SOUTHERN CALIFORNIA
EDISON
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Dwight E. Nunn
Vice President

May 24, 2000

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555

Subject: **Docket Nos. 50-361 and 50-362**
Response to Request for Additional Information Regarding
Proposed Technical Specification Change Number 454
San Onofre Nuclear Generating Station Units 2 and 3

References:

1. Letter dated November 8, 1999, from D. E. Nunn (SCE) to Document Control Desk (NRC), Subject: Docket Nos 50-361 and 50-362, Engineered Safety Features Timing, Proposed Technical Specification Change NPF-10/15-454, San Onofre Nuclear Generating Station, Units 2 and 3

2. Letter dated January 18, 2000, from L. Raghavan (NRC) to H. B. Ray (SCE), Subject: San Onofre Nuclear Generating Station, Units 1, 2, and 3 - Request For Additional Information On Technical Specification Surveillance Requirement Change re: AC Sources Operating (TAC Nos. MA7153 and M7154)

3. Letter dated March 16, 2000, from D. E. Nunn (SCE) to Document Control Desk (NRC), Subject: Docket Nos 50-361 and 50-362, Response to Request for Additional Information Regarding Proposed Technical Specification Change Number 454, San Onofre Nuclear Generating Station Units 2 and 3

Gentlemen:

By Reference 1, Southern California Edison submitted license Amendment Applications 191 and 176 for San Onofre Nuclear Generating Station Units 2 and 3 (SONGS 2 & 3), respectively. These Amendment Applications comprise Proposed Change Number 454 (PCN-454) to the SONGS 2 & 3 Technical Specifications requesting a revision to the acceptance criteria for the Agastat time delay relays used in the Engineered Safety Features load sequencer in Surveillance Requirement 3.8.1.18.

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A001

NRR-057

By Reference 2, NRC staff requested additional information to facilitate their review of our application. Our response was provided in Reference 3.

Subsequently, NRC staff reviewers requested further information. Our response is provided in the enclosures.

If you have further questions on this subject, please contact me or Jack Rainsberry at (949) 368-7420.

Sincerely,

Enclosures

cc: E. W. Merschoff, Regional Administrator, NRC Region IV
J. A. Sloan, NRC Senior Resident Inspector, San Onofre Units 2 & 3
L. Raghavan, NRC Project Manager, San Onofre Units 2 and 3
S. Y. Hsu, California Department of Health Services

Subscribed on this 24th day of May, 2000.

Respectfully submitted,
SOUTHERN CALIFORNIA EDISON COMPANY

By: Dwight E. Nunn

State of California
County of San Diego

On 5/24/2000 before me, Frances M. Thurber,

personally appeared Dwight E. Nunn, personally known to me to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

Signature Frances M Thurber

FRANCES M. THURBER
Commission # 1130906
Notary Public — California
San Diego County
My Comm. Expires Mar 28, 2001

ENCLOSURE 1

SAN ONOFRE NUCLEAR GENERATING STATION
UNITS 2 AND 3
RESPONSES TO SECOND NRC REQUEST
FOR ADDITIONAL INFORMATION
ON PCN-454

REQUEST FOR ADDITIONAL INFORMATION (RAI) QUESTION 1:

When is the editorial error in calculation E4C-082 going to be corrected?

RESPONSE:

CCN 35 to E4C-082 was issued on April 26, 2000 to correct the editorial error.

RAI QUESTION 3:

Clarify if the momentary load surges are within the short time (identify) rating of the diesel generators. If the load surges exceed the rating, identify how many times and by what amount.

RESPONSE:

Sheet 12 of CCN 9 to calculation E4C-082 shows that the maximum transient power output of diesel generator 2G002 exceeds the 2 hour rating of 5170 KW only during the last sequence step. The diesel generator has a one minute rating of 8550 KW (150%) per NEMA Standard MG 1. Moreover, the load surges do not exceed the diesel generator 2 hour rating during load sequencing tests. Therefore, the momentary load surge is acceptable.

RAI QUESTION 5:

An NRC staff reviewer had difficulty relating the acceptability of values in Table 3.1 of PCN-454 and Table 8.3-1 of the Updated Final Safety Analysis Report (UFSAR), and why a difference in values was acceptable and conservative. In an April 12, 2000 telephone conversation between the reviewer and members of the San Onofre engineering staff, the specific example of Motor Control Center (MCC) 2BD was discussed seemingly to the reviewer's satisfaction. The reviewer asked for two or three additional examples to verify that the loads used in calculation E4C-082 are conservative if lower loads than those listed in Table 8.3-1 of the UFSAR are used.

RESPONSE:

CCN 9 to calculation E4C-082 categorized MCC loads as LUMPED STATIC LOAD, LUMPED MOTOR LOAD and CMOTOR MODEL LOAD. Table 3.1 of CCN 9 to calculation E4C-082 shows only accident condition equivalent static loads and initial condition equivalent loads. CMOTOR MODEL loads are not included in the table. The CMOTOR MODEL loads are starting motors during sequencing. The rpm and terminal voltage of the CMOTOR MODEL loads are monitored in this calculation.

As shown in the table below, MCC loads used in CCN 9 to calculation E4C-082, which includes LUMPED STATIC LOAD, LUMPED MOTOR LOAD and CMOTOR MODEL

LOAD, are greater than MCC loads listed in UFSAR Table 8.3-1. (Revision 15 of UFSAR Table 8.3-1 is provided in Enclosure 2 to this response.)

MCC	Load		Remarks
	UFSAR Table 8.3-1	CCN 9 to E4C-082	
2BD	163.7 KW + j109.9 KVAR	174.9 KW + j120.9 KVAR	Sheet 351 of CCN 9 to E4C-082
2BRA	1.7 KW +j 1.1 KVAR	22.2 KW + j13.9 KVAR	Sheet 351 of CCN 9 to E4C-082
2BE	88.4 KW + j37.7 KVAR	142 KW + j97.1 KVAR	Sheet 352 of CCN 9 to E4C-082
2BY	210.8 KW + j134.3 KVAR	214.6 KW + j139.3 KVAR	Sheet 352 of CCN 9 to E4C-082

In addition, the total load of the diesel generators used in CCN 9 to calculation E4C-082 (sheet 348) exceeds the loading shown in the UFSAR Table 8.3-1, and the motor data used in this CCN envelops the data in UFSAR Table 8.3-1.

RAI QUESTION 7:

The assumption of a 0.2 starting power factor for small motors may not be conservative, especially when cable impedance is included.

RESPONSE:

The assumed starting power factor of 0.2 for the equivalent MCC motor loads could be non-conservative for the diesel generator power profile, especially when cable impedance is included, because starting power factors of some motors could be greater than 0.2 and the resistance of the cable for a small motor is greater than the reactance. However, the equivalent MCC motor loads used in this calculation are still very conservative, as shown below:

MCC	Motor load	Allowance for future addition (15 HP)	Motor load used in calculation (motor load + allowance)
2BRA (Sheet 236 of CCN 9)	1.44 KW + j1.91 KVAR	13.01 KW +j 8.06 KVAR	14.45 KW +j 9.97 KVAR
2BD (Sheet 237 of CCN 9)	5.28 KW + j5.54 KVAR	13.01 KW + j8.06 KVAR	18.29 KW + j13.60 KVAR
2BE (Sheet 238 of CCN 9)	32.02 KW + j42.70 KVAR	13.01 KW + j8.06 KVAR	45.03 KW + j50.76 KVAR
2BY (Sheet 239 of CCN 9)	73.14 KW + j47.36 KVAR	13.01 KW + j8.06 KVAR	86.15 KW + j55.42 KVAR
Total	111.88 KW + j97.51 KVAR	52.04 KW + j32.24 KVAR	163.92 KW + j129.75 KVAR

Note that the assumed starting power factor of 0.2 for the equivalent MCC motor load does not impact the diesel generator voltage profile because the voltage profile is determined by KVA load and the starting power factor does not change the KVA value of motor load.

RAI QUESTION 8:

Provide coordination curves to illustrate that two loads starting simultaneously have proper breaker coordination with upstream main breakers (one example is sufficient).

RESPONSE:

An example curve is provided in Enclosure 3.

Breaker selected for coordination curve:	**2A0417 which feeds the maximum accident loads of bus 3A04**
Reason why breaker 2A0417 is selected:	**Lowest overcurrent relay setting (2400 A)**
Sequence step selected:	**32.5 seconds of CASE IV.BX (refer to sheet 161 of CCN 9)**
Reason why the sequence was selected:	**Two motors (E336 & 3P141) are starting with heaviest bus load**
Maximum accident load of bus 3A04:	**804.9 A (Case study A1 of calculation E4C-090)**

Starting motors (E4C-087 & CCN 9 to E4C-082):

E336:	**FLA - 72 A, LRA - 382 A, starting time - 0.5 second**
3P141:	**FLA - 99 A, LRA - 693 A, starting time - 3.3 seconds**
Overcurrent relay setting (E4C-098):	**151 relay - CO-8, relay tap - 10 A, relay time dial - 2 seconds @ 29 A, CT - 1200/5**

As shown in Enclosure 3, the 151 relay will not initiate tripping of the bus tie breaker during multiple motor starting.

ENCLOSURE 1, QUESTION 1:

There appears to be a mismatch between recorded test data and calculated voltage during starting conditions.

RESPONSE:

As described in the SCE response to NRC questions, Reference 3, PSS/E Program verification is accomplished by simulating a portion of the pre-operational Transformer Voltage Tap Verification test for SONGS Unit 2, and comparing the results of the test with the results of the PSS/E Program simulations. During this test, the dynamic and steady state voltages at the ESF 4.16 KV buses were monitored by a recorder when the Engineered Safety Features (ESF) loads on both Trains were simultaneously

sequenced to the offsite power supply, with the switchyard voltage at 218.5 KV (95% of nominal 230 KV). The transformer tap verification test conditions are simulated in the PSS/E program using the existing electrical parameters. The voltage profiles resulting from the dynamic simulations are then compared with the voltage profiles from the actual test. The resulting plots from the dynamic simulations and actual test are then superimposed for comparison (Figures 1 & 2 of Reference 3).

As shown in the Figures 1 & 2, the PSS/E Program dynamic simulation voltage profiles closely match the actual test voltage profiles. Voltage from the dynamic simulations are generally conservative (i.e., lower than the corresponding test values). The simulated voltage at t=0 is the switchyard voltage of 218.5 KV used for the transformer tap verification tests. The calculated voltages for buses 2A04 and 2A06 at t=0 are the results of the dynamic simulation, using the switchyard voltage of 218.5 KV. Therefore, the calculated voltages for buses 2A04 and 2A06 at t=0 are different from the recorded test data. However, the voltages from the dynamic simulation are within 3% of the test voltages, which meets the requirements of Branch Technical Position PSB-1 section 4.

ENCLOSURE 1, QUESTION 3:

The table in Reference 3 gives starting times, but no corresponding voltage and frequency.

RESPONSE:

The corresponding voltages for the calculated motor starting times are tabulated below:

Service	Pump ID	Calculated motor starting time (sec)	Voltage (per unit)	Reference
LPSI pump	2P015 2P016	0.87	Approx. 0.925 to 1.15	Sheet 28 of CCN 9 to E4C-082
Containment Spray pump	2P012 2P013	0.87	Approx. 0.83 to 1.23	Sheet 32 of CCN 9 to E4C-082
Component Cooling Water pump	2P025	0.73	Approx. 0.825 to 1.23	Sheet 33 of CCN 9 to E4C-082
Auxiliary Feedwater pump	2P141 2P504	3.3	Approx. 0.805 to 1.17	Sheet 39 of CCN 9 to E4C-082

ADDITIONAL QUESTION 1:

Figure 2 of Reference 1 provided a clear graphical demonstration for the containment spray pump start time as to the effects of the broadened acceptance criteria, and why this was permissible. Provide similar analyses for all load groups.

RESPONSE:

As shown in table below, the broadened timer tolerances are permissible for all applications with respect to the Licensee Controlled Specification (LCS) limits.

Total response time with calculated acceleration times

Service	ESF logic response time(sec)	DG breaker LOVS reset (sec)	Timer setpoint (sec)	timer tolerance (sec)	Breaker closure time (sec)	Calculated acceleration time (sec)	Total response time (sec)	LCS Limit (sec)
LPSI P015/P016	1.0	10	5	-0.5 +2.5	0.4	0.87	19.77	41
CS PUMP P012/P013	1.0	10	10	±2.5	0.4	0.87	24.77	25.4
CCW Pums P024/P025/P026	1.0	10	15	±2.5	0.4	0.73	29.63	31
Cont Emerg. Cool. Units E399/E400/E401/E402	-	-	33.5 (Note 1)	-0.5* +2.5*	0.8 (Note 2)	3.20	40	46.8
AFW Pumps P141/P504	1.0	10	30	±3.0	0.4	3.3	37.7	52.7

Total response time with assumed acceleration times

Service	ESF logic response time(sec)	DG breaker LOVS reset (sec)	Timer setpoint (sec)	timer tolerance (sec)	Breaker closure time (sec) (Note 3)	Assumed acceleration time (sec) (Note 3)	Total response time (sec)	LCS Limit (sec)
LPSI P015/P016	1.0	10	5	-0.5 +2.5	-	22.5	41	41
CS PUMP P012/P013	1.0	10	10	±2.5	-	1.9	25.4	25.4
CCW Pums P024/P025/P026	1.0	10	15	±2.5	-	2.5	31	31
Cont Emerg. Cool. Units E399/E400/E401/E402	-	-	33.5 (Note 1)	-0.5* +2.5*	-	10	46	46.8
AFW Pumps P141/P504	1.0	10	30	±3.0	-	8	52	52.7

Notes:
1. CCW pump breaker closure time plus 5 seconds.
2. CCW breaker closure time and ECU breaker closure time.
3. Assumed acceleration time includes an assumed breaker closing time of 0.4 second

ADDITIONAL QUESTION 2:

Clarify the statement on page 4 of Reference 2 of Reference 1: "The AFW pump is not specifically addressed in the safety analyses."

RESPONSE:

Reference 2 of Reference 1 is a letter from S. D. Root (SCE) to A. J. Thiel (SCE) dated March 24, 1995, Subject: Review of ESF Integrated Load Sequence Testing Design Response Time Requirements - Unit 2 Cycle 8 San Onofre Nuclear Generating Station, Units 2 & 3. Page 4 of the reference includes the statements, "The AFW pump is not specifically addressed in the safety analyses. Only an overall response time is assumed. The overall time is limited to 52.7 seconds per Reference F, ..." These statements are clarified as follows:

The context of the discussion is ESF pumps for which the response assumed in the safety analyses would be affected by a 10% delay in pump sequencing. The Reference 2 statement means that the response time of 52.7 seconds used in reload analysis ground rules is for the overall auxiliary feed water (AFW) system, including pumps and valves (the valve response time is normally limiting for the AFW system). This overall time limit appears in LCS Table 3.3.100-2, item 9.

ADDITIONAL QUESTION 3:

Please verify that response times are still applicable, since they are no longer listed in the Technical Specifications.

RESPONSE:

Response times which were formerly listed in the Technical Specification have been relocated to the Licensee Controlled Specifications (LCS), and are still applicable. Engineered Safety Features Actuation System Response Times are listed in LCS Table 3.3.100-2 (pages 3.3.100-3 through 3.3.100-6).

ENCLOSURE 2

UFSAR TABLE 8.3-1
REVISION 15

Table 8.3-1
List of Loads Supplied by Class 1E AC System (Sheet 1 of 9)

SONGS UNIT 2 LOAD GROUP A (Applicable to Unit 3)

TAG NO.	EQUIPMENT DESCRIPTION	RATED HP [KVA]	BHP [KW]	STARTING SEQ.	STARTING TIME(secs) (4)	STARTING MANUAL (M) AUTO (A)	OPERATING TIME	LOSS OF COOLANT ACCIDENT (LOCA) INJECTION PHASE KW	INJECTION PHASE KVAR	RECIRC. PHASE KW	RECIRC. PHASE KVAR	MAIN STEAM LINE BREAK (MSLB) KW	MSLB KVAR	SHUTDOWN HOT SHUTDOWN KW	HOT SHUTDOWN KVAR	COLD SHUTDOWN KW	COLD SHUTDOWN KVAR
	4.16KV SWITCHGEAR BUS 2A04.																
P012	CONTAINMENT SPRAY PUMP (11)	500	393	3	10	A	C	315.2	161.5	315.2	161.5	315.2	161.5	NR	NR	353	180.9
P141	AUXILIARY FEEDWATER PUMP (6)	800	668	7	30	A	C	682.3	368.5	682.3	368.5	682.3	368.5	682.3	368.5	NR	NR
P024	COMPONENT COOLING WATER PUMP (1)	600	594	4	15	A	C	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
P025	COMPONENT COOLING WATER PUMP (1)	600	594	4	15	A	C	476.6	270.1	476.6	270.1	476.6	270.1	476.6	270.1	476.6	270.1
P015	LOW PRESS. SAFETY INJ. PUMP	500	485	2	5	A	C	389.1	199.4	NR	NR	389.1	199.4	NR	NR	389.1	199.4
P017	HIGH PRESS. SAFETY INJ. PUMP (1) (15)	600	505	1	0	A	C	405.1	172.6	405.1	172.6	405.1	172.6	NR	NR	NR	NR
P018	HIGH PRESS. SAFETY INJ. PUMP (1) (15)	600	505	1	0	A	C	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
P112	SALT WATER COOLING PUMP (5)	400	413	5	20	A	C	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
P307	SALT WATER COOLING PUMP (5)	400	413	5	20	A	C	331.3	214	331.3	214	331.3	214	331.3	214	331.3	214
E336	AUX. BLDG. EMERG. CHILLER (10)	581	582	8	35	A	C	462.1	261.9	462.1	261.9	462.1	261.9	462.1	261.9	462.1	261.9
T014	NON-1E UPS TRANSFORMER (7) (9) (12)	[500]	---	—	---	M	C	NR	NR	NR	NR	NR	NR	142.5	90.8	142.5	90.8
	480V SWITCHGEAR BUS 2B04																
BHP04	PRESSURIZER HEATER PANEL (7) (12)	---	[200]	---	—	M	C	NR	NR	NR	NR	NR	NR	204.8	2.8	204.8	2.8
P191	CHARGING PUMP (2)	100	70	1	0	A	C	57.3	35.5	57.3	35.5	57.3	35.5	57.3	35.5	57.3	35.5
E145	HYDROGEN RECOMBINER	[75]	—	---	—	M	C	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
A071	UPPER DOME AIR CIRCULATOR	60	68	2	5	A	C	56.4	37.5	56.4	37.5	56.4	37.5	56.4	37.5	56.4	37.5
E399	CONTAINMENT EMERGENCY COOLING UNIT	100	74	(14)	(14)	A	C	61.3	41.1	61.3	41.1	61.3	41.1	61.3	41.1	61.3	41.1
E401	CONTAINMENT EMERGENCY COOLING UNIT	100	74	(14)	(14)	A	C	61.5	41.2	61.5	41.2	61.5	41.2	61.5	41.2	61.5	41.2
P190	CHARGING PUMP	100	70	1	0	A	C	57.2	35.4	57.2	35.4	57.2	35.4	57.2	35.4	57.2	35.4
E418	CONTROL RM. EMERG. A/C UNIT	150	150	2	5	A	C	121.4	78.1	121.4	78.1	121.4	78.1	121.4	78.1	121.4	78.1
A074	STANDBY UPPER DOME AIR CIRCULATOR	60	68	2	5	A	C	56.7	37.6	56.7	37.6	56.7	37.6	56.7	37.6	56.7	37.6
	TOTAL THIS PAGE							3533.5	1954.4	3144.4	1755.0	3533.5	1954.4	2771.4	1514.5	2831.2	1526.3

Table 8.3-1
List of Loads Supplied by Class 1E AC System (Sheet 2 of 9)

SONGS UNIT 2 LOAD GROUP A (Applicable to Unit 3)

TAG NO.	EQUIPMENT DESCRIPTION	RATED HP (KVA)	BHP (KW)	STARTING SEQ.	STARTING TIME(secs) (4)	STARTING MANUAL (M) AUTO (A)	OPERATING TIME	LOSS OF COOLANT ACCIDENT (LOCA) INJECTION PHASE KW	KVAR	RECIRC. PHASE KW	KVAR	MAIN STEAM LINE BREAK (MSLB) KW	KVAR	SHUTDOWN HOT SHUTDOWN KW	KVAR	COLD SHUTDOWN KW	KVAR
	480V MCC BUS 2BD							MCC LUMPED LOADS (SEE NOTE 13)									
E654	DIESEL GENERATOR IMMERSION HEATER (7)	—	[15]	1	0	A	C										
E655	DIESEL GENERATOR IMMERSION HEATER (7)	—	[15]	1	0	A	C										
EG002	DIESEL GENERATOR SPACE HEATER (7)	—	[1.5]	1	0	A	C										
P996/P1015	DIESEL GEN. LUB. OIL CIRC. PMP/TURBOCHGR PMP	2	2	1	0	A	C										
P997/P1014	DIESEL GEN. LUB. OIL CIRC. PMP/TURBOCHGR PMP	2	2	1	0	A	C										
A274	DIESEL BLDG. EMERG. SUPPLY FAN	50	55	4	15	A	C										
A275	DIESEL BLDG. EMERG. SUPPLY FAN	50	55	4	15	A	C	MOTOR P(KW)= 161.2			Q(KVAR)= 108.3						
BD18	MOTOR SPACE HEATERS	—	[2.04]	1	0	A	C	STATIC P(KW)= 2.5			Q(KVAR)= 1.6						
E550	DIESEL RADIATOR FAN	50	39.7	3	10	A	C										
E546	DIESEL RADIATOR FAN	50	39.7	3	10	A	C										
P093	DIESEL FUEL TRANSFER PUMP	1	0.75	—	—	M	C										
P096	DIESEL FUEL TRANSFER PUMP	1	0.75	1	0	A	C										
T020	STRIP HEATER TRANSFORMERS	[15]	—	1	0	A	C										
	480V MCC BUS 2BRA																
A GROUP	MOTOR OPERATED VALVES	5.02	—	—	—	—	1	MOTOR P(KW)=			Q(KVAR)=						
T074	STRIP HEATER XFMR T074	[15]	—	1	0	A	C	STATIC P(KW)= 1.7			Q(KVAR = 1.1						
	480V MCC BUS 2BE																
RT7822	F.H. AREA VENT AIRBORNE MONITOR	[2]	—	1	0	A	C										
E464	F.H. BLDG. EMERG. ELECT. HEATER	—	[28.7]	1	0	A	C										
B003	BATTERY CHARGER D3	[74.8]	—	1	0	A	C										
RT7804	CONTAINMENT AIRBORNE MONITOR	[2]	—	1	0	A	C	MOTOR P(KW)=			Q(KVAR)=						
L266	BORIC ACID MKUP HT. TRACING PNL.	[18]	—	1	0	A	C	STATIC P(KW)= 88.4			Q(KVAR)= 37.7						
E652	POST ACCID. CLEAN-UP UNIT HEATER	—	[3.6]	1	0	A	C										
T063	VITAL BUS POWER SUPPLY BACKUP PNL	[25]	—	—	—	M	C										
A GROUP	MOTOR OPERATED VALVES	49.04	—	—	—	—	1										
	TOTAL THIS PAGE							253.8	148.7	253.8	148.7	253.8	148.7	253.8	148.7	253.8	148.7

Table 8.3-1
List of Loads Supplied by Class 1E AC System (Sheet 3 of 9)

SONGS UNIT 2 LOAD GROUP A (Applicable to Unit 3)

TAG NO.	EQUIPMENT DESCRIPTION	RATED HP (KVA)	BHP (KW)	STARTING SEQ.	STARTING TIME(secs) (4)	STARTING MANUAL (M) AUTO (A)	OPERATING TIME	LOSS OF COOLANT ACCIDENT (LOCA) INJECTION PHASE KW	INJECTION PHASE KVAR	RECIRC. PHASE KW	RECIRC. PHASE KVAR	MAIN STEAM LINE BREAK (MSLB) KW	MAIN STEAM LINE BREAK (MSLB) KVAR	SHUTDOWN HOT SHUTDOWN KW	HOT SHUTDOWN KVAR	COLD SHUTDOWN KW	COLD SHUTDOWN KVAR
	480V MCC BUS 2BY							MCC LUMPED LOADS (SEE NOTE 13)									
B001	BATTERY CHARGER D1 (125V)	[74.8]	—	1	0	A	C										
A370	INTAKE STRUCTURE COOLING FAN	5	3.5	1	0	A	C										
A373	INTAKE STRUCTURE COOLING FAN	5	3.5	1	0	A	C										
E439	BA MAKEUP PUMP AREA EMERGENCY A/C	1	1	1	0	A	C										
E440	BA MAKEUP PUMP AREA EMERGENCY A/C	1	1	1	0	A	C										
P174	BORIC ACID MAKEUP PUMP T071	25	24	1	0	A	C										
P175	BORIC ACID MAKEUP PUMP T072	25	24	1	0	A	C										
LP35	ESSENTIAL LIGHTING PANEL (7) (6)	[7.5]	—	—	—	M	C										
E437	CHARGING PUMP AREA EMERG. A/C	1	0.5	1	0	A	C										
E438	CHARGING PUMP AREA EMERG. A/C	1	1	1	0	A	C										
E424	CONTROL RM. CAB. EMERGENCY A/C	7.5	7.5	1	0	A	C										
T411	EPFM PANEL 2L411 (7)	[0.5]	—	—	—	M	C	MOTOR P(KW)= 140.1				Q(KVAR)= 86.8					
E417	SFT. EQUIP. BLDG. PMP. RM. EMERG. A/C U.	7.5	6	1	0	A	C	STATIC P(KW)= 70.7				Q(KVAR)= 47.5					
E517	SFT. EQUIP. BLDG. PMP. RM. EMERG. A/C U.	1.5	0.9	1	0	A	C										
E453	CCW BLDG. PUMP RM. EMERG. A/C	1	0.7	1	0	A	C										
E454	CCW BLDG. PUMP RM. EMERG. A/C	1	0.76	1	0	A	C										
T110	TECHNICAL SUPPORT CENTER XFMR (7)	[25]	—	1	0	A	C										
P009	SPENT FUEL POOL PUMP	30	26	1	0	A	C										
A394	FEED WATER PUMP ROOM FAN	7.25	5	1	0	A	C										
E441	F. H. BLDG. PUMP ROOM EMERGENCY A/C	1	0.8	1	0	A	C										
P101B	CCW SEISMIC MAKE-UP PUMP P101B	7.5	7.5	1	0	A	C										
E370	F. H. BLDG. ACCIDENT A/C UNIT	50	50	1	0	A	C										
T039	STRIP HEATER TRANSFORMERS (2X039)	[30]	—	1	0	A	C										
A GROUP	MOTOR OPERATED VALVES	12.4	—	—	—	—	I										
A GROUP	MOTOR SPACE HEATERS	—	[7.93]	1	0	A	C										
A GROUP	MOTOR SPACE HEATERS	—	[3.00]	1	0	A	C										
	TOTAL THIS PAGE							210.8	134.3	210.8	134.3	210.8	134.3	210.8	134.3	210.8	134.3

Table 8.3-1
List of Loads Supplied by Class 1E AC System (Sheet 4 of 9)

SONGS UNIT 2 LOAD GROUP A (Applicable to Unit 3)

TAG NO.	EQUIPMENT DESCRIPTION	RATED HP (KVA)	BHP (KW)	STARTING SEQ.	STARTING TIME(secs) (4)	STARTING MANUAL (M) AUTO (A)	OPERATING TIME	LOSS OF COOLANT ACCIDENT (LOCA) INJECTION PHASE KW	LOCA INJECTION PHASE KVAR	LOCA RECIRC. PHASE KW	LOCA RECIRC. PHASE KVAR	MAIN STEAM LINE BREAK (MSLB) KW	MSLB KVAR	SHUTDOWN HOT SHUTDOWN KW	HOT SHUTDOWN KVAR	SHUTDOWN COLD SHUTDOWN KW	COLD SHUTDOWN KVAR
	480V MCC BUS BQ (3)							MCC LUMPED LOADS (SEE NOTE 13)									
RT7824	CONTROL RM. AIRBORNE MONITOR	[2]	---	---	---	M	C										
E297	CONTROL BLDG. EMERG. VENT UNIT	---	[4.6]	1	0	A	C										
2L270	CNTNMT.SPRAY CHEM. STRG. HT. TRACING PNL.	[6]	---	1	0	A	C										
3L270	CNTNMT.SPRAY CHEM. STRG. HT. TRACING PNL.	[6]	---	1	0	A	C										
A173	CNTRL.BLDG.BATT.RM.EMERG.EXHAUST FAN U2	5	2.8	1	0	A	C										
E255	CNTRL.BLDG.ESF SWGR.RM.EMERG. A/C UNIT 2	10	8.75	1	0	A	C										
A207	CTRL.BLDG.CTRL.RM.EMERG.AIR SPLY.FAN U2/3	10	5.75	1	0	A	C										
2/3L437	HEALTH PHYSICS COMPUTER UPS (7)	---	[6.6]	1	0	A	C	MOTOR P(KW)= 57.3				Q(KVAR)= 37					
2/3L211-1	EMERGENCY SIREN CONTROL PANEL	[19.1]	---	---	---	M	C	STATIC P(KW)= 81.9				Q(KVAR)= 48.6					
A173	BATT.RM.EMERG.EXHAUST FAN UNIT 3	5	2.8	1	0	A	C										
E255	ESF SWGR.RM.EMERG. A/C UNIT 3	10	8.75	1	0	A	C										
P445	OIL PUMP FOR CHILLER E336	1.5	1.5	1	0	A	C										
A053	CONTROL BLDG. CHILLER ROOM SUPPLY FAN	5	3	1	0	A	C										
A056	CONTROL BLDG. CHILLER ROOM EXHAUST FAN	2	1	1	0	A	C										
P162	CONTROL BLDG.EMERG.CHILLER WATER PUMP	40	30	1	0	A	C										
W310	PUMPOUT UNIT CHILLER E336	2	2	1	0	A	C										
T033	STRIP HEATER TRANSFOMER	[15]	---	1	0	A	C										
2/3L211-4	EMERGENCY SIREN CONTROL PANEL	[19.1]	---	---	---	M	C										
	TOTAL THIS PAGE							139.2	85.6	139.2	85.6	139.2	85.6	139.2	85.6	139.2	85.6
	TOTAL LOAD							4197.3	2323	3749.2	2123.6	4197.3	2323	3375.2	1883.1	3435	1894.9
	CABLE & TRANSFORMER LOSSES							55.7	187.6	55.7	187.6	55.7	187.6	55.7	187.6	55.7	187.6
	OVERALL TOTAL							4193	2510.6	3803.9	2311.1	4193	2510.6	3430.9	2070.6	3490.7	2082.4

Table 8.3-1
List of Loads Supplied by Class 1E AC System (Sheet 5 of 9)

SONGS UNIT 2 LOAD GROUP B (Applicable to Unit 3)

TAG NO.	EQUIPMENT DESCRIPTION	RATED HP [KVA]	BHP [KW]	STARTING SEQ.	STARTING TIME(secs) (4)	STARTING MANUAL (M) AUTO (A)	OPERATING TIME	LOSS OF COOLANT ACCIDENT (LOCA) INJECTION PHASE KW	INJECTION PHASE KVAR	CIRC. PHASE KW	CIRC. PHASE KVAR	MAIN STEAM LINE BREAK (MSLB) KW	MSLB KVAR	SHUTDOWN HOT SHUTDOWN KW	HOT SHUTDOWN KVAR	COLD SHUTDOWN KW	COLD SHUTDOWN KVAR
	4.16KV SWITCHGEAR BUS 2A06																
P013	CONTAINMENT SPRAY PUMP (11)	500	393	3	10	A	C	315.2	161.5	315.2	161.5	315.2	161.5	NR	NR	353.0	180.9
P504	AUXILIARY FEEDWATER PUMP (6)	800	858	7	30	A	C	682.2	368.5	682.2	368.5	682.2	368.5	682.2	368.5	NR	NR
P026	COMPONENT COOLING WATER PUMP (1)	600	594	4	15	A	C	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
P025	COMPONENT COOLING WATER PUMP (1)	600	594	4	15	A	C	476.6	270.1	476.6	270.1	476.6	270.1	476.6	270.1	476.6	270.1
P016	LOW PRESS. SAFETY INJ. PUMP	500	485	2	5	A	C	389.1	199.4	NR	NR	389.1	199.4	NR	NR	389.1	199.4
P019	HIGH PRESS. SAFETY INJ. PUMP (1) (15)	600	505	1	0	A	C	405.1	172.6	405.1	172.6	405.1	172.6	NR	NR	NR	NR
P018	HIGH PRESS. SAFETY INJ. PUMP (1) (15)	600	505	1	0	A	C	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
P113	SALT WATER COOLING PUMP (5)	400	413	5	20	A	C	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
P114	SALT WATER COOLING PUMP (5)	400	413	5	20	A	C	331.3	214.0	331.3	214.0	331.3	214.0	331.3	214.0	331.3	214.0
E335	AUX. BLDG. EMERG. CHILLER (10)	581	592	8	35	A	C	462.0	261.9	462.0	261.9	462.0	261.9	462.0	261.9	462.0	261.9
	480V SWITCHGEAR BUS 2B06																
BHP08	PRESSURIZER HEATER PANEL (7) (12)	—	[200]	—	—	M	C	NR	NR	NR	NR	NR	NR	206.5	3.2	NR	NR
P192	CHARGING PUMP	100	70	1	0	A	C	57.5	35.6	57.5	35.6	57.5	35.6	57.5	35.6	57.5	35.6
E146	HYDROGEN RECOMBINER	[75]	—	—	—	M	C	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
A072	UPPER DOME AIR CIRCULATOR	60	68	2	5	A	C	56.5	37.7	56.5	37.7	56.5	37.7	56.5	37.7	56.5	37.7
E400	CONTAINMENT EMERGENCY COOLING UNIT	100	74	(14)	(14)	A	C	61.6	41.3	61.6	41.3	61.6	41.3	61.6	41.3	61.6	41.3
E402	CONTAINMENT EMERGENCY COOLING UNIT	100	74	(14)	(14)	A	C	62	41.5	62	41.5	62	41.5	62	41.5	62	41.5
E419	CONTROL RM. EMERG. A/C UNIT	150	150	2	5	A	C	116.5	76.5	116.5	76.5	116.5	76.5	116.5	76.5	116.5	76.5
P191	CHARGING PUMP (2)	100	70	1	0	A	C	57.5	35.6	57.5	35.6	57.5	35.6	57.5	35.6	57.5	35.6
A073	STANDBY UPPER DOME AIR CIRCULATOR	60	68	2	5	A	C	56.9	37.7	56.9	37.7	56.9	37.7	56.9	37.7	56.9	37.7
	TOTAL THIS PAGE							3532.0	1953.9	3142.9	1754.5	3532.0	1953.9	2626.1	1423.6	2482.5	1432.2

Table 8.3-1
List of Loads Supplied by Class 1E AC System (Sheet 6 of 9)

SONGS UNIT 2 LOAD GROUP B (Applicable to Unit 3)

TAG NO.	EQUIPMENT DESCRIPTION	RATED HP [KVA]	BHP [KW]	STARTING SEQ.	STARTING TIME(secs) (4)	STARTING MANUAL (M) AUTO (A)	OPERATING TIME	LOSS OF COOLANT ACCIDENT (LOCA) INJECTION PHASE KW	KVAR	CIRC. PHASE KW	KVAR	MAIN STEAM LINE BREAK (MSLB) KW	KVAR	SHUTDOWN HOT SHUTDOWN KW	KVAR	COLD SHUTDOWN KW	KVAR
	480V MCC BUS 2BH																
E658	DIESEL GENERATOR IMMERSION HEATER (7)	---	[15]	1	0	A	C										
E657	DIESEL GENERATOR IMMERSION HEATER (7)	---	[15]	1	0	A	C										
EG003	DIESEL GENERATOR SPACE HEATER (7)	---	[1.5]	1	0	A	C										
P998/P1017	DIESEL GEN. LUB. OIL CIRC. PMP/ TURBOCHGR PMP	2	2	1	0	A	C										
P999/P1016	DIESEL GEN. LUB. OIL CIRC. PMP/ TURBOCHGR PMP	2	2	1	0	A	C										
A276	DIESEL BLDG. EMERG. SUPPLY FAN	50	55	4	15	A	C	MOTOR	P(KW)=	161.2		Q(KVAR)=	108.3				
A277	DIESEL BLDG. EMERG. SUPPLY FAN	50	55	4	15	A	C	STATIC	P(KW)=	4.2		Q(KVAR)=	2.6				
BH03	MOTOR SPACE HEATERS	---	[2.04]	1	0	A	C										
E549	DIESEL RADIATOR FAN	50	39.7	3	10	A	C										
E547	DIESEL RADIATOR FAN	50	39.7	3	10	A	C										
P094	DIESEL FUEL TRANSFER PUMP	1	0.75	---	---	M	C										
P095	DIESEL FUEL TRANSFER PUMP	1	0.75	1	0	A	C										
T023	STRIP HEATER TRANSFORMERS	[15]	---	1	0	A	C										
	480V MCC BUS 2BRB																
B GROUP	MOTOR OPERATED VALVES	2.45	---	---	---	---	I	MOTOR	P(KW)=	13.0		Q(KVAR)=	8.1				
T075	STRIP HEATER TRANSFORMER	[15]	---	1	0	A	C	STATIC	P(KW)=	8.5		Q(KVAR)=	5.3				
	480V MCC BUS 2BJ																
RT7823	F.H. AREA VENT AIRBORNE MONITOR	[2]	---	1	0	A	C										
E485	F.H. BLDG. EMERG. ELECT. HEATER	---	[32.3]	1	0	A	C										
B004	BATTERY CHARGER D4 (125V)	[74.6]	---	1	0	A	C	MOTOR	P(KW)=	13.0		Q(KVAR)=	8.1				
RT7807	CONTAINMENT AIRBORNE MONITOR	[2]	---	1	0	A	C	STATIC	P(KW)=	82.3		Q(KVAR)=	32.6				
L287	BORIC ACID MKUP HT. TRACING PNL.	[6]	---	1	---	A	C										
T062	VITAL BUS POWER SUPPLY BACKUP PNL.	[25]	---	---	---	M	C										
B GROUP	MOTOR OPERATED VALVES	46.51	---	---	---	---	I										
	TOTAL THIS PAGE							282.2	164.9	282.2	164.9	282.2	164.9	282.2	164.9	282.2	164.9

Table 8.3-1
List of Loads Supplied by Class 1E AC System (Sheet 7 of 9)

SONGS UNIT 2 LOAD GROUP B (Applicable to Unit 3)

TAG NO.	EQUIPMENT DESCRIPTION	RATED HP (KVA)	BHP (KW)	STARTING SEQ.	STARTING TIME(secs) (4)	STARTING MANUAL (M) AUTO (A)	OPERATING TIME	LOSS OF COOLANT ACCIDENT (LOCA) INJECTION PHASE KW	INJECTION PHASE KVAR	CIRC. PHASE KW	CIRC. PHASE KVAR	MAIN STEAM LINE BREAK (MSLB) KW	MAIN STEAM LINE BREAK KVAR	SHUTDOWN HOT SHUTDOWN KW	HOT SHUTDOWN KVAR	COLD SHUTDOWN KW	COLD SHUTDOWN KVAR
	480V MCC BUS 2BZ							MCC LUMPED LOADS (SEE NOTE 13)									
B002	BATTERY CHARGER D2 (125V)	[74.8]	—	1	0	A	C										
2L271	CTMNT.SPRAY.CHEM.STOR.HT.TRACING PNL.	[6]	—	1	0	A	C										
A371	INTAKE STRUCTURE COOLING FAN	5	3.6	1	0	A	C										
A372	INTAKE STRUCTURE COOLING FAN	5	3.5	1	0	A	C										
P145	EMERGENCY SPRAY WATER PUMP (7)	35	35	1	0	A	C										
LP35	ESSENTIAL LIGHTING PANEL (7) (8)	[7.5]	—	—	—	M	C										
A443	FEED WATER PUMP ROOM FAN.	7.25	5	1	0	A	C										
E435	CHARGING PUMP AREA EMERG. A/C.	1	0.5	1	0	A	C										
E436	CHARGING PUMP AREA EMERG. A/C.	1	1	1	0	A	C										
E423	CONTROL RM. CAB. EMERGENCY A/C.	7.5	7.5	1	0	A	C	MOTOR P(KW)= 139.2			Q(KVAR)= 86.2						
E416	SFT.EQUIP.BLDG.PMP.RM.EMERG.	5	6	1	0	A	C	STATIC P(KW)= 68.9			Q(KVAR)= 40.9						
E445	SFT.EQUIP.BLDG.PMP.RM.EMERG.	1.5	0.9	1	0	A	C										
E455	CCW.BLDG.PUMP RM.EMERG.A/C.	1	0.78	1	0	A	C										
E518	SFT.EQUIP.BLDG.PMP.RM.EMERG.	1	0.9	1	0	A	C										
P010	SPENT FUEL POOL PUMP.	30	26	1	0	A	C										
E442	F.H. BLDG.PUMP RM. EMERG. A/C.	1	0.8	1	0	A	C										
P1019	CCW SEISMIC MAKE-UP PUMP	7.5	7.5	1	0	A	C										
E971	F.H. BLDG. ACCIDENT A/C UNIT.	50	50	1	0	A	C										
T041	STRIP HEATER TRANSFORMERS.	[30]	—	1	0	A	C										
B GROUP	MOTOR OPERATED VALVES.	17.73	—	—	—	—	I										
B GROUP	MOTOR SPACE HEATER.	—	[7.93]	1	0	A	C										
B GROUP	MOTOR SPACE HEATER.	—	[2.76]	1	0	A	C										
TOTAL THIS PAGE								208.1	127.1	208.1	127.1	208.1	127.1	208.1	127.1	208.1	127.1

Table 8.3-1
List of Loads Supplied by Class 1E AC System (Sheet 8 of 9)

SONGS UNIT 2 LOAD GROUP B (Applicable to Unit 3)

TAG NO.	EQUIPMENT DESCRIPTION	RATED HP [KVA]	BHP [KW]	STARTING SEQ.	STARTING TIME(secs) (4)	STARTING MANUAL (M) AUTO (A)	OPERATING TIME	LOSS OF COOLANT ACCIDENT (LOCA) INJECTION PHASE KW	INJECTION PHASE KVAR	CIRC. PHASE KW	CIRC. PHASE KVAR	MAIN STEAM LINE BREAK (MSLB) KW	MAIN STEAM LINE BREAK KVAR	SHUTDOWN HOT SHUTDOWN KW	HOT SHUTDOWN KVAR	COLD SHUTDOWN KW	COLD SHUTDOWN KVAR
	480V MCC BUS BS (3)							MCC LUMPED LOADS (SEE NOTE 13)									
RT7825	CONTROL ROOM AIRBORNE MONITOR.	[2]	---	---	---	M	C										
E296	CTRL.BLDG.EMERG.VENT UNIT ELECT. HEATER.	---	[4.8]	1	0	A	C										
A174	CNTRL.BLDG.BATT.RM.EMERG.EXHAUST FAN UNIT 2	5	2.8	1	0	A	C										
E257	CNTRL.BLDG.ESF SWGR.RM.EMERG. A/C UNIT 2	10	8.75	1	0	A	C										
A206	CTRL.BLDG.CTRL.RM.EMERG.AIR SUPPLY FAN.	10	5.75	1	0	A	C										
2L414	FIRE DETECTION AND ACTUATION SYSTEM. (7)	[15]	---	1	0	A	C										
3L414	FIRE DETECTION AND ACTUATION SYSTEM. (7)	[15]	---	1	0	A	C										
A174	BATT.RM.EMERG.EXHAUST FAN UNIT 3	5	2.8	1	0	A	C	MOTOR P(KW)= 70.3			Q(KVAR)= 45.4						
E257	ESF SWGR.RM.EMERG. A/C UNIT 3	10	6.75	1	0	A	C	STATIC P(KW)= 42.6			Q(KVAR)= 23.0						
P444	OIL PUMP FOR CHILLER E335.	1.5	1.5	1	0	A	C										
A054	CONTROL BUILDING CHILLER ROOM SUPPLY FAN	5	3	1	0	A	C										
A055	CONTROL BUILDING CHILLER ROOM SUPPLY FAN	2	1	1	0	A	C										
P160	CTRL.BLDG.EMERG.CHILLED WATER PUMP.	40	30	1	0	A	C										
W309	PUMP OUT UNIT CHILLER E335.	2	2	1	0	A	C										
T035	STRIP HEATER TRANSFORMER.	[15]	—	1	0	A	C										
	TOTAL MCC BS							112.9	68.4	112.9	68.4	112.9	68.4	112.9	68.4	112.9	68.4
	TOTAL PREVIOUS PAGES							4135.2	2314.3	3746.1	2114.9	4135.2	2314.3	3231.3	1784.0	3085.7	1792.6
	CABLE & TRANSFORMER LOSSES							45.6	175.2	45.6	175.2	45.6	175.2	45.6	175.2	45.6	175.2
	OVERALL TOTAL							4180.8	2489.5	3791.7	2290.1	4180.8	2489.5	3276.9	1959.2	3131.3	1967.8

NOTES

1. NORMALLY, PUMPS P018 AND P025 ARE CONNECTED TO BUS 2A04 OF LOAD GROUP A. THE PUMPS HAVE CAPABILITY OF MANUAL TRANSFER TO BUS 2A06 OF LOAD GROUP B THROUGH TRANSFER SWITCH AS SHOWN IN UFSAR FIGURE 8.3-1. BECAUSE OF ITS LONGER FEEDER CABLE, SWING PUMP P025 WILL YIELD A CALCULATED LOAD VALUE HIGHER THAN UNIT 2 TRAIN A DEDICATED PUMP P024, UNIT 2 TRAIN B DEDICATED PUMP P026 OR UNIT 3 TRAIN B DEDICATED PUMP P026 AND THUS POSTULATED AS THE OPERATING PUMP. UNIT 3 TRAIN A DEDICATED PUMP P024 IS POSTULATED AS THE OPERATING PUMP SINCE ITS FEEDER CABLE IS LONGER THAN THE FEEDER CABLE OF SWING PUMP P025.

Table 8.3-1
List of Loads Supplied by Class 1E AC System (Sheet 9 of 9)

NOTES (continued)

2. NORMALLY, PUMP P191 IS CONNECTED TO BUS 2B04 OF LOAD GROUP A. THE PUMP HAS CAPABILITY OF MANUAL TRANSFER TO BUS 2B06 OF LOAD GROUP B THROUGH TRANSFER SWITCH AS SHOWN IN UFSAR FIGURE 8.3-1.

3. THESE MCCS ARE NORMALLY CONNECTED TO UNIT 2 DIESEL GENERATORS WITH THE CAPABILITY OF MANUAL TRANSFER TO UNIT 3 DIESEL GENERATORS. LOADS CONNECTED TO LOAD GROUP A OF UNIT 2 WILL BE TRANSFERRED TO LOAD GROUP A OF UNIT 3. LOADS CONNECTED TO LOAD GROUP B OF UNIT 2 WILL BE TRANSFERRED TO LOAD GROUP B OF UNIT 3.

4. THE STARTING TIME SHOWN EXCLUDES THE 10 SECONDS MAXIMUM ALLOWABLE TIME FOR THE DIESEL GENERATOR TO COME UP TO SPEED AND VOLTAGE, REENERGIZE THE BUS, AND RESET THE UNDERVOLATAGE RELAY LOGIC (LOVS, SOVS AND DGVSS) AFTER THE START SIGNAL. TIME ZERO IS WHEN THE DIESEL GENERATOR CIRCUIT BREAKER CLOSES.

   a. STARTING MODE SHOWN AS (M) INDICATES ESF LOADS THAT WILL BE APPLIED TO THE DIESEL GENERATOR BY OPERATOR ACTION AFTER THE AUTOMATIC LOADING SEQUENCE IS COMPLETED.

   b. STARTING MODE SHOWN AS (A) INDICATES ESF LOADS THAT WILL BE AUTO SEQUENCING OR MAY OTHERWISE BE ENERGIZED BY AUTOMATIC DEVICES, SUCH AS THERMOSTAT, PRESSURE SWITCHES, ETC.

   c. OPERATING TIMES SHOWN AS (C) INDICATES ESF LOADS THAT ARE REQUIRED TO OPERATE CONTINUOUSLY.

   d. OPERATING TIMES SHOWN AS (I) INDICATES INTERMITTENT OPERATION. NR INDICATES ESF LOADS THAT ARE NOT REQUIRED TO OPERATE FOR THE STATED MODE OF ACCIDENT.

5. ONLY ONE SALTWATER COOLING PUMP WILL OPERATE AT ANY TIME IN A LOAD GROUP. BECAUSE OF ITS LONGER FEEDER CABLE, P307/P114 WILL YIELD A CALCULATED LOAD VALUE HIGHER THAN ITS ASSOCIATED P112/P113 AND THUS POSTULATED AS THE OPERATING PUMP.

6. AUX FEEDWATER PUMP WILL START WITHOUT TIME DELAY ON EFAS AND PRESENCE OF BUS VOLTAGE. A SIAS (DURING OR COINCIDENT WITH EFAS) WILL TRIP THE AUX FEEDWATER PUMP AND THEN START THE PUMP AT SEQUENCE 7 AT T-30 SECONDS.

7. NON-ESF LOADS CONNECTED TO AN ESF BUS WILL BE TRIPPED BY A SIAS SIGNAL.

8. ESSENTIAL LIGHTING PANEL LP 35 IS NORMALLY POWERED BY BUS 2B2 (TRAIN B) IT CAN BE POWERED BY BUS 2B4 THROUGH A MANUAL TRANSFER SWITCH DURING CERTAIN APPENDIX R FIRES. POWER WILL ONLY BE AVAILABLE FROM THE TRAIN "A" DIESEL WITHIN 90 MINUTES OF LOSS OF TRAIN "B". THE TRAIN "A" 480V SUPPLY MUST BE ALIGNED USING TRANSFER SWITCH 2XR2LD101.

9. UNIT IS RATED AT 500KVA BUT LOADED TO 150KVA

10. FOR EFAS WITHOUT SIAS, THE AUX BLDG EMERGENCY CHILLER E330 COULD START IN SEQUENCE 7 AT T-30 SECONDS.

11. MAX BHP DURING POST ACCIDENT CONDITION IS 393HP, DURING MODES 5 & 6 OPERATION, MAX BHP IS 440 HP.

12. THE PRESSURIZER HEATERS (BACK UP) AND THE NON 1E UPS WILL BE APPLIED TO THE DIESEL GENERATOR BY OPERATOR ACTION 10 MINUTES AFTER THE DG BREAKER CLOSES.

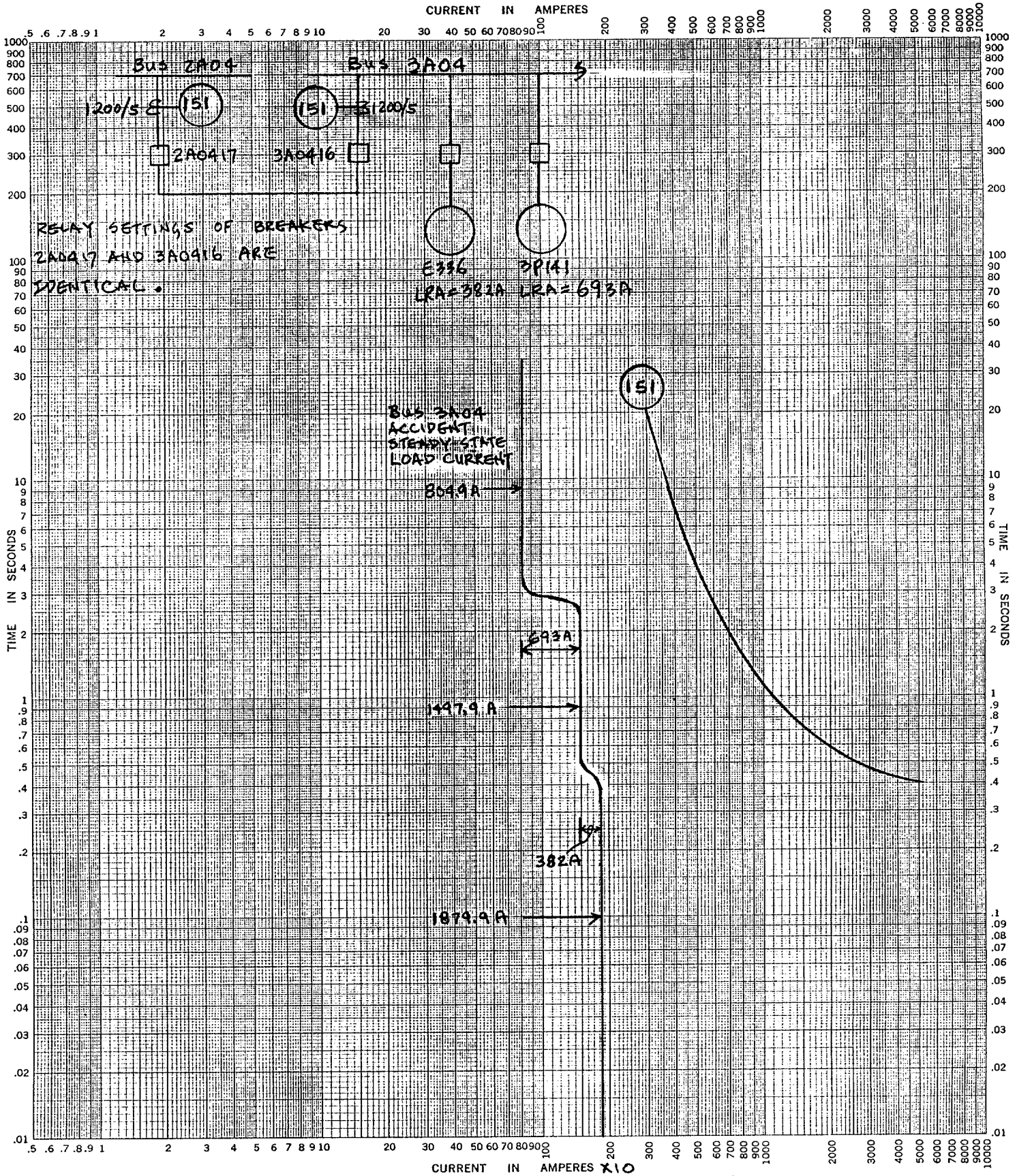
13. FOR CONSERVATISM, ALL MCC LOADS THAT MAY BE CONNECTED TO THE DIESEL DURING ACCIDENT MITIGATION AND OTHER SUBSEQUENT REQUIRED LOAD OPERATORS ARE CONSIDERED "ON" REGARDLESS OF SCENARIO.

14. THE CONTAINMENT EMERGENCY COOLING UNITS ARE STARTED APPROXIMATELY 5 SECONDS AFTER THE COMPONENT COOLING WATER PUMP (SAME TRAIN) BREAKER CLOSES.

15. TWO HPSI PUMPS (P017 & P018, OR P018 & P019) MAY BE SEQUENCED ONTO THE EDG IF A DBE OCCURS DURING PUMP OR SYSTEM TESTING.

ENCLOSURE 3

COORDINATION CURVE FOR BREAKER 2A0417



TIME-CURRENT CHARACTERISTIC CURVES

For RELAY CO-8 AND BUS 3A04 CURRENT. Fuse Links. In

BASIS FOR DATA Standards Dated

1. Tests made at Volts a-c at p-f., starting at 25C with no initial load

2. Curves are plotted to Test points so variations should be

No.

Date

K·E TIME-CURRENT CHARACTERISTIC 48 5258
KEUFFEL & ESSER CO.