alarm system. Describe any operator action required during alarm conditions to prevent harmful effects to the diesel engine. Discuss systems interlocks provided. Revise your FSAR accordingly (SRP 9.5.7, Part III).

Response:

The reliability of instrumentation, controls, sensors, and alarms will be maintained and assured through the periodic operability testing of the diesel generator units. The specific testing of these items will be addressed in the BVPS-2 operational procedures and will meet the intent of Regulatory Guide 1.108.

The BVPS-2 operating procedures will also address actions to be taken in response to alarm conditions. These actions are consistent with the engine manufacturer's guidelines and will prevent damage to the diesel engine.

The system interlocks provided are discussed in Section 9.5.7.5.

CALIBRATIONS OF DIESEL GENERATOR INSTRUMENTATION WILL BE PERFORMED ON A FREQUENCY DEFINED ON TABLE 430.110-2.

WHICH ARE SUMMARIZED ON TABLE 430.110-1

TABLE H30.110-1

Summary of Operator Actions in Response to Diesel Engine Lubricating Oil System Alarms

a) LUBE OIL TEMP. HIGH

Check	Action
Lube Oil Temperature	If normal: Attempt to clear alarm. If high, proceed to next step.
JACKET WATER flow through cooler	Open 2EGS*TCV216-1(2) if closed.
Proper operation of temperature control valve	Notify maintenance to repair.

b) CRANKCASE LUBE OIL LEVEL HIGH

Check	Action
Crankcase level	If normal: Attempt to clear alarm. If high: Proceed to next step.
Crankcase level trend, and jacket water expansion tank level trend.	Check oil quality for water contamination, manually drain if required, and notify maintenance to repair.

c) LUBE OIL LEVEL LOW

Check	Action
Crankcase level	If normal: Attempt to clear alarm. If low: Gravity fill crankcase to clear alarm.
Crankcase level trend	If level drops abnormally fast, check for leakage into jacket water system (high J.W. expansion tank level), and piping integrity. If leaks found, notify maintenance to repair.

d) LUBE OIL PRESS LOW

Check	Action
Operating pressure	If normal: Attempt to clear alarm. If low: Proceed to next check.
Strainer and filter dP	If high, refer to applicable response.
Piping integrity	If breaks or obstructions are found: Attempt to isolate leak or free obstruction; Notify shift supervisor.
Valve lineup to instrumentation	Open valves if closed.
Pump operation	

e) LUBE OIL TEMP LOW

Check	Action
Lube oil temperature	If normal: Attempt to clear alarm. If low: Proceed to next check.
During engine operation: Operation of temperature control valve	If valve fails open, may cause low temperature under certain conditions
During standby conditions: Operation of keep-warm pump and heater	If inoperable, notify maintenance for repair

f) ROCKER ARM LUBE OIL LEVEL HIGH

Check	Action
Operation of tank level control valve	Confirm linkage and valve actuator are not bound.
Tank overflow	If overflow occurs, manually control tank level.

TABLE 430.110-1

g) ROCKER ARM LUBE OIL PRESS LOW

Check	Action
Instrumentation valve lineup	Open high pressure switch isolation valve if closed.
Duplex L.O. filter differential pressure	Swap and clean filter, if differential pressure is high.
Confirm motor-driven pump start	If prelube pump has not started, manually start to clear alarm.
Pressure relief valve	Confirm PSV is not stuck open.
System integrity	Isolate leaks if possible.

h) CRANKCASE PRESSURE HIGH

Check	Action
Crankcase pressure	If normal: Attempt to clear alarm If high: Proceed to next step.
Instrument valve Lineup	Open isolation valve if closed.
Operation of crankcase vacuum pump.	If inoperable, notify maintenance to repair when possible.
Piping integrity	If breaks found, attempt to isolate leak (vacuum leak). Notify maintenance to repair when possible.
Lube oil quality for water contamination. (Excessive water in oil sump during operation can result in loss of vacuum).	Notify maintenance to repair when possible.

TABLE 430.110-2

Equip ID	Service	Calib. Frequency
2EGO-DI202-1	DG2-1 Oil Filter Differential	36 mo.
2EGO-DI202-2	DG2-2 Oil Filter Differential	36 mo.
2EGO-DI201-1	DG2-1 Lube Oil Strainer Differential	36 mo.
2EGO-DI201-2	DG2-2 Lube Oil Strainer Differential	36 mo.
2EGO*LS210-1	DG2-1 Engine Sump Lube Oil Low Level Alarm	18 mo.
2EGO*LS210-2	DG2-2 Engine Sump Lube Oil Low Level Alarm	18 mo.
2EGO*LS211-1	DG2-1 Engine Sump Lube Oil High Level Alarm	18 mo.
2EGO*LS211-2	DG2-2 Engine Sump Lube Oil High Level Alarm	18 mo.
2EGO*LS212-1	DG2-1 Rocker Arm Oil Reservoir Hi Alarm	18 mo.
2EGO*LS212-2	DG2-2 Rocker Arm Oil Reservoir Hi Alarm	18 mo.
2EGO-PI201-1	DG2-1 Lube Oil Pressure	36 mo.
2EGO-PI201-2	DG2-2 Lube Oil Pressure	36 mo.
2EGO*PS201-1	DG2-1 Lube Oil Pressure Alarm and shutdown	18 mo.
2EGO*PS201-2	DG2-1 Lube Oil Pressure Alarm and shutdown	18 mo.
2EGO*PS201-3	DG2-1 Lube Oil Pressure Alarm and shutdown	18 mo.
2EGO*PS201-4	DG2-1 Lube Oil Pressure Alarm and shutdown	18 mo.
2EGO*PS202-1	DG2-2 Lube Oil Pressure Alarm and shutdown	18 mo.
2EGO*PS202-2	DG2-2 Lube Oil Pressure Alarm and shutdown	18 mo.
2EGO*PS202-3	DG2-2 Lube Oil Pressure Alarm and shutdown	18 mo.
2EGO*PS202-4	DG2-2 Lube Oil Pressure Alarm and shutdown	18 mo.
2EGO*PS211-1	DG2-1 Rocker Arm Lo Pressure Alarm	18 mo.
2EGO*PS211-2	DG2-2 Rocker Arm Lo Pressure Alarm	18 mo.
2EGO*TH213-1	DG2-1 Lube Oil Heater Control	18 mo.
2EGO*TH213-2	DG2-1 Lube Oil Heater Control	18 mo.
2EGO-TI205-1	DG2-1 Lube oil Temp from Engine Sump	36 mo.
2EGO-TI205-2	DG2-2 Lube Oil Temp from Engine Sump	36 mo.
2EGO-TI206-1	DG2-1 Lube Oil Temp. to Engine	36 mo.
2EGO-TI206-2	DG2-2 Lube oil Temp. to Engine	36 mo.
2EGO*TS209-1	DG2-1 Lube oil Temp. high shutdown	18 mo.
2EGO*TS209-2	DG2-2 Lube Oil Temp high shutdown	18 mo.
2EGO*TS210-1	DG2-1 Lube Oil Temp High Alarm	18 mo.
2EGO*TS210-2	DG2-1 Lube Oil Temp high Alarm	18 mo.
2EGO*TS212-1	DG2-1 Engine sump Lo Temp Alarm	18 mo.
2EGO*TS212-2	DG2-2 Engine sump Lo Temp Alarm	18 mo.
2EDG-PI210-1	DG2-1 Crankcase Manometer	36 mo.
2EDG-PI210-2	DG2-2 Crankcase Manometer	36 mo.
2EDG*PS210-1	DG2-1 Crankcase Pressure Alarm	18 mo.
2EDG*PS210-2	DG2-2 Crankcase Pressure Alarm	18 mo.

NRC Letter: September 19, 1983

Question 430.121 (Section 9.5.8)

In Section 9.5.8.5 of the FSAR you describe the instrumentation, controls, sensors, and alarms provided in the design of the diesel engine combustion air intake and exhaust system and their function which alert the operator when parameters exceed ranges recommended by the engine manufacturer. Discuss the testing and frequency of testing necessary to maintain and assure a highly reliable instrumentation, controls, sensors, and alarm system and where the alarms are annunciated. Describe any operator action required during alarm conditions to prevent harmful effects to the diesel engine. Discuss systems interlocks provided. Revise your FSAR accordingly (SRP 9.5.8, Part III).

Response:

The diesel engine combustion air intake and exhaust system is a passive system which does not require controls, alarms, or annunciation. The reliability of instrumentation will be maintained and assured through the periodic operability testing of the diesel generator units. The specific testing of the instrumentation will be addressed in the BVPS-2 operational procedures and will meet the intent of Regulatory Guide 1.108.

The diesel engine combustion air intake and exhaust system is not provided with any interlocks. Refer to Section 9.5.8.5.

CALIBRATIONS OF DIESEL GENERATOR INSTRUMENTATION WILL BE PERFORMED ON A FREQUENCY DEFINED ON TABLE 430.121-2.

TABLE 430.121-2

Equip. ID	Service	Calib. Frequency
2EDG-PI200	DG2-2 Pressure Manometer Air Intake	36 mo.
2EDG-PI201	DG2-1 Pressure Manometer Air Intake	36 mo.
2EDG-PI201-1	DG2-1 Combustion Air Manifold Differential	36 mo.
2EDG-PI201-2	DG2-2 Combustion Air Manifold Differential	36 mo.
2EDG-TE201-1	DG2-1 Cylinder Temp	N/A
2EDG-TE201-2	DG2-1 Cylinder Temp	N/A
2EDG-TE201-3	DG2-1 Cylinder Temp	N/A
2EDG-TE201-4	DG2-1 Cylinder Temp	N/A
2EDG-TE201-5	DG2-1 Cylinder Temp	N/A
2EDG-TE201-6	DG2-1 Cylinder Temp	N/A
2EDG-TE201-7	DG2-1 Cylinder Temp	N/A
2EDG-TE201-8	DG2-1 Cylinder Temp	N/A
2EDG-TE201-9	DG2-1 Cylinder Temp	N/A
2EDG-TE201-10	DG2-1 Cylinder Temp	N/A
2EDG-TE201-11	DG2-1 Cylinder Temp	N/A
2EDG-TE201-12	DG2-1 Cylinder Temp	N/A
2EDG-TE203-1	DG2-1 Exhaust Temp	N/A
2EDG-TE203-2	DG2-2 Exhaust Temp	N/A
2EDG-TE202-1	DG2-2 Cylinder Temp	N/A
2EDG-TE202-2	DG2-2 Cylinder Temp	N/A
2EDG-TE202-3	DG2-2 Cylinder Temp	N/A
2EDG-TE202-4	DG2-2 Cylinder Temp	N/A
2EDG-TE202-5	DG2-2 Cylinder Temp	N/A
2EDG-TE202-6	DG2-2 Cylinder Temp	N/A
2EDG-TE202-7	DG2-2 Cylinder Temp	N/A
2EDG-TE202-8	DG2-2 Cylinder Temp	N/A
2EDG-TE202-9	DG2-2 Cylinder Temp	N/A
2EDG-TE202-10	DG2-2 Cylinder Temp	N/A
2EDG-TE202-11	DG2-2 Cylinder Temp	N/A
2EDG-TE202-12	DG2-2 Cylinder Temp	N/A
2EDG-TE204-1	DG2-1 Exhaust Temp	N/A
2EDG-TE204-2	DG2-2 Exhaust Temp	N/A
2EDG-TI201-1	DG2-1 Temp	N/A
2EDG-TI201-2	DG2-2 Temp	N/A

ATTACHMENT 10

Outstanding Issue 11(f):

FSAR Section 8.3 states that in the event of a loss of offsite power (LOOP) the diesel generator room ventilation system must be manually reconnected to the bus. The diesel generator room ventilation system provides cooling to the diesel generator and its auxiliary equipment during diesel generator operation. Failure to restore the ventilation system to operating condition within a reasonable amount of time will result in diesel generator room temperatures exceeding the 120°F design ambient temperature specified in FSAR Section 9.5.4. In a response to the staff's request for information on this aspect of the design, the applicant stated that "operation of the primary and secondary supply fans, normal exhaust fans, and associated motorized dampers is maintained during loss of normal station power by automatic connection to the emergency buses." However, FSAR Table 8.3-3, "Emergency Diesel Generator Loading," only shows that the supply of fans and heaters are connected to the buses and not the other equipment.

Response:

Table 8.3-3 is being revised to reflect the present loading which includes the normal exhaust fan (2HVD*FN222A), the primary supply fan (2HVD*FN-270A), and the secondary supply fan (2HVD* FN271A). These loads have been included in the existing diesel loading calculation. The associated motor operated dampers (2HVD*MOD21A, 22A, 23A) are fed from a 120 V ac distribution transformer (TRF*PWR-E1). The table does not indicate individual loads at the 120 V level. Instead, they are included in the total load indicated for the relevant distribution transformer (TRF*PWR-E1 in this case).

ATTACHMENT 11

Outstanding Issue 12(a):

Inspection of the extraction steam valves is needed to ensure that the check valve closing mechanism travels in the closing direction in a free and positive manner. This is to alleviate the concern of a turbine overspeed resulting from back flow of steam from extraction feedwater heaters. In Amendment 8 of the FSAR, the applicant described the inservice inspection program for the mechanical and backup overspeed trips only.

Response:

The BVPS Operating Manual requires all extraction steam nonreturn valves to have been tested within one week prior to each turbine startup. This test consists of a visual verification of valve stroking in a test latch/unlatch sequence. DLC operating experience has shown this testing is adequate to assure stable turbine speeds following a trip.

ATTACHMENT 12

Unnumbered Outstanding Issue (Pages 9-74 and 9-75):

Automatic controls are provided to automatically start and stop each air compressor when the pressure in its respective air receivers decreases or increases to predetermined levels. The applicant has not provided the requested setpoints for the compressor cutin and cutout pressures as well as the high-pressure, low-pressure, and low-low pressure alarm setpoints.

Response:

Thse values are provided in FSAR Table 9.5-10. No high pressure or low-low pressure alarms are used at BVPS-2.

ATTACHMENT 13

Backfit Issue 14:

DLC was requested informally by PSB to discuss checks and/or tests including frequencies, which assure adequate air dryer performance.

Response:

Performance of the air dryers is assured by routine daily checks by the operators and a maintenance program based upon vendor recommendations and included in approved plant procedures. The BVPS-2 surveillances will include: 1) a daily blowdown of each diesel generator's air receivers and noting of any water volume obtained and 2) performance of maintenance surveillance procedures at each refueling outage to inspect the air start solenoid valves.

In addition, an alarm is provided which alerts the control room operators to a "high dewpoint temperature." This alarm is annunciated and the operator will respond as directed in the approved alarm response procedure.