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55 EAST MONROE STREET
CHICAGO, ILLINOIS 60603-5780
(312) 269-2000

Chron System
185290

S&L Letter No. Q1469E
May 4, 1992
Project No. 8913-69

Commonwealth Edison Company
Quad Cities Nuclear Station - Unit 1

Transmittal of Degraded Voltage
Calculation for Division II
W. O. No.: N/A
Mod. No.: N/A
System Code: N/A

Mr. M. L. Reed
Electrical/I&C Design Superintendent
Commonwealth Edison Company
Nuclear Engineering Department
1400 Opus Place - Suite 400
Downers Grove, Illinois 60515

Dear Mr. Reed:

Enclosed is a copy of Design Input Transmittal (DIT) QC-EXT-0077
which transmits the following Sargent & Lundy calculation:

Calculation 8913-69-19-1, Revision 0, dated May 4, 1992,
"Quad Cities 1/II Safety-Related Continuous Load
Running/Starting Voltage" (including Reference Item A).

The locations of the calculation purpose, methodology,
assumptions, and any engineering judgements are referenced in the
enclosed DIT.

Should you have any questions, please call me at (312) 269-6246.

Yours very truly,

R. M. Schiavoni
R. M. Schiavoni
Senior Electrical
Project Engineer

RMS:mco
gdgc2724.ep
In duplicate
Enclosure
Copies: (See page 2)

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CHICAGO

185290

Mr. M. L. Reed
Commonwealth Edison Company

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May 4, 1992
Page 2

Copies:

BWR Systems Design Superintendent (H. L. Massin)	(1/1/0)
CHRON System	(1/1/1)
BWR Technical Lead Engineer (M. S. Tucker)	(1/1/0)
Site Engineering Supervisor (C. A. Moerke)	(1/1/0)
Asst. Supt. of Work Planning (W. McGaffigan)	(1/1/0)
Acting BWR Systems Design Supervisor (B. M. Wong)	(1/1/0)
R. H. Jason	(1/1/0)
T. J. Ryan	(1/0/0)
E. Schumacher/File	(1/1/1)
S. Z. Haddad	(1/1/1)

SARGENT & LUNDY
ENGINEERS

EXTERNAL DESIGN INFORMATION TRANSMITTAL

X	SAFETY-RELATED	NON-SAFETY-RELATED	DIT No. - OC-EXT-0077
CLIENT <u>Commonwealth Edison Company</u> STATION <u>Quad Cities</u> UNIT(S) <u>1</u> PROJECT NO(S) <u>8913-69</u> SUBJECT <u>Transmittal of Calculation 8913-69-19-1, Revision 0, Dated 5/4/92, "Quad Cities 1/II Safety-Related Continuous Load Running/Starting Voltages."</u>			Page <u>1</u> of <u>1</u> To <u>M. L. Reed</u>

MODIFICATION OR DESIGN CHANGE NUMBER(S) N/A

<u>R. M. Schiavoni</u>	<u>EPED</u>	<u>[Signature]</u>	<u>05-04-92</u>
PREPARER (PLEASE PRINT NAME)	DIVISION	PREPARER'S SIGNATURE	ISSUE DATE

STATUS OF INFORMATION (This information is approved for use. Design information, approved for use, that contains assumptions or is preliminary or requires further verification (review) shall be so identified.)

This information is approved for use. Several assumptions used in the calculation listed below require verification.

This information is provided in accordance with the terms and conditions of the service agreement/contract between Sargent & Lundy (S&L) and its Client governing the associated services. With respect to any third party use, S&L does not assume any obligation to said third party as to the accuracy, completeness, usefulness, or non-infringing nature of such information.

IDENTIFICATION OF THE SPECIFIC DESIGN INFORMATION TRANSMITTED AND PURPOSE OF ISSUE (List any supporting documents attached to DIT by its title, revision and/or issue date, and total number of pages for each supporting document.)

This DIT transmits to Commonwealth Edison Company the following calculation (including Reference Item A.):

Calculation 8913-69-19-1, Revision 0, dated May 4, 1992, "Quad Cities 1/II Safety-Related Continuous Load Running/Starting Voltages."

The purpose, methodology, and assumptions can be found in the following calculation section and pages:

Purpose: Section III, Page 3
 Methodology: Section IX, Pages 13-15 (ELMS-AC Version 2.2 is used.)
 Assumptions and Engineering Judgements: Section VII, Pages 9-11
 References: Section V, Pages 5-7
 Comparison of Calculated Results with Acceptance Criteria: Section XI, Pages 25-26

SOURCE OF INFORMATION

Calc. No. <u>8913-69-19-1</u>	<u>0</u> <u>05-04-92</u>	Report No. <u>N/A</u>	<u>Rev. and/or date</u>
Other _____			<u>Rev. and/or date</u>

DISTRIBUTION See Letter Q1469E, Dated May 4, 1992.

135290

SARGENT & LUNDY

DESIGN INFORMATION TRANSMITTAL

☒ SAFETY-RELATED☐ NON-SAFETY-RELATED

DIT No. - QC-EPED-0489-01

CLIENT CECOPage 1 of 16STATION QUAD CITIES UNIT(S) 1/IITo W BLOETHE - 21PROJECT NO(S) 8913-69SUBJECT QUAD CITIES UNIT 1, DIV II LOAD TABLES FOR SWITCHGEAR 19 AND MCC's

MODIFICATION OR DESIGN CHANGE NUMBER(S) _____

K. YIPEPED[Signature]4-1-92

Preparer (Please print name)

Division

Preparer's signature

Issue date

STATUS OF INFORMATION (This information is approved for use. Design information, approved for use, that contains assumptions or is preliminary or requires further verification (review) shall be so identified.)

THIS INFORMATION IS APPROVED FOR USE

IDENTIFICATION OF THE SPECIFIC DESIGN INFORMATION TRANSMITTED AND PURPOSE OF ISSUE
(List any supporting documents attached to DIT by its title, revision and/or issue date, and total number of pages for each supporting document.)

ENCLOSED ARE THE LOAD TABLES SIGNED BY CECO. PLEASE USE THESE FOR YOUR BUS VOLTAGE CALC.

ALSO ENCLOSED IS M. TUCKER'S (CECO) 3-23-92 LETTER ON LOAD SHED MODIFICATIONS. PLEASE REVISE THE LOAD INPUTS FROM THE TABLES TO INCORPORATE THE UNIT 1, DIVISION II LOAD SHED MODIFICATIONS.

SOURCE OF INFORMATION

Calc. no. _____ Report no. _____

Rev. and/or date

Rev. and/or date

Other CECO CHRON 182875 (3-23-92), 182866 (3-21-92)

DISTRIBUTION

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RLB-92-073

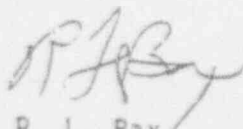
March 25, 1992

TO: M. L. Reed
E/I & C Design Superintendent

SUBJECT: QUAD CITIES REVIEW OF LOAD TABLES AND ASSUMPTIONS
(Reference CHRON #182866)

The Load Tables and Assumptions provided in CHRON #182866 have been reviewed by Quad Cities Operating and Technical Staff personnel. Minor corrections to the Load Tables are noted on the affected pages.

If you have any questions or require any additional information please contact J. Wethington at Quad Cities Station on extension 2190.



R. L. Bax
Station Manager
Quad Cities Station

RLB/JW/rjb

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PROJECT No: <u>8913-69</u>
PAGE <u>2</u> OF <u>16</u>

March 21, 1992

In Reply, Refer to

CHRON #

~~100000~~

Subject: Load Tables and Assumptions
 Degraded Voltage Analysis
 Quad Cities Station

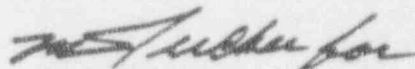
Mr. R.L. Bax

Calculations are in progress under the direction of the E/I&C group of NED for the degraded voltage analysis. A new analysis is required by the recent EDSFI NRC inspection. This analysis requires a determination of the actual worst case loading conditions of the 480 Volt Switchgear and Motor Control Centers for Quad Cities Station. To assist in this effort, Quad Cities personnel with operating experience have been providing input to the load tabulations.

The load tables have been revised to incorporate comments from Quad Cities, provide better references and to incorporate "lessons learned" from the recently completed Dresden degraded voltage analysis. The revised tables and assumptions are attached.

The degraded voltage analysis must be completed for Unit 2 prior to restart. To support this effort, it is requested that the load tables be reviewed and signed by March 25, 1992.

Please call Mike Tucker on extension 7648 at Downers Grove if you have any questions related to the load tables or to the degraded voltage analysis.



M.L. Reed
 E/I&C Design Superintendent

quad loads\QCLTCVR.DOC

cc: J.W. Wethington H.L. Massin (w/o att.)
 M.L. Reed M.F. Pietraszewski (w/o att.)
 D.C. Bucknell C.H. Norton
 D.V. Lubbe R.E. Charneski
 M.S. Tucker R.M. Schiavoni (S&L)
 NEDCC

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DATE: 8913-69
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LOAD ASSUMPTIONS FOR
DEGRADED VOLTAGE ANALYSIS
QUAD CITIES STATION

1. Load data, such as motor horsepower, power factor and efficiency, is taken from the preliminary ELMS input data sheets with the exception of the PCP battery chargers (125 and 250 Volt Battery Chargers). The value given in the vendor manual is used. Although the ELMS run is preliminary, the load data is assumed to be correct.
2. The voltage drop between unit substation transformers and the 480 Volt switchgear has been neglected. The secondary of this transformer is directly connected to an extension of the switchgear bus bar. The impedance of this bus section is insignificant in comparison with the cable and transformer impedance.
3. The load conditions are as shown in Appendix A. This information was supplied by Quad Cities Station personnel having reactor operating experience.
4. Motor operated valve (MOV) currents are neglected for running conditions. The operation of the MOVs may cause a temporary (less than one minute) dip in voltage at the motor terminals to below 90% of rated voltage. This may result in heating of the motor windings. The short duration of this dip is unlikely to cause sudden failure of the motor. Heat rise is a cumulative effect which is dependent on the insulation class and service factor of the motor. It is further assumed that the modest heat rise from this voltage dip from MOV operation causes a negligible reduction in motor life.

Under starting conditions for the Diesel Generator Cooling Water Pump, there are three valves which change state concurrent with the LOCA signal: the recirc. pump discharge valve (MOV 202-5A or 202-5B) and the LPCI Inboard PCI valve (MOV 1001-28A or 1001-28B). These two valves operate on a reactor pressure permissive of 900 psia signal (LPCI loop select logic), which may occur within a very brief time of the LOCA signal (2.5 pounds drywell pressure); therefore, the current from these MOVs is included in the starting case. In general, other MOV motors do not start to operate for the large break LOCA until several seconds into the event, allowing the starting currents to decay to running current levels. For large break conditions, the MOVs of injection valves (LPCI and core spray) do not start to operate for approximately 35 seconds after the ECCS initiation signal. This is from an interlock on reactor pressure (350 psia).

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5. The operation of the drywell coolers will be neglected for the running voltage analysis. The operation of the drywell coolers will be included in the starting voltage analysis. The Quad Cities Emergency Operating Procedures instruct the operator to initiate drywell sprays at a containment pressure of greater than 9 psia. Prior to the initiation of drywell sprays the drywell coolers are tripped. It is estimated that, for large break LOCA, drywell sprays will be initiated within 2 minutes of the ECCS initiation.
- The operation of the drywell coolers may cause a temporary dip in voltage at the motor terminals to below 90% of rated voltage. This may result in heating of the motor windings. The short duration of this dip is unlikely to cause sudden failure of the motor. Heat rise is a cumulative effect which is dependent on the insulation class and service factor of the motor. The short duration of this voltage dip is assumed to have a negligible reduction in motor life. *Must verify this assumption for a small break LOCA, or design a plant modification to trip the drywell coolers on high drywell pressure / low-low reactor water level logic.*
6. The voltage dip from loads neglected under the previous assumptions will not cause the critical motor load under study to stall. Verification of this assumption will require a review of the motor torque-speed characteristics with the pump load. Any available pump characteristics will need to be retrieved and evaluated when specific pumps are identified.
7. The neglected voltage dips will not cause the overload device to trip from the increased current. The setting of the overload must be reviewed to justify this assumption.
8. Other intermittent loads, such as sump pumps, drain tank pumps, and area cooling units, have an assumed duty cycle of 30%. The number of intermittent loads varies for each load case and condition. 30% of the intermittent loads (rounded up to the nearest whole number) are considered to be on. The largest loads are considered for conservatism. For the winter load case, all area cooling units are assumed off and all heaters are assumed on (not intermittent). For the summer case, all area cooling units are considered on continuously.
9. LOCA causes normal reactor SCRAM (no ATWS considered). Therefore, Standby Liquid Control System is not actuated and load on Reactor Protection MG set drops from value given in BOP ELMS to 75% of value shown (22 BHP X 75%=16.5 BHP) *Must verify this assumption.*
10. EDG Starting Air Compressor is assumed off under the starting voltage condition and on under the running voltage condition.

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11. EDG Vent fan starts when EDG is at 800 rpm. The EDG Cooling Water Pump starts from Relay SDR, which in turn is initiated from the fast start relay (FSR). It is assumed that there is approximately six seconds between pump and fan start. The pump starting current will have decayed to a value close to the running current by the start of the vent fan. Therefore, the vent fan is considered on only for the running condition.
12. The ACAD Air Compressor is assumed off. This is used to force air into the containment for dilution of hydrogen. Significant amounts of hydrogen are not expected until very late in the event, when many of the other motors would be secured. *Must verify this assumption.*
13. EDG Oil Transfer pump is assumed off for starting condition and on for running condition.
14. The resistance of the overload heaters has been neglected. The value of this resistance is small compared to the cable impedance. The critical loads appear to be larger motors; for smaller loads (less than 5 HP) this assumption would require verification. However, for the larger motors, the overall impedance is bounded by the accuracy of impedance of the cable based on the accuracy of the cable length. Therefore, neglecting the heater resistance has a negligible impact on calculational accuracy.
15. The internal impedance of switchgear 19 and the MCC's is negligible compared to the impedance of the cables and transformer 19.
16. Motors are assumed to be constant KVA loads over the voltage range of interest, as is the UPS Panel 902-63. All motors on switchgear 19 and associated MCC's are three phase induction motors.
17. All other loads are assumed to be constant impedance loads.
18. The voltage rating of the Control Room Standby HVAC motors is 460 V per NUS (letter in file). All other voltage ratings taken from ELMS Input Data sheets.
19. To obtain values for total current, a terminal voltage of 414V is used for motors (90% of 460) and 432V for non-motor loads (90% of 480) independent of actual equipment rated voltage.

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20. Under extremely degraded voltage conditions (less than 90% of rated voltage), heaters are assumed to cycle on more often or remain on for longer periods. Low voltage levels will not damage the heaters; rather, the heater will simply not provide as much heat. The reduced heat output is assumed to be sufficient for the intended purpose. The exception to this is the Control Room Standby HVAC (Train B) Air Filter Unit Heater. This heater requires a minimum of 438 Volts to provide the technical specification requirement on filter efficiency. *Must verify this assumption.*
21. The output voltage of the battery chargers will drop when less than 90% of rated input voltage is available. This will result in a "Battery Low Voltage" alarm before the battery discharges to a point where there is insufficient energy available from the battery to supply the load profile.

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3/20/92

Station: id Cities Units: 1

Date: 3-23-92

Concurrence: DB 3-24-92

Date:

Concurrence: DB 3-24-92

Load Center: SWGR 19

Comments	By	Equipment Number	LOCA Time Zero	RHR SW Initiation	CR Sdby HVAC	Post LOCA Steady State	Remarks	SR or NSR
		1-1902B	ON	ON	ON	ON		NSR
		1-3701B	ON	ON	ON	ON		NSR
		1-5704B	TRIP	OFF	OFF	OFF	TRIP ON HIGH RAD OR GROUP 1	NSR
		1-5704C	TRIP	OFF	OFF	OFF	TRIP ON HIGH RAD OR GROUP 2	NSR
		1-5703A	TRIP	OFF	OFF	OFF	TRIP ON HIGH RAD OR GROUP 3	NSR
		1-5705C	ON	ON	ON	ON		NSR
		1-5702B	ON	ON	ON	ON		NSR
		1-3903	START	ON	ON	ON		SR
		1/2-3701C	ON	ON	ON	ON		NSR
		480V MCC 19-1	ON	ON	ON	ON		SR
		480V MCC 19-2	ON	ON	ON	ON		SR
		480V MCC 19-3	ON	ON	ON	ON		SR
		480V MCC 19-4	ON	ON	ON	ON		SR
		480V MCC 18/19-5	ON	ON	ON	ON		SR
		480V MCC 19-6	ON	ON	ON	ON		SR

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QCLOADS.XLS

Preparer: *TS/SL* Concurrence: *DOB 5-24-92* Date: *3-23-92*

Load Center: MCC 19-1

Load Name	Equipment Number	LOCA Time Zero	RH-R SW Initiation	CR Sldby HVAC	Post LOCA Steady State	Remarks	SR or NSR
HVAC SPLY FAN#1 NORMAL FEED	1-5727	OFF	ON	ON	ON	START 800 RPM	SR
CORE SPRAY EMERG AHU 1B	1-5748B	OFF	ON	ON	ON	THERMOSTAT	SR
ALT FD DG#2 FUEL OIL XFRRPMP	2-5203-1	OFF	OFF	OFF	OFF		SR
DG FUEL OIL XFRR PMP #1	1-5203-1	OFF	OFF	OFF	ON		SR
120/208V XFMR FD 19-1-1		ON	ON	ON	ON		SR
STANDBY LOD CNTRL PMP 1B	1-1102B	OFF	OFF	OFF	OFF		SR
RH-R EMERG AHU 1B	1-5746B	OFF	ON	ON	ON	THERMOSTAT	SR
F1 WTR CLNUP 8Y8 FLTR							
HOLDING PMP	1-1279-2B	OFF	ON	ON	ON	START ON LO FLOW AFTER GROUP III	NSR
DRYWELL & TORUS PRG EXH FAN	1-5706-1B	OFF	OFF	OFF	OFF		NSR
HPCI EMERG AHU	1-5747	OFF	ON	ON	ON	THERMOSTAT HIGH TEMP. IN ROOM	SR
RESIN FEED TRK AGITATOR	1-1279-116	OFF	OFF	OFF	OFF		NSR
HPCI CLG WTR GLN SL COND PMP	2301-57	OFF	OFF	OFF	OFF		NSR
ALT FD DG RM HVAC SPLY FAN2	2-5727	OFF	OFF	OFF	OFF		SR
RA WTR CLNUP 8Y8 RECIRC PMP 1B	1-1205B	TRIP	OFF	OFF	OFF	TRIP ON GROUP III	NSR
POST LOCA H2 O2 MON PMP 1B	2252-81B	OFF	ON	ON	ON	MANUAL START AFTER LOCA	SR
ALT FD RH-RS EMERG AHU 2B	2-5746B	OFF	OFF	OFF	OFF		NSR
RX WTR CLNUP SYS BOILER VLV	1-1201-80	START	OFF	OFF	OFF	OLD988 ON GROUP III	NSR
HPCI TURB STM SUPPLY VLV	1-2301-4	OFF	OFF	OFF	OFF	STROKES @ 100#, BETWEEN T=0 & RH-R SW INITIATION	SR
RH-RS HX REV INLET VLV	1-1001-186B	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
CORE SPRAY OTBD ISOL VLV 1B	1-1402-24B	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
CORE SPRAY INBD ISOL VLV 1B	1-1402-25B	OFF	OFF	OFF	OFF	STARTS AT 325 PSL ASSUMED NON-COINCIDENT WITH VALVES STARTING @ 900 PSI	SR
CORE SPRAY TEST BYPASS VLV 1	1-1402-4B	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
RH-RS HX NORM OUTLET VLV	1-1001-185B	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
RH-RS HX REVERSE OUTLET VLV	1-1001-187B	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
HPCI TANK HEATER		OFF	OFF	OFF	OFF		SR
RH-RS HX NORMAL INLET VLV	1-1001-4B	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
CORE SPRAY PUMP SUCTION VLV 1B	1-1402-3B	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
CLOSED COOLING WTR HEADER ISO. VLV	1-3701	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR

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PROJECT NO: 8913-69

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3/20/97

Appendix 4 - Load Tables (Pre-Mode)

Station: ad Chiles Units: 1

Preparer: *W. J. J. J.* Concurrency: *U*

Date: 3-23-92

Concurrency: DCB 3-24-92

Date:

Load Center: MCC 19-2

Comments By	Load Name	Equipment Number	LOCA Time Zero	RHR SW Initiation	CR Stdby HVAC	Post LOCA Steady State	Remarks	SR or NSR
	RECIRC MG SET VENT FAN 1A	1-5701	ON	ON	ON	ON		NSR
S&L	RX PROT M-G SET 1B		ON	ON	ON	ON	DROPS LOAD, SEE ASSUMPTION 9	NSR
	DG STARTING AIR COMPR 1B		OFF	ON	ON	ON	STARTS SOON AFTER LOCA	SR
	250VDC BATTERY CHARGER #1		ON	ON	ON	ON		SR
	DG STARTING AIR COMPR 1A		OFF	ON	ON	ON	STARTS SOON AFTER LOCA	SR
	125VDC BATTERY CHARGER #1		ON	ON	ON	ON		SR
	TURB BLDG EMERG LGTS		OFF	OFF	OFF	OFF		NSR
S&L	ALT PD DG2 CLG WTR PMP CLR FANS A & B		OFF	OFF	OFF	OFF		SR
	RHR SW PMP 1C CLR FAN A		OFF	START	ON	ON		SR
	RHR SW PMP 1C CLR FAN B		OFF	START	ON	ON		SR
	RHR SW PMP 1C CLR FAN C		OFF	START	ON	ON		SR
	RHR SW PMP 1C CLR FAN D		OFF	START	ON	ON		SR
S&L	DG1 CLG WTR PMP CLR FAN A		START	ON	ON	ON	STARTS ON DGCWP START	SR
S&L	DG1 CLG WTR PMP CLR FAN B		START	ON	ON	ON	STARTS ON DGCWP START	SR
	RHR SW PMP 1D CLR FAN A		OFF	START	ON	ON		SR
	RHR SW PMP 1D CLR FAN B		OFF	START	ON	ON		SR
	RHR SW PMP 1D CLR FAN C		OFF	START	ON	ON		SR
	RHR SW PMP 1D CLR FAN D		OFF	START	ON	ON		SR
	RX FD PUMP VENT FAN 1B	1-5707B	ON	ON	ON	ON		NSR

Preparer: *[Signature]*Concurrence: *[Signature]*

Date: 3-23-92

Concurrence:

DCB 3-24-92

Date:

Load Center: MCC 19-3

Comments

By

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Load Name	Equipment Number	LOCA Time Zero	RHR SW Initiation	CR Stdbby HVAC	Post LOCA Steady State	Remarks	SR or NSR
TURB BEARING LIFT PMP 1A	1-5620A	OFF	ON	ON	ON		NSR
TURB BEARING LIFT PMP 1B	1-5620B	OFF	ON	ON	ON		NSR
TURB BEARING LIFT PMP 1C	1-5620C	OFF	ON	ON	ON		NSR
TURB BEARING LIFT PMP 1D	1-5620D	OFF	ON	ON	ON		NSR
TURB BEARING LIFT PMP 1E	1-5620E	OFF	ON	ON	ON		NSR
TURBINE TURNING GEAR	1-5600	OFF	ON	ON	ON		NSR
TURB TURNING GEAR OIL PMP	1-5908	OFF	ON	ON	ON		NSR
DRYWELL CLR BLOWER 1B	1-5788E	ON	OFF	OFF	OFF	SECURED BY OPERATOR PRIOR TO INITIATING DRYWELL 1 PRAY	NSR
TL BEARING TURNING GEAR		OFF	ON	ON	ON		NSR
PLUGBACK MOTOR		OFF	ON	ON	ON		NSR
TURBINE OIL CENTRIFUGE		OFF	OFF	OFF	OFF		NSR

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Station: ad Cities Units: 1

Preparer: *M. Fisher* Concurrency: *4* Date: *3-27-92* Concurrency: *DCB 3-24-92* Date:

Load Center: MCC 19-4

Comments	By	Load Name	Equipment Number	LOCA Time Zero	RHR SW Initiation	CR Stdbby HVAC	Post LOCA Steady State	Remarks	SR or NSR
S&L		DRYWELL CLG BLOWER 1D	1-5788D	ON	OFF	OFF	OFF	SECURED BY OPERATOR PRIOR TO INITIATING DRYWELL SPRAY	NSR
S&L		SBGT AIR HTRS	1/2-7503B	START	ON	ON	ON	START ON HI RAD OR GROUP 8	SR
S&L		SBGT FAN	1/2-7506B	START	ON	ON	ON	START ON HI RAD OR GROUP 8	SR
		ACAD AIR COMP		OFF	OFF	OFF	OFF		SR
S&L		DRYWELL/TDRS DIFF PRESS COMP 1B	1-5740-1B	TRIP	OFF	OFF	OFF	TRIPS ON GROUP 8 ISOLATION OF SUCTION	NSR
DVL/S&L		RX BLDG VENT TO STANDBY GAS	1-7503	OFF	OFF	OFF	OFF	CLOSE ON OTHER UNIT HIGH RAD OR GROUP 8	SR
S&L		SBGT OUTSIDE AIR SUPP DMPR	1/2-7504B	START	OFF	OFF	OFF	START ON HI RAD OR GROUP 8	SR
S&L		SBGT SYS FAN DISCH DAMPER	1/2-7507B	START	OFF	OFF	OFF	START ON HI RAD OR GROUP 8	SR
S&L		SBGT SYS INLET DAMPERS	1/2-7505B	START	OFF	OFF	OFF	START ON HI RAD OR GROUP 8	SR
		RHRS CONTAIN SPRAY ISOL VLV	1-1001-26B	OFF	ON	OFF	OFF	4 OF 8 COULD BE ON AT TIME OF RHR SW INITIATION; FIRST 4 ARBITRARILY TAKEN AS ON	SR
		RHRS BACKUP CONTAIN SPRAY	1-1001-23B	OFF	ON	OFF	OFF	AS ABOVE	SR
		RHRS MN SHUTOFF SUPP VLV 1B	1-1001-34B	OFF	ON	OFF	OFF	AS ABOVE	SR
		RHRS SUPP CHAMBER DUMPLINE	1-1001-36B	OFF	ON	OFF	OFF	AS ABOVE	SR
		RHRS SUPP CHAMBER SPRAY HDR	1-1001-37B	OFF	OFF	OFF	OFF	4 OF 8 COULD BE ON AT TIME OF RHR SW INITIATION; LAST 4 ARBITRARILY TAKEN AS OFF	SR
		RHRS COOLING PMP CROSS HDR	1-1001-19B	OFF	OFF	OFF	OFF	"AS ABOVE"	SR
		RHRS HX R1003B BYPASS VLV 1B	1-1001-16B	OFF	OFF	OFF	OFF	"AS ABOVE"	SR
		RHRS CNMT COOLANT HX VLV 1B	1-1001-5B	OFF	OFF	OFF	OFF	"AS ABOVE"	SR
		RHRS SHUTDOWN COOLING VLV 1	1-1001-43C	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
		RHRS SHUTDOWN COOLING VLV 1	1-1001-43D	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
		RHRS COOLANT 1002C PMP SUCT	1-1001-7C	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
		RHRS COOLANT 1002D PMP SUCT	1-1001-7D	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR

DISC: QC-EPED-0439-01
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Preparer: *John T. Tolson* Concurrence: *[Signature]*Date: *3-23-92* Concurrence: *DCB 3-24-92*

Date:

Load Center: MCC 18/19-5

Comments	Load Name	Equipment Number	LOCA Time Zero	RHR SW Initiation	CR Sdby HVAC	Post LOCA Steady State	Remarks	SR or NSR
By	CONTROL RM RTN AIR FAN 1/2	1/2-5795-30	TRIP	OFF	OFF	OFF		SR
DVL	RX WTR RECIPRO LOOP EQUAL VLV 1A	1-202-6A	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
S&L	RX WTR RECIPRO PMP SUCT VLV 1A	1-202-4A	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
S&L	RX WTR RECIPRO PMP DISCH VLV 1A	1-202-5A	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
S&L	RHRS INBOARD SHUTOFF VLV 1A	1-1001-29A	START	OFF	OFF	OFF	START AT 900 PSI	SR
S&L	RHRS OUTBOARD SHUTOFF VLV 1A	1-1001-28A	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
S&L	RL WTR RECIPRO LOOP EQUAL BYPASS VLV 1A	1-202-9A	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
S&L	RX WTR RECIPRO LOOP EQUAL VLV 1B	1-202-6B	START	OFF	OFF	OFF	START AT 900 PSI	SR
S&L	RX WTR RECIPRO PMP SUCTION VLV 1B	1-202-4B	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
S&L	RX WTR RECIPRO PMP DISCH VLV 1B	1-202-5B	START	OFF	OFF	OFF	START AT 900 PSI	SR
S&L	RHRS INBOARD SHUTOFF VLV 1B	1-1001-29B	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
S&L	RHRS OUTBOARD SHUTOFF VLV 1B	1-1001-28B	OFF	OFF	OFF	OFF	START AT 826 PSI ASSUMED NON-COINCIDENT WITH VALVES STARTING @ 900 PSI	SR
S&L	RX WTR RECIPRO LOOP EQUAL BYPASS VLV 1B	1-202-9B	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR

DIT NO: QC-EPED-0489-01
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Station: id Cities Units: 1

Preparer: *W. Fisher* Concurrence: *Uth*Date: *3-23-92*Concurrence: *DCB 3-24-92*

Date:

Load Center: MCC 19-8

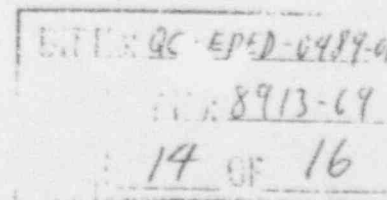
Comments

By

S&L

S&L

Load Name	Equipment Number	LOCA Time Zero	RHR SW Initiation	CR Stdby HVAC	Post LOCA Steady State	Remarks	SR or NSR
DRYWELL CLG BLOWER 10	1-5788C	ON	OFF	OFF	OFF	SECURED BY OPERATOR PRIOR TO INITIATING DRYWELL SPRAY	NSR
DRYWELL CLG BLOWER 10	1-5788G	ON	OFF	OFF	OFF	SECURED BY OPERATOR PRIOR TO INITIATING DRYWELL SPRAY	NSR



185290

March 23, 1992
In Reply, Refer to

CHRON #

Mr. C.A. Moerke
Site Engineering Supervisor
Quad Cities

Subject: Load Shed Modifications
Degraded Voltage Analysis
Station 4, Quad Cities

Dear Mr. Moerke:

E/I&C has performed additional degraded voltage analyses at the request of Quad Cities Station personnel. This was in an effort to avoid tripping the Drywell Cooling blowers and the unit RBCCW Pumps. This analysis has concluded that the trip of RBCCW is essential for resolution of the degraded voltage issue.

Quad Cities has recommended tripping the Fuel Pool Cooling Pumps in addition to the loads presently included in the load shed modification. Fuel Pool Cooling will not function without RBCCW; therefore, there is little need to retain this function. E/I&C concurs with this recommendation. Tripping the Fuel Pool Cooling Pumps on a LOCA signal will provide additional margin which may offset cable replacements. An evaluation of the need for cable replacements when the Fuel Pool Cooling Pumps are tripped is in progress.

The Fuel Pool Cooling Pumps should be added to the scope of the current load shed modifications and an additional ECN prepared to incorporate this new trip if the additional work scope does not jeopardize unit restart. A revised list of loads to be shed on a LOCA signal is attached.

If you have any questions, please call Mike Tucker on extension 7648 at Downers Grove.

Prepared: M.S. Tucker
M.S. Tucker
Senior Engineer

Date: 3/23/92

Approved: M.L. Reed
M.L. Reed
E/I&C Design Superintendent

Date: 3/23/92

DEGRDEDVLTS\QUAD\FPCOOLPT.DOC

cc: J.W. Wethington D.V. Lubbe
M.F. Pietraszewski M.L. Reed
M.S. Tucker NEDCC

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Quad Cities
Degraded Voltage Analysis

Load Shed Modifications

The following loads are to be tripped on a LOCA signal
(High Drywell Pressure or Low Low Reactor Water Level, i.e., the same signal that starts the diesel generators)

Drywell Cooler Blowers

Blower 1A, MCC 18-1A ✓
Blower 1B, MCC 18-1B ✓
Blower 1C, MCC 19-6 ✓
Blower 1D, MCC 19-4 ✓
Blower 1E, MCC 19-3 ✓
Blower 1F, MCC 18-1B ✓
Blower 1G, MCC 19-6 ✓

Blower 2A, MCC 28-1A ✓
Blower 2B, MCC 28-1B ✓
Blower 2C, MCC 29-6 ✓
Blower 2D, MCC 29-4 ✓
Blower 2E, MCC 29-3 ✓
Blower 2F, MCC 28-1B ✓
Blower 2G, MCC 29-6 ✓

RBCCW Pumps

Pump 1A, 480V Switchgear 18 ✓
Pump 1B, 480V Switchgear 19 ✓
Pump 1/2C, 480V Switchgear 19 ✓

Pump 2A, 480V Switchgear 28 ✓
Pump 2B, 480V Switchgear 29 ✓
Pump 1/2C, 480V Switchgear 29 ✓

Recirc MG Set Vent Fans

Fan 1A, MCC 19-2 ✓
Fan 1B, MCC 18-2 ✓

Fan 2A, MCC 29-2 ✓
Fan 2B, MCC 28-2 ✓

Turbine Building Exhaust Fans

Fan 1C, 480V Switchgear 19 ✓

Fan 2C, 480V Switchgear 29 ✓

Turbine Building Supply Fans

Fan 1A, 480V Switchgear 18 ✓
Fan 1B, 480V Switchgear 19 ✓

Fan 2A, 480V Switchgear 28 ✓
Fan 2B, 480V Switchgear 29 ✓

Fuel Pool Cooling Pumps

Pump 1A, 480V Switchgear 18 ✓
Pump 1B, 480V Switchgear 19 ✓

Pump 2A, 480V Switchgear 28 ✓
Pump 2B, 480V Switchgear 29 ✓

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ENGINEERS

Calc. For Quad Cities 1/11 Safety-related Continuous	
Load Running/Starting Voltages	
<input checked="" type="checkbox"/> Safety-Related	<input type="checkbox"/> Non-Safety-Related

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Prepared by <i>Zheng Duan</i>	Date 5-2-92
Reviewed by <i>Ping L. Lee</i>	Date 5/2/92
Approved by <i>Al Schmitt</i>	Date 5/4/92

I. ISSUE SUMMARY

Revision 0, Initial Issue, Page 1 through 27, A1 through A73, and B1 through B16.

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Prepared by	Date
Reviewed by	Date
Approved by	Date

II. METHOD OF REVIEW

QA CALCULATION REVIEW CHECKLIST TYPE OF CALCULATION

- ☐ Hand-Prepared Design Calculation Only
- ☐ Computer-Aided Design Calculation Only
- ☒ Both hand-Prepared and Computer Aided Design Calculation

FOR HAND-PREPARED DESIGN CALC (check the appropriate items)

- ☒ Detailed review of the original calculation.
- ☐ Review by an alternate, simplified or approximate method of calculation.
- ☐ Review of a representative sample of repetitive calculations.
- ☐ Review of the calculation against a similar calculation previously performed.

FOR COMPUTER-AIDED DESIGN CALC (check the appropriate items)

- ☒ A review to determine if the engineering design and analysis computer program(s) used have been validated and documented and that the calculation, regardless of the program used, contains all the necessary documentation for reconstruction at a later date. (MUST BE PERFORMED)
- ☒ A review to verify that the computer program is suitable to the problem being analyzed. (MUST BE PERFORMED)
- ☒ A review to determine if the input data as specified for program execution is consistent with the design input, correctly defines the problem for the computer program algorithm and is sufficiently accurate to produce results within any numerical limitation of the program. (MUST BE PERFORMED)
- ☒ A review to verify that the results obtained from the program are correct and within stated assumptions and limitations of the program and are consistent with the input. (MUST BE PERFORMED)
- ☐ Validation documentation for temporary changes to listed programs or developmental programs or unique single application programs shall be reviewed to assure that methods used adequately validate the program for the intended application. (WHERE APPLICABLE)

REVIEWER: Ping L. Lau DATE: 5/2/92

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III. PURPOSE

The purpose of this calculation is to evaluate the terminal voltage of all safety-related services at Unit 1, Division II for the following operating cases:

• Case A

With the 4.16 KV bus 14-1 voltage at 3845 V, the running voltage at terminals of continuous duty safety-related services for the four loading conditions as defined by Commonwealth Edison Company (CECO).

• Case B

With the 4.16 KV bus 14-1 voltage at 3845 V, the terminal voltage of the safety related continuous duty motors during block starting in condition 1 and 2 as identified by CECO in the Load Table (Reference V.A).

Evaluation of Motor Operated Valves, control circuits, and the effects of operation at low voltage on the protective device settings is not in the scope of this calculation.

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V. REFERENCES

- A. Sargent & Lundy (S&L) Design Information Transmittal (DIT) No. QC-EPED-0489-01, dated 4-1-92.
 - . Load Tables and Assumptions and Load Shedding List for Division II, Unit 1.
- B. S&L DIT No. QC-EPED-0470-01, dated 4-16-92.
 - . Safety Related Service Feed Cable Data
- C. S&L DIT No. QC-EPED-0549-00, dated 4-10-92.
 - . Motor Nameplate Walkdown Data
- D. S&L DIT No. QC-EPED-0540-00, dated 4-8-92.
 - . Thermal overload heater catalog numbers
- E. S&L Calculation 4266/19AZ13, Revision 1, dated 10-31-91.
 - . Thermal overload heater temperature compensation and 85% of motor rated start-up voltage requirement.
- F. Panafax Message from Scott Jacobs (GE) to G. J. Hinshaw (S&L), Dated January 28, 1988
 - . GE Overload Heater Resistances
- G. S&L Standard ESA-102 (June 28, 1991)
 - . Low Voltage Cable Impedances Ohms/100 Feet (90°C)
- H. S&L Standard ESC-193 (November 28, 1989)
 - . Consideration of Overload Heater Resistance
- I. S&L DIT No. QC-EPED-0522-00, dated 3-6-92.
 - . Latest computer data file for QUAD CITIES Unit 1 ELMS-AC analysis to be used as base file for this calculation.
- J. S&L Program ELMS-AC, Version 2.2, Computer Program No. 03.7-043-2.2
- K. NEMA Standard MG 1-1987, Part 10, "Ratings-AC Small and Medium Motors", and Part 12, "Tests and Performance - AC Small and Medium Motors"

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V. REFERENCES (Continued)

- . Running Voltage and Locked Rotor Torque Requirements for Motors
- L. S&L DIT No. QC-EPED-0546-00, dated 4-9-92
 - . Cable Length and Size of Feeders from Switchgear 19 to downstream MCCs.
- M. S&L DIT No. QC-EPED-0534-00, dated 3-27-92
 - . Battery Charger Data
- N. *Direct Current Transmission*, by Edward W. Kimbark, Vol. 1 Wiley-Interscience, 1971
 - . Rectifier Performance
- O. S&L DIT No. QC-EPED-0531-00, dated 3-26-92.
 - . Data for Turbine Turning Gear and Piggyback Motor used in ELMS-AC file
- P. Telephone Memorandum, between J. Mitchell (Power Conversion) and J. B. Wisniewski (S&L), dated 1-7-92.
 - . Battery Charger Power Factor.
- Q. Letter from J. A. Mitchell (Westinghouse) to J. A. Clements (Bechtel), dated 4-15-86.
 - . Minimum Starting Voltage for SBTG Fan Motor.
- R. S&L DIT No. QC-EPED-0556-00, dated 4-16-92
 - . Field Walk-down Data for DG Cooling Water Pump Cooler Fans.
- S. S&L DIT No. QC-EPED-0555-00, dated 4-16-92
 - . DGCWP Field Walk-down Data.
- T. S&L Calculation 8913-73-19-2, Rev. 0, "Evaluation of DG 2 Cooling Water Pump Cooler Fan A & B Minimum Starting Voltage", dated 4-3-92

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V. REFERENCES (Continued)

- U. S&L Specification R-2317, Revised date 4-13-67
 - . Quad Cities Units 1 & 2 Specification for Miscellaneous Pumps.
- V. Telecopy (FAX) from Dave Barton (Moline District Office) to J.B. Wisniewski (S&L), dated 3-20-92.
 - . Performance Data of Lincoln Electric DGCWP motor.
- W. S&L Calculation 8913-67-19-2, Rev. 0, dated 4-15-92
 - . Minimum Starting Voltage for DGCWP at Quad Cities 1/II
- X. S&L Calculation 8913-73-19-1, Rev. 0, dated 4-15-92
 - . Degraded Voltage Calculation for Quad Cities 2/II
- Y. Letter from R. M. Schiavoni (S&L) to M. S. Tucker (CECo), dated 4-30-92
 - . Justification for two overload heater resistances.
- Z. S&L DIT No. QC-EPED-0571-00, dated 5-1-92
 - . Correction on four valve load names in file Q1A4.M05

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VI. INPUT DATA

1. GE Heater Resistances (Reference V.F):

<u>GE Catalog No.</u>	<u>Heater Resistance (Ohm)</u>
CR123C1.84A	0.915
CR123C2.20A	0.626
CR123C2.39A	0.518
CR123C2.68A	0.428
CR123C3.01A	0.355
CR123C3.26A	0.294
CR123C5.26A	0.065
CR123C5.92A	0.054

2. Cable Impedance in Ohms per 100 feet at 90 Degree C (Reference V.G):

<u>Cable Size</u>	<u>R</u>	<u>X</u>
#14 AWG	.328	.00418
#10 AWG	.130	.00365
#6 AWG	.0513	.00341
#2 AWG	.0203	.00306
1/0 AWG	.0128	.00292
4/0 AWG	.00639	.00274
250 MCM	.00542	.00273
350 MCM	.00389	.00266

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VII. ASSUMPTIONS

- A. It is assumed that the values of overload heater resistance (Reference V.F) provided by the heater manufacturer, General Electric (G.E.), are suitable for calculating the motor starting and running voltages without requiring any adjustment for temperature. As discussed in Reference V.E, GE has stated that the heaters supplied to LaSalle Nuclear Station maintain essentially constant resistance for increases in heater temperature. Based on the GE response on the LaSalle GE heaters, it is reasonable to assume the GE overload heaters at Quad Cities Station also maintain essentially constant resistance for increases in heater temperature. This assumption does not require verification.
- B. As discussed in S&L Standard ESC-193, motors 200 hp and smaller normally are 460 V motors specified to comply with NEMA MG-1, which requires motors to start and run with 90% of motor rated voltage at the motor terminals. However, for most loads, these motors will start with 80% or 85% motor rated voltage at the motor terminals and ride through a dip to 75% rated voltage for 1 minute. The explanation of this capability is in NEMA Tables MG1-12.37 and MG1-12.38 which establish starting and breakdown torque requirements for these motors. Induction motors, depending on the size and speed, which can produce at rated voltage a starting torque equal to 100% to 275% of running torque, will produce at 80% of rated voltage a starting torque equal to 64% to 176% of running torque. Most mechanical loads have a break away (starting) torque less than 35% of full load torque. Therefore, NEMA MG-1 motors will start these loads with an applied terminal voltage substantially less than 90% rated voltage. This calculation is utilizing 85% of motor rated voltage as the minimum starting voltage requirement. This assumption does not require verification.
- C. Under degraded voltage conditions, the terminal voltages at electric heaters will be less than the rated value. Heaters are assumed to cycle on more often or remain on for longer period. The heat generated at reduced voltage is assumed to be sufficient for the intended purpose for all the heaters in Unit 1, Division II. This assumption needs verification by CECO.
- D. For the set of loads that are indicated 'Tripped' at certain operating condition in CECO's Load Table, these loads would be disconnected before or at the same time as another set of loads that are marked 'Start' actually start on the same operating condition. This means that both sets of loads will not be

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VII. ASSUMPTIONS (continued)

operating simultaneously during the period that the incoming motors are starting. This is confirmed by CECO (Reference V.X), therefore, no further verification is required.

- E. The AC input current to a rectifier, such as a battery charger is directly proportional to the output current, and since the DC system is operated in the steady state, the battery charger will be a constant current load. At high AC input voltage, the DC output is limited by delaying firing of the rectifiers or similar means. Under this condition, the AC power factor is low. However, with low input voltage, the firing of the rectifiers is not delayed in order to maintain a high DC output voltage. This results in a high power factor. Since the AC input voltage to the battery chargers will be low (MCC voltages), a high battery charger power factor (0.95) may be assumed. This assumption does not require verification. (References V.N & V.P).
- F. The SBTG OUTSIDE AIR SUPPLY DAMPER (0.1 h.p.) has GE overload heater model C0.36A. The resistance value for this heater is not available from the manufacturer's data sheet (Reference V.F). Since dampers are not considered as critical continuous loads in determining minimum 4.16 KV switchgear voltage requirements, the resistance of this overload heater will not affect the results of this calculation. Therefore the heater resistance is not included (assumed zero resistance) in the total feeder impedance for the subject damper. No verification is required for the purpose of this calculation only.
- G. Typical performance data have been assumed for the following loads (added to the ELMS-AC data file):

- . Closed Cooling Water Header Isolation Valve
- . Core Spray Pump Suction Valve 1B
- . Turbine Oil Centrifuge

The typical data for these loads are:

Rated Efficiency: 90%

Rated Power Factor: 85% (Except 67% calculated for Turbine Oil Centrifuge)

Locked Rotor Current: 625% (Except 648% calculated for Turbine Oil Centrifuge)

Starting P.F.: 20%

Based on CECO Load Table, these loads are OFF for all four conditions, therefore, the assumed values have no impact on the calculation, and no verification is required.

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VII. ASSUMPTIONS (continued)

- H. It is assumed that the TURBINE TURNING GEAR PIGGYBACK MOTOR has running power factor of 60% and efficiency of 85% which correspond to 1.4 hp rating based on 2.7A FLC. This motor has a comparatively short duty time and the rating of this motor is significantly smaller than its main service TURBINE TURNING GEAR MOTOR (60 hp). Therefore, possible variations in the values of power factor and efficiency will have a negligible effect on the calculation results. Consequently, no verification is required for this assumption.

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VIII. ACCEPTANCE CRITERIA

The minimum running voltage of the continuous duty motor is 90% of the motor rated voltage. This requirement is in accordance with industrial standard outlined in NEMA MG-1, Part 12, Section 12.44.1 (Reference V.K.).

The minimum motor starting voltage for continuous duty motors is 85% of the motor rated voltage except as noted below, and the justification for this criterion is stated in Assumption VII.B. The following motors have the indicated minimum starting voltage:

1. SBTG FAN - 75% of 460 V (Reference V.Q)
2. DG CLG WATER PUMP 1 - 70% of 460 V (Reference V.W)
3. DG 1 CLG WATER PUMP COOLER (Reference V.T, see note)
FAN A & B - 75% of 460 V

note: Reference V.T establishes the minimum starting voltage for Unit 2 DGCWP cooler fans. However, by comparing the field walk-down data in Reference V.R with the Unit 2 DGCWP cooler fan walk-down data in Reference V.T, it is found that both units use identical DGCWP cooler fan motors. Therefore, the 75% minimum starting voltage also applies to Unit 1 motors.

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IX. METHODOLOGY

Feed cable impedances are modeled for the safety-related services. If the service is a motor and rated no more than 3 hp, per S&L standard ESC-193, the overload heater resistance is also included in the feeder impedance. If there are two overload relay heaters in series, from Reference V.Y, heater resistance will be included for motors no more than 10 HP. The calculation is performed by using Program ELMS-AC, Version 2.2. The Existing ELMS-AC Data File Q1A4.M05 is modified for use in this calculation. The two cases as mentioned in Section III will be run on the modified data file. Modifications to the File Q1A4.M05 include:

- Model the 480 V safety related service feeder impedances by adding a terminal bus and using the feeder impedance as the connection data between the MCC and the terminal bus.
- Disable the existing two sources in the file for all operating conditions. Add dummy source 3 connected to 4160 V switchgear 14-1 valid for all four conditions in the file. Adjust the source 3 voltage such that the voltage at 4.16 KV Switchgear 14-1 is kept at 3845 V for all runs.
- Change the existing four operating conditions in the ELMS-AC file to the following four LOCA operating conditions as defined in the Load Table supplied by Commonwealth Edison Company (CECO) (Reference V.A):

Condition 1: LOCA Time Zero
Condition 2: RHR SW Initiation
Condition 3: CR STANDBY HVAC Initiation
Condition 4: Post LOCA Steady State

It should be noted that these new operating conditions only apply to Division II loads that are listed in CECO's Load Table. Although loads outside this division still remain in the data file, their values are not adjusted to the defined operating conditions. However, their values are irrelevant to this calculation.

- Adjust loadings at different operating conditions to those defined in the CECO Load Table and Load Shedding List (Reference V.A), with the brake horsepower determined in the following order of preference:

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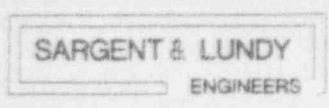
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IX. METHODOLOGY (Continued)

1. Specified in CECO Load Table Assumptions, or any other documents.
 2. Existing file, condition 3.
 3. Existing file, other conditions.
 4. 90% of the nameplate rated brake horse power.
- Change Diesel Generator Cooling Water Pump Data as indicated in References V.S, U, V.
 - Change 125 V and 250 V Battery Charger KVA rating to the calculated value based on the nameplate data given in Reference V.M., and Power Factor as in Assumption VII.E.
 - Manually reduce resistive type loads (Type 'R') KVA or KW value according to the bus operating voltage such that they are being treated as constant impedance type loads in the current version of ELMS-AC (The program treats all loads as constant KVA). An exemption to this is the battery chargers. The battery chargers are marked as 'R' type loads but are being treated as constant current loads.
 - Reenter the feed cable impedance from switchgear 19 to each down-stream MCC.
 - Change the rated HP of DG 1 Cooling Water Pump Cooler Fan A & B from 0.8 to 1.5 according to the field walk-down data (Reference V.R)
 - Add the following loads to the ELMS-AC data file.
 - . TURBINE TURNING GEAR PIGGY BACK MOTOR (MCC 19-3)
 - . TURBINE OIL CENTRIFUGE (MCC 19-3)
 - . CLOSED COOLING WATER HEADER ISOL VALVE (MCC 19-1)
 - . CORE SPRAY PUMP SUCTION VALVE 1B (MCC 19-1)



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IX. METHODOLOGY (Continued)

The calculations are performed at cable conductor temperature of 90 degrees Celsius for both running and starting cases.

There are eight identical RHR SW Pump Cooler Fans fed from MCC 19-2 through AWG #10 cable. They are block started on Condition 2 in CECO Load Table. To avoid redundancy, only the terminal bus for the motor with longest feed cable length (in this case Pump 1C Cooler Fan A) is modeled in the program to represent the worst case voltage profile among these motors. The acceptance of running and starting voltages of this motor also applies to the remaining seven motors.

Safety related electric heaters will not be used as limiting cases to determine the voltage requirements. This is based on the assumption that heaters will generate sufficient heat at the degraded voltage condition (Assumption VII.C).

For the block motor starting case study, the 4.16 KV Switchgear 14-1 voltage is set at 3845 V. The block motor starting feature in the ELMS-AC is used to simultaneously start multiple motors as marked 'Start' in CECO Load Table under conditions one and two respectively.

Voltages at motor terminals of all four conditions are compared for the running case, and the worst case voltage is to be used as the result for Case A.

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X. CALCULATION

1. Battery Charger Data.

Battery Charger AC Input Rating (Reference V.M)

Voltage: 480V, Current: 113A (250 V Charger); 48A(125 V Charger), Frequency: 60 Hz, 3 Phase.

Input KVA = $1.732 \times 480 \times 113 = 94$ KVA (250V Charger)

Input KVA = $1.732 \times 480 \times 48 = 39.9$ KVA (125V Charger)

Since the input KVA is used in the ELMS-AC file,
Efficiency is entered 100%.

Running Power Factor: 95 % (Assumption VII.E)

2. Data for Diesel Generator Cooling Water Pump (DGCWP) 1.

From the field walk-down data (Reference V.S):

Rated Voltage: 460 V

Rated Speed: 3525 rpm

Rated Horsepower: 100 hp

NEMA Design Code: E

From the purchase specification of DGCWP 1 (Reference V.U):

Brake Power = 90 HP

From Reference V.V:

Full Load Current = 116 A

Rated Efficiency = 88.5%

Therefore, the rated power factor can be calculated as:

$$PF_{rated} = \frac{0.746 \cdot 100}{\sqrt{3} \cdot 116 \cdot 0.46 \cdot 0.885} = 0.912$$

From Reference V.H, the typical starting power factor for 100 HP 2 pole induction motor is 37%

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X. CALCULATION (Continued)

From NEMA MG-1 (Reference V.K), for a NEMA design E motor, the upper limit of locked-rotor KVA per HP is 5.0, therefore,

$$LRC(\%) = \frac{5.0 \cdot 100 \cdot 100}{\sqrt{3} \cdot 116 \cdot 0.46} = 541$$

3. Calculation of MCC Feed Cable Impedances.

Based on Reference V.L, the feed cable impedance from Switchgear 19 to down-stream MCC's are calculated in the Table 1:

Table 1. Feeder Cable Impedances From Switchgear to MCC's

From Bus	To Bus	Cable Size	Cable Length (ft)	Total Resistance	Total Reactance
SWGR 19	MCC 19-1	250 MCM	347	0.0188074	0.0094731
SWGR 19	MCC 19-2	250 MCM	156	0.0084552	0.0042588
SWGR 19	MCC 19-3	250 MCM	392	0.0212464	0.0107016
SWGR 19	MCC 19-4	250 MCM	330	0.0178860	0.009009
SWGR 19	MCC 18/9-5	250 MCM	324	0.0175608	0.0088452
SWGR 19	MCC 19-6	350 MCM	350	0.013615	0.009310

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X. CALCULATION (Continued)

4. Turbine Turning Gear Piggyback Motor

The data to be entered in the ELMS-AC file are as follows:

From Reference V.O, Rated Voltage: 440V,

Full Load Current: 2.7A, Speed: 450 RPM.

From Assumption VII.H, Power Factor: 60%, Efficiency: 85%,
LRC: 625%, Starting Power Factor: 20% (typical values to be
entered in the program, not used in this calculation).

$$HP = \frac{\sqrt{3} \cdot 0.44 \cdot 2.7 \cdot 0.6 \cdot 0.85}{0.746} = 1.4$$

5. Turbine Oil Centrifuge Motor

From Reference V.C, Rated Power: 2 HP, FLC: 3.1 A, RPM: 1740

With 90% Efficiency (Assumption VII.G), the P.F. can be
calculated as:

$$PF_{rated} = \frac{0.746 \cdot 2.0}{\sqrt{3} \cdot 3.1 \cdot 0.46 \cdot 0.9} = 0.67$$

For NEMA code J (Reference V.C), the upper limit of Locked Rotor
KVA per HP is 8.0 KVA/HP, therefore:

$$LRC(\%) = \frac{8.0 \cdot 2 \cdot 100}{\sqrt{3} \cdot 3.1 \cdot 0.46} = 648$$

6. Calculation of Safety-related Service Feeder Impedance

For the loads given in References V.B as the safety-related
services in Division II, Unit 1, the load name, equipment
number, rated horsepower from Reference V.I, overload heater
catalog number from References V.D, and cable data from
References V.B are tabulated in Table 2, with total feeder
impedance calculated.

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X. CALCULATION (Continued)

Table 2. Safety related load feeder impedances.

SERVICE	Load No	RATED HP	CABLE SIZE	CABLE LENGTH (FT)	HEATER MODEL	TOTAL RESIS-TANCE	TOTAL REAC-TANCE
DG 1 CLG WATER PUMP 1	586	100	4/O	705	*	0.0450	0.0193
HPCI EMERG AIR HLG UNIT 1	597	3	AWG 14	520	C526A	1.7706	0.0217
HPCI CLG WTR SEAL COND PMP	599	25	AWG 6	465	*	0.2385	0.0159
RHRS EMERG AHU 1B	594	7.5	AWG 14	268	*	0.8790	0.0112
POST LOCA H2/O2 MTR PMP 1B	602	1	AWG 10	290	C220A	1.0030	0.0106
STBY LQD CONT PUMP 1B	593	50	AWG 2	428	*	0.0869	0.0131
NF DG OIL XFER PUMP 1	591	3	AWG 14	568	2*C268A	2.7190	0.0237
NF DG RM HVAC SUPPLY FAN 1	588	50	1/O	558	*	0.0714	0.0163
CORE SPRAY EMERG AHU 1B	589	5	AWG 14	298	*	0.9774	0.0125
HPCI TANK HEATER	612	9KW	AWG 10	454	*	0.5902	0.0166
AF DG OIL XFER PMP 2	590	3	AWG 14	856	C268A	3.2357	0.0358
AF RHR EMLRG AHU 2B	603	7.5	AWG 10	825	*	1.0725	0.0301
AF RHR EMERG AHU 2B	603	7.5	AWG 14	97	*	0.3182	0.0041
AF DG RM HVAC SPLY FAN 2	600	50	1/O	863	*	0.1105	0.0252
DG STARTING AIR COMP 1A	618	5	AWG 14	312	*	1.0234	0.0130
DG STARTING AIR COMP 1B	616	5	AWG 14	317	*	1.0398	0.0133
DG 1 CLG WTR PUMP CLR FAN B	627	1.5	AWG 14	453	C326A	1.7798	0.0189
DG 1 CLG WTR PUMP CLR FAN A	626	1.5	AWG 14	455	C301A	1.8474	0.0190
RHRS WTR PMP 1D CLR FAN A	628	3	AWG 10	373	C526A	0.5499	0.0136
RHRS WTR PMP 1D CLR FAN B	629	3	AWG 10	368	C526A	0.5434	0.0134
RHRS WTR PMP 1D CLR FAN C	630	3	AWG 10	370	C526A	0.5460	0.0135
RHRS WTR PMP 1D CLR FAN D	631	3	AWG 10	374	C526A	0.5512	0.0137
RHRS WTR PMP 1C CLR FAN A	622	3	AWG 10	407	C526A	0.5941	0.0149
RHRS WTR PMP 1C CLR FAN B	623	3	AWG 10	403	C526A	0.5889	0.0147
RHRS WTR PMP 1C CLR FAN C	624	3	AWG 10	403	C526A	0.5889	0.0147
RHRS WTR PMP 1C CLR FAN D	625	3	AWG 10	407	C526A	0.5941	0.0149
250 V BATTERY CHARGER #1	617	94kVA	250 MCM	238	*	0.0129	0.0065
125 V BATTERY CHARGER #1	619	39.9kVA	AWG 2	126	*	0.0256	0.0039
RX BLDG VENT TO STDGY GAS	646	1	AWG 14	196	C239A	1.1609	0.0082
SBGT INLET DAMPER 1/2B	649	0.7	AWG 14	192	C184A	1.5448	0.0080
SBGT DISCHARGE DAMPER	648	2.7	AWG 14	243	C184A	1.7120	0.0102
SBGT OUTSIDE AIR SPLY DMPR	647	0.1	AWG 14	171	C036A	0.5609	0.0071
ACAD AIR COMPRESSOR	644	25	AWG 2	131	*	0.0266	0.0040
SBGT FAN	643	20	AWG 10	256	*	0.3328	0.0093
SBGT AIR HEATER	642	30 KW	AWG 6	323	*	0.1657	0.0110
CONT RM RTRN AIR FAN 1/2	662	30	AWG 2	808	*	0.1640	0.0247

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X. CALCULATION (Continued)

7. Computer Runs for Case A

The purpose of Case A is to determine the running voltage at the terminals of the safety related 480 V system loads in Division II under the worst operating condition among the four defined in the CECO Load Table.

Computer Runs for Case A include the following considerations.

- a. From the ELM-AC running voltage summary, it is found that condition 4 is the worst loading scenario that requires the highest 4.16 KV bus voltage. Therefore, condition 4 is being considered in Case A.
- b. The existing (Version 2.1 and 2.2) ELMS-AC program performs starting and voltage drop calculations assuming that all loads are constant KVA loads. Since the majority of the loads in a power plant are motors which have a constant KVA characteristic, this is a reasonable assumption. However, this approach is conservative for those loads which have a constant current or constant impedance characteristic running at below the load rated voltage.

In order to eliminate this conservatism, the resistive 'R' type loads are manually reduced in KVA or KW rating for use in Version 2.2 of ELMS-AC, where they are being treated as constant KVA loads.

The 125 V and 250 V battery chargers are manually adjusted in KVA value in order to represent their constant current characteristics. The adjustments use the following formula:

$$KVA_{new} = KVA_{running} \cdot \left(\frac{V_{MCC}}{V_{rated}} \right)$$

where V_{MCC} is the actual MCC running voltage.
 $KVA_{running}$ is the brake KVA before adjustment.

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X. CALCULATION (Continued)

The rest of the 'R' type loads are manually adjusted in KVA or KW value to represent their constant impedance characteristics. The adjustments use the following formula:

$$KVA_{new} = KVA_{running} \cdot \left(\frac{V_{MCC}}{V_{rated}} \right)^2$$

The running KVA before adjustment is determined by using the value in the base file for these 'R' type loads. The adjusted 'R' type load values are tabulated in Table 3. It should be noted that feed cable impedance to all the 'R' type loads are neglected in the KVA adjustments, which is being conservative. The adjustment is based on Condition 4 running voltages and the adjusted values are entered into all conditions where the 'R' type loads are ON. However, the adjusted value should only be considered valid for condition 4 voltages.

- c. The output voltage of the battery chargers will drop when less than 90 % of rated input voltage is available. This will result in a "Battery Low Voltage" alarm before the battery discharges to a point where there is insufficient energy available from the battery to supply the load profile. Therefore, the terminal voltages at the battery chargers are not to be evaluated by the running voltage criteria (Reference V.A).

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X. CALCULATION (Continued)

Table 3. Adjustments of 'R' Type Loads for Case A

Load Name	ELMS-Load No.	Run-ning KVA	Load Rated Volts	SWGR /MCC No	MCC Volt.	New KVA
RX Bldg Lighting 1B	584	72	480	19	440.6	60.7
120/208V Xfmr Feed 19-1-1	592	5	480	19-1	436.9	4.1
250 V Battery Charger#1	617	94	480	19-2	435.8	85.3
125 V Battery Charger#1	619	39.9	480	19-2	435.8	36.2
SBGT Air Heaters	642	30	480	19-4	438.6	25.0

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X. CALCULATION (Continued)

8. Computer Runs for Case B

The purpose of this case is to determine whether the starting continuous duty motors have adequate terminal voltage when block starting a group of motors that are marked 'Start' at LOCA Time Zero condition or RHRS SW Initiation condition given in CECO's Load Table. The bus voltage at 14-1 is to be kept at 3845 V.

The computer runs for Case B include the following considerations.

a. At LOCA Time Zero condition (Condition 1), the block starting motors include:

1. DG COOLING WATER PUMP 1 (@ SWGR 19)
2. RX WTR CLNUP SYS BOILER ISOL VLV (@ MCC 19-1)
3. DG1 CLG WTR PMP COOLER FAN A (@ MCC 19-2)
4. DG1 CLG WTR PMP COOLER FAN B (@ MCC 19-2)
5. STANDBY GAS TREATMENT FAN (@ MCC 19-4)
6. SBTG OUTSIDE AIR SUPPLY DAMPER (@ MCC 19-4)
7. SBTG SYS FAN DISCH DAMPER (@ MCC 19-4)
8. SBTG SYS INLET DAMPERS (@ MCC 18/19-5)
9. RHRS INBOARD SHUTOFF VLV 1A (@ MCC 18/19-5)
10. RX WTR RECIRC LOOP EQUAL VLV 1B (@ MCC 18/19-5)
11. RX WTR RECIRC PMP DISCH VLV 1B (@ MCC 18/19-5)

b. At RHR SW Initiation condition (Condition 2), the block starting motors include:

1. RHR SW Pump 1C Cooler Fan A (@ MCC 19-2)
2. RHR SW Pump 1C Cooler Fan B (@ MCC 19-2)
3. RHR SW Pump 1C Cooler Fan C (@ MCC 19-2)
4. RHR SW Pump 1C Cooler Fan D (@ MCC 19-2)
5. RHR SW Pump 1D Cooler Fan A (@ MCC 19-2)
6. RHR SW Pump 1D Cooler Fan B (@ MCC 19-2)
7. RHR SW Pump 1D Cooler Fan C (@ MCC 19-2)
8. RHR SW Pump 1D Cooler Fan D (@ MCC 19-2)
9. RHRS CONT SPRY SHTOF ISOL VLV (@ MCC 19-4)
10. RHRS BACKUP CONT SPRY VLV (@ MCC 19-4)
11. RHRS SPRN CHAMBER DMPLN VLV (@ MCC 19-4)
12. RHR MN SHUTOFF SUPPLY VLV 1B (@ MCC 19-4)

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X. CALCULATION (Continued)

Among the first eight identical motors, due to the feed cable length, the RHR SW Pump 1C Cooler Fan A has the worst starting voltage and therefore is evaluated.

- c. The 'R' type loads are adjusted in the same way as in Case A, and the adjusted load values for Case B are tabulated in Table 4. The adjusted loading is entered to the corresponding load in each starting case ELMS-AC data file for the starting load condition only.

Table 4 Adjustment of 'R' type Loads for Case B

Load Name	ELMS-Load No.	Run-ning KVA	Load Rated Volts	SWGR /MCC No	Condition 1		Condition 2	
					MCC V	KVA	MCC V	KVA
Rx Bldg Lighting 1B	584	72	480	19	418.4	54.7	434.6	59.0
120/208V Xfmr Feed 19-1-1	592	5	480	19-1	417.9	3.8	431.0	4.0
250 V Battery Charger#1	617	94	480	19-2	413.9	81.1	427.4	83.7
125 V Battery Charger#1	619	39.9	480	19-2	413.9	34.4	427.4	35.5
SBGT Air Heaters	642	30	480	19-4	412.5	22.2	430.5	24.1

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XI. COMPARISON OF CALCULATED RESULTS WITH ACCEPTANCE CRITERIA

1. Case A computer printouts are included in Appendix A. The results are summarized in Table 5.

Table 5. Summary of Running Voltage Run - Case A

Load/Bus Name	Rated Voltage (V)	Motor/Bus Running (V)	Minimum Acceptable Voltage (V)	Feed MCC	MCC Voltage (V)
Bus 14-1	4160	3845.0	--	--	--
DG OIL TRANSFER PUMP 1	460	420.4	414.0	19-1	436.9
RHRS EMERG. AHU 1B	460	422.1	414.0	19-1	436.9
DG STG AIR COMP. 1B	460	424.2	414.0	19-2	435.8
DG STG AIR COMP. 1A	460	424.4	414.0	19-2	435.8
HPCI EMERG. AHU	460	425.1	414.0	19-1	436.9

It is noted that all safety related loads have running voltage above the acceptance criteria of 90% of 460 V.

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XI COMPARISON OF CALCULATED RESULTS WITH ACCEPTANCE CRITERIA (continued)

2. Case B computer printouts are included in Appendix B. The results are summarized in Table 6.

Table 6. Summary of Starting Voltage Runs - Case B
(3845.0 V at Switchgear 14-1)

Limiting Motor Load Name	Starting Condition	MCC Voltage (MCC No)	Starting Voltage	
			Terminal	Accept. V
DG Cooling Water Pump 1	LOCA Time Zero	418.4 (19)	385.6 V (83.8%)	322 (70%)
SBGT Fan	LOCA Time Zero	412.5 (19-4)	371.9 V (80.8%)	345 (75%)
DG1 Clg Wtr Pmp Clr Fan A	LOCA Time Zero	413.9 (19-2)	381.0 V (82.8%)	345 (75%)
RHRS SW Pump 1C Clr Fan A	RHR SW Initiation	427.4 (19-2)	410.5 V (89.2%)	391 (85%)

It should be noted that at both conditions (LOCA time zero and RHR SW initiation), all starting continuous duty motors meet their respective acceptance criteria.

SARGENT & LUNDY
ENGINEERS

Calc. For Quad Cities 1/11 Safety-related Continuous	
Load Running/Starting Voltages	
X	Safety-Related
	Non-Safety-Related

Calc. No. 8913-69-19-1	
Rev. 0	Date
Page 27	of 27

Client	Commonwealth Edison Company
Project	Quad Cities Unit 1
Proj. No.	8913-69 Equip. No.

Prepared by	Date
Reviewed by	Date
Approved by	Date

XII. CONCLUSIONS

This calculation evaluates the motor terminal voltage during starting and running, with 3845 Volts at the 4.16 KV Switchgear 14-1, for the safety related 480 V system loads in Quad Cities Unit 1, Division II for the LOCA loading conditions defined by CECO.

The calculation indicates that, with the identified assumptions in this calculation, all starting motors as identified in the CECO Load Table for Condition 1 and 2 meet their respective acceptance criteria, and all of the safety-related loads meet the 90% running voltage criteria.

XIII. RECOMMENDATIONS

Not applicable due to the scope of this calculation.

185290

SARGENT & LUNDY
ENGINEERS

Calc. For Quad Cities 1/11 Safety-related Continuous

Load Running/Starting Voltages

X

Safety-Related

Non-Safety-Related

Client Commonwealth Edison Company

Project Quad Cities Unit 1

Proj. No. 8913-69

Equip. No.

Prepared by

Date

Reviewed by

Date

Approved by

Date

APPENDIX A

CASE A COMPUTER PRINTOUTS

(RUNNING VOLTAGE EVALUATION)

SARGENT & LUNDY
ENGINEERS

Calc. For Quad Cities 1/11 Safety-related Continuous

Load Running/Starting Voltages

X

Safety-Related

Non-Safety-Related

Client	Commonwealth Edison Company
Project	Quad Cities Unit 1
Proj. No.	8913-69
Equip. No.	

Prepared by	Date
Reviewed by	Date
Approved by	Date

Listed in the following order:

File: Z1.DAT

Bus Data,
Connection Data,
Load Data;
Running Voltage Summary;
Load Summary by Bus.

Note: In the base ELMS-AC file: Q1A4.M05, there are four Equipment Number - Load Name mismatches. In this calculation, the equipment number is used as the key to relate loads as appearing in CECO Load Table and the ELMS-AC file. In the future revision of file Q1A4.M05, the mismatched Load Names will be corrected (Reference V.Z). These four loads are:

<u>Equipment Number</u>	<u>ELMS LOAD No</u>	<u>Mismatched Load Name</u>	<u>Correct Load Name</u>
1-202-9A	668	RX WTR RECIRC LOOP EQUAL VLV	RX WTR RECIRC LP EQ BYPASS VLV
1-202-6B	669	RX WTR RECIRC PMP SUCTION	RX WTR RECIRC LP EQ VALVE 1B
1-202-4B	670	RX WTR RECIRC PMP DISCH VLV	RX WTR RECIRC PMP SUCTION VLV
1-202-9B	674	RX WTR RECIRC LP EQUAL VLV	RX WTR RECIRC LP EQ BYPASS VLV

AC Electrical Load Monitoring System Ver 2.20

Date : 04-27-92

Sargent & Lundy Engineers

Chicago, Ill.

Utility : Sargent & Lundy Internal Use

Proj. No. : 8913-94

Station : QUAD CITIES-FILE:Z1.DAT

Unit : 1

*** Bus Data ***

Rec #	Bus Name	Bus Voltage	Class 1E	SC Amps	Valid Sources	Swgr MVA	Maximum Volts	K Fact	Inter. Trip Cycles Del	Source Data		
										Min Run Volts	Max SC MVA	SC Profit X/R V (PU)
23	HIGH SIDE OF XFMR 16	4160.0	N	29000.	1 2	250.	4760.0	1.24	5 Sym	.0		
24	480V SWGR 16	480.0	N	22000.	1 2							
25	HIGH SIDE OF XFMR 17	4160.0	N	29000.	1 2	250.	4760.0	1.24	5 Sym	.0		
26	480V SWGR 17	480.0	N	22000.	1 2							
27	HIGH SIDE OF XFMR 18	4160.0	Y	29000.	1 2	250.	4760.0	1.24	5 Sym	.0		
28	480V SWGR 18	480.0	Y	22000.	1 2							
29	HIGH SIDE OF XFMR 19	4160.0	Y	29000.	3	250.	4760.0	1.24	5 Sym	.0		
30	480V SWGR 19	480.0	Y	22000.	3							
31	HIGH SIDE OF XFMR 1A	4160.0	N	29000.	1 2	250.	4760.0	1.24	5 Sym	.0		
32	480V MCC 1A-1	480.0	N	25000.	1 2							
33	HIGH SIDE OF XFMR 31	4160.0	N	29000.	1 2	250.	4760.0	1.24	5 Sym	.0		
34	480V MCC 30	480.0	N	22000.	1 2							
35	480V MCC 15-1	480.0	N	14000.	1 2							
36	480V MCC 15-2	480.0	N	14000.	1 2							
37	480V MCC 15-3	480.0	N	14000.	1 2							
38	480V MCC 15-4	480.0	N	14000.	1 2							
39	480V MCC 15-5	480.0	N	14000.	1 2							
40	480V HRSS BLDG MCC	480.0	N	14000.	1 2							
41	480V WAREHOUSE DISTR	480.0	N	18000.	1 2							
42	480V MCC 16/26-1	480.0	N	14000.	1 2							
43	480V MCC 16-2	480.0	N	14000.	1 2							
44	480V MCC 16-3	480.0	N	14000.	1 2							

AC Electrical Load Monitoring System Ver 2.20

Sargent & Lundy Engineers

Chicago, Ill.

Proj. No. : 8913-94

Unit : 1

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*** Bus Data ***
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***** Source Data *****
```

[illegible]

Sargent & Lundy Engineers
Chicago, Ill.

Proj. No. : B913-94
Unit : 1

Bus Data

```
***** Source Data *****
```

Rec #	Bus Name	Bus Voltage	Class 1E	SC Amps	Valid Sources	Swgr MVA	Maximum Volts	K	Inter. Trip	Min Run	Max SC	SC Prefit
89	CORE SPRY AIR 1B TER	480.0	N	20.	3							
90	HPCI TANK HTR TERM	480.0	N	20.	3							
91	DG OIL XFER PMP 2 TE	480.0	N	20.	3							
92	RHR EMER AIR 2B TERM	480.0	N	20.	3							
93	DG RM HVAC FAN 2 TER	480.0	N	20.	3							
94	DG STG COMP 1A TERM	480.0	N	20.	3							
95	DG STG COMP 1B TERM	480.0	N	20.	3							
96	DG 1 CLR FAN A TERM	480.0	N	20.	3							
97	DG 1 CLR FAN B TERM	480.0	N	20.	3							
98	RHR PMP 1C FAN A TER	480.0	N	20.	3							
99	250 V BTRY CHGR TERM	480.0	N	20.	3							
100	125 V BTRY CHGR TERM	480.0	N	20.	3							
101	RX VENT TO SBTG TERM	480.0	N	20.	3							
102	SBGT INLET DAMPER TE	480.0	N	20.	3							
103	SBGT DISCH DAMPER TE	480.0	N	20.	3							
104	SBGT OUT DAMPER TERM	480.0	N	20.	3							
105	ACAD AIR COMP TERM	480.0	N	20.	3							
106	SBGT FAN TERM	480.0	N	20.	3							
107	SBGT AIR HTR TERM	480.0	N	20.	3							
108	CONT RM RTN FAN TERM	480.0	N	20.	3							

AC Electrical Load Monitoring System Ver 2.20

Date : 04-27-92

Sargent & Lundy Engineers

Chicago, Ill.

Utility : Sargent & Lundy Internal Use

Proj. No. : 8913-94

Station : QUAD CITIES-FILE:Z1.DAT

Unit : 1

*** Connection Data ***

From	To	Rating	Cable R (ohms)	X (ohms)	% Imp OA Base	% Imp Tol	OA kVA	X/R Ratio	Tap Ratio
GENERATOR 1	UAT 11/INTERNAL BUS	1553.0 Amps	.0020369	.0407380					
UAT 11 INTERNAL BUS	X WINDG IMAGINRY BUS	19000.0 kVA			16.336	00.0	27600.0	20.0	.950
UAT 11 INTERNAL BUS	Y WINDG IMAGINRY BUS	27000.0 kVA			12.352	00.0	27600.0	20.0	.950
Y WINDG IMAGINRY BUS 4KV SWGR 12		4000.0 Amps	.0010000	.0000000					
Y WINDG IMAGINRY BUS 4KV SWGR 11		4000.0 Amps	.0010000	.0005220					
X WINDG IMAGINRY BUS 4KV SWGR 13		3000.0 Amps	.0010000	.0007938					
X WINDG IMAGINRY BUS 4KV SWGR 14		3000.0 Amps	.0010000	.0000000					
345KV SWITCH YARD	180KV DUMMY BUS	46000.0 kVA			-1.250	00.0	27600.0	25.0	.975
180KV DUMMY BUS	X WINDING BUS 6	19000.0 kVA			16.750	00.0	27600.0	25.0	.975
180KV DUMMY BUS	Y WINDING BUS 8	27000.0 kVA			13.650	00.0	27600.0	25.0	.975
X WINDING BUS 6	4KV SWGR 13	3000.0 Amps	.0010000	.0007938					
X WINDING BUS 6	4KV SWGR 14	3000.0 Amps	.0010000	.0000000					
Y WINDING BUS 8	4KV SWGR 11	4000.0 Amps	.0010000	.0005220					
Y WINDING BUS 8	4KV SWGR 12	4000.0 Amps	.0010000	.0000000					
4KV SWGR 13	4KV SWGR 13-1	680.0 Amps	.0045792	.0096672					
4KV SWGR 13-1	DIESEL GENERATOR 1/2	600.0 Amps	.0087500	.0155000					

AC Electrical Load Monitoring System Ver 2.20

Sargent & Lundy Engineers

Chicago, Ill.

Date : 04-27-92

Utility : Sargent & Lundy Internal Use

Station : QUAD CITIES-FILE:21.DAT

Proj. No. : 8913-94

Unit : 1

*** Connection Data ***

From	To	Rating	Cable R (ohms)	X (ohms)	% Imp OA Base	% Imp Tol	OA kVA	X/R Ratio	Tap Ratio
EQUIVELANT SOURCE 3	4KV SWGR 14-1	250.0 Amps	.0000000	.0010000					
4KV SWGR 14	4KV SWGR 14-1	680.0 Amps	.0044496	.0093936					
4KV SWGR 14-1	DIESEL GENERATOR 1	600.0 Amps	.0085750	.0151900					
4KV SWGR 14-1	4KV SWGR 31	115.0 Amps	.0768000	.0230400					
4KV SWGR 31	HIGH SIDE OF XFMR 31	83.0 Amps	.0081200	.0016960					
4KV SWGR 14-1	HIGH SIDE OF XFMR 19	390.0 Amps	.0064625	.0075435					
4KV SWGR 13-1	HIGH SIDE OF XFMR 18	390.0 Amps	.0028600	.0033384					
4KV SWGR 13	HIGH SIDE OF XFMR 15	390.0 Amps	.0045925	.0053607					
4KV SWGR 13-1	HIGH SIDE OF XFMR 10	220.0 Amps	.0624303	.0349766					
4KV SWGR 14	HIGH SIDE OF XFMR 16	390.0 Amps	.0044825	.0052323					
4KV SWGR 14	HIGH SIDE OF XFMR 17	390.0 Amps	.0151800	.0177192					
4KV SWGR 13	HIGH SIDE OF XFMR 1A	230.0 Amps	.0479250	.0268500					
HIGH SIDE OF XFMR 31	480V MCC 30	225.0 kVA			4.000	00.0	225.0	1.6	.975
HIGH SIDE OF XFMR 18	480V SWGR 18	1680.0 kVA			12.020	00.0	1500.0	8.9	.975
HIGH SIDE OF XFMR 19	480V SWGR 19	1680.0 kVA			11.430	00.0	1500.0	8.5	.975
HIGH SIDE OF XFMR 10	480V MCC 10-1	500.0 kVA			4.700	00.0	500.0	3.8	.975

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AC Electrical Load Monitoring System Ver 2.20

Sargent & Lundy Engineers

Chicago, Ill.

Date : 04-27-92

Utility : Sargent & Lundy Internal Use
 Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-94

Unit : 1

*** Connection Data ***

From	To	Rating	Cable R (ohms)	X (ohms)	% Imp OA Base	% Imp Tol	OA kVA	X/R Ratio	Tap Ratio
HIGH SIDE OF XFMR 1A 480V MCC 1A-1		750.0 kVA			5.560	00.0	750.0	3.3	.975
HIGH SIDE OF XFMR 17 480V SWGR 17		1680.0 kVA			11.110	00.0	1500.0	8.2	.975
HIGH SIDE OF XFMR 16 480V SWGR 16		1680.0 kVA			11.340	00.0	1500.0	8.4	.975
HIGH SIDE OF XFMR 15 480V SWGR 15		1680.0 kVA			11.300	00.0	1500.0	8.4	.975
480V SWGR 15	480V MCC 15-1	198.0 Amps	.0060784	.0031668					
480V SWGR 15	480V MCC 15-2	220.0 Amps	.0124188	.0064701					
480V SWGR 15	480V MCC 15-3	280.0 Amps	.0136928	.0093632					
480V SWGR 15	480V MCC 15-4	280.0 Amps	.0136928	.0093632					
480V SWGR 15	480V MCC 15-5	220.0 Amps	.0180780	.0094185					
480V SWGR 15	480V HRSS BLDG MCC	190.0 Amps	.0351450	.0150700					
480V SWGR 15	480V WAREHOUSE DISTR	220.0 Amps	.0063404	.0033033					
480V SWGR 16	480V MCC 16/26-1	220.0 Amps	.0133096	.0069342					
480V SWGR 16	480V MCC 16-2	220.0 Amps	.0399812	.0208299					
480V SWGR 16	480V MCC 16-3	220.0 Amps	.0072224	.0048048					
480V SWGR 16	480V MCC 16/26-4	220.0 Amps	.0233704	.0121758					
480V SWGR 16	480V MCC 16/26-5	220.0 Amps	.0215888	.0112476					

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AC Electrical Load Monitoring System Ver 2.20

Date : 04-27-92

Sargent & Lundy Engineers
Chicago, Ill.Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DATProj. No. : 8913-94
Unit : 1

*** Connection Data ***

From	To	Rating	Cable R (ohms)	X (ohms)	% Imp OA Base	% Imp Tol	OA kVA	X/R Ratio	Tap Ratio
480V SWGR 16	480V MCC 16/26-6	220.0 Amps	.0178684	.0093093					
480V SWGR 16	480V MCC 16-7	280.0 Amps	.0145875	.0099750					
480V SWGR 16	480V MCC 16-8	280.0 Amps	.0145875	.0099750					
480V SWGR 17	480V MCC 17-1	220.0 Amps	.0138336	.0072072					
480V SWGR 17	480V MCC 17-2	220.0 Amps	.0186020	.0096915					
480V SWGR 17	480V MCC 17/27-3	220.0 Amps	.0160868	.0083811					
480V SWGR 17	480V MCC 17/27-4	220.0 Amps	.0169776	.0088452					
480V SWGR 17	480V MCC 17-5	280.0 Amps	.0292139	.0199766					
480V SWGR 17	480V MCC 17-6	220.0 Amps	.0160868	.0083811					
480V SWGR 18	480V MCC 18-1A	220.0 Amps	.0161392	.0084084					
480V SWGR 18	480V MCC 18-1B	220.0 Amps	.0161392	.0084084					
480V SWGR 18	480V MCC 18-2	220.0 Amps	.0164536	.0085722					
480V SWGR 18	480V MCC 18-3	400.0 Amps	.0123750	.0116550					
480V SWGR 18	480V MCC 18-4	400.0 Amps	.0206250	.0194250					
480V SWGR 19	480V MCC 19-1	220.0 Amps	.0188074	.0094731					
480V SWGR 19	480V MCC 19-2	220.0 Amps	.0084552	.0042588					

AC Electrical Load Monitoring System Ver 2.20

Date : 04-27-92

Sargent & Lundy Engineers

Chicago, Ill.

Utility : Sargent & Lundy Internal Use
 Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-94
 Unit : 1

*** Connection Data ***

From	To	Rating	Cable R (ohms)	X (ohms)	% Imp OA Base	% Imp Tol	OA kVA	X/R Ratio	Tap Ratio
480V SWGR 19	480V MCC 19-3	220.0 Amps	.0212464	.0107016					
480V SWGR 19	480V MCC 19-4	220.0 Amps	.0178860	.0090090					
480V SWGR 19	480V MCC 18/19-5	220.0 Amps	.0175608	.0088452					
480V SWGR 19	480V MCC 19-6	280.0 Amps	.0136150	.0093100					
4KV SWGR 14-1	4KV SWGR 24-1	800.0 Amps	.0014626	.0098974					
4KV SWGR 24-1	4KV SWGR 24	680.0 Amps	.0085680	.0180880					
4KV SWGR 24-1	DIESEL GENERATOR 2	600.0 Amps	.0103250	.0182900					
4KV SWGR 24-1	HIGH SIDE OF XFMR 29	390.0 Amps	.0021450	.0025038					
HIGH SIDE OF XFMR 29	480V SWGR 29	1680.0 kVA			11.300	00.0	1500.0	8.4	.975
480V SWGR 29	480V MCC 29-1	220.0 Amps	.0136764	.0071253					
480V SWGR 29	480V MCC 29-2	220.0 Amps	.0151436	.0078897					
480V SWGR 29	480V MCC 29-3	220.0 Amps	.0150388	.0078351					
480V SWGR 29	480V MCC 29-4	220.0 Amps	.0131000	.0068250					
480V SWGR 29	480V MCC 28/29-5	220.0 Amps	.0149864	.0078078					
480V SWGR 29	480V MCC 29-6	280.0 Amps	.0126425	.0086450					
HIGH SIDE GATEHOUSE	480V GATEHOUSE MCC	1000.0 kVA			5.440	00.0	750.0	5.0	.975

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AC Electrical Load Monitoring System Ver 2.20

Date : 04-27-92

Sargent & Lundy Engineers

Chicago, Ill.

Utility : Sargent & Lundy Internal Use

Proj. No. : B913-94

Station : QUAD CITIES-FILE:Z1.DAT

Unit : 1

*** Connection Data ***

From	To	Rating	Cable R (ohms)	X (ohms)	% Imp OA Base	% Imp Tol	X/R Ratio	Tap Ratio
4KV SWGR 14-1	HIGH SIDE GATEHOUSE	220.0 Amps	.0345699	.0193678				
480V GATEHOUSE MCC	480V DIESEL BLDG MCC	400.0 Amps	.0027500	.0051800				
480V SWGR 19	DG CLG WTR PUMP TERM	400.0 Amps	.0450000	.0193000				
480V MCC 19-1	HPCI AIR UNIT TERM	400.0 Amps	1.7706000	.0217000				
480V MCC 19-1	HPCI CLG SEAL PMP TE	400.0 Amps	.2385000	.0159000				
480V MCC 19-1	RHRS AIR HDLG 1B TER	400.0 Amps	.8790000	.0112000				
480V MCC 19-1	POST LOCA H2/O2 TERM	400.0 Amps	1.0030000	.0106000				
480V MCC 19-1	STBY LQD PMP TERM	400.0 Amps	.0869000	.0131000				
480V MCC 19-1	DG OIL XFER PMP TERM	400.0 Amps	2.7190000	.0237000				
480V MCC 19-1	DG RM HVAC FAN TERM	400.0 Amps	.0714000	.0163000				
480V MCC 19-1	CORE SPRY AIR 1B TER	400.0 Amps	.9774000	.0125000				
480V MCC 19-1	HPCI TANK HTR TERM	400.0 Amps	.5432000	.0166000				
480V MCC 19-1	DG OIL XFER PMP 2 TE	400.0 Amps	3.2357000	.0358000				
480V MCC 19-1	RHR EMER AIR 2B TERM	400.0 Amps	1.3906600	.0341670				
480V MCC 19-1	DG RM HVAC FAN 2 TER	400.0 Amps	.1105000	.0252000				
480V MCC 19-2	DG STG COMP 1A TERM	400.0 Amps	1.0234000	.0130000				

Date :

Sargent & Lundy Engineers
Chicago, Ill.Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:21.DATProj. No. : B913-94
Unit : 1

*** Connection Data ***

From	To	Rating	Cable R (ohms)	X (ohms)	% Imp OA Base Tol	% Imp Tol	X/R OA kVA Ratio	Tap Ratio
480V MCC 19-2	DG STG COMP 1B TERM	400.0 Amps	1.0398000	.0133000				
480V MCC 19-2	DG 1 CLR FAN A TERM	400.0 Amps	1.8474000	.0190000				
480V MCC 19-2	DG 1 CLR FAN B TERM	400.0 Amps	1.7798000	.0189000				
480V MCC 19-2	RHR PMP 1C FAN A TER	400.0 Amps	.5941000	.0149000				
480V MCC 19-2	250 V BTRY CHGR TERM	400.0 Amps	.0129000	.0065000				
480V MCC 19-2	125 V BTRY CHGR TERM	400.0 Amps	.0256000	.0039000				
480V MCC 19-4	RX VENT TO SGBT TERM	400.0 Amps	1.1609000	.0082000				
480V MCC 19-4	SBGT INLET DAMPER TE	400.0 Amps	1.5448000	.0080000				
480V MCC 19-4	SBGT DISCH DAMPER TE	400.0 Amps	1.7120000	.0102000				
480V MCC 19-4	SBGT OUT DAMPER TERM	400.0 Amps	.5608800	.0071000				
480V MCC 19-4	ACAD AIR COMP TERM	400.0 Amps	.0266000	.0040000				
480V MCC 19-4	SBGT FAN TERM	400.0 Amps	.3328000	.0093000				
480V MCC 19-4	SBGT AIR HTR TERM	400.0 Amps	.1657000	.0110000				
480V MCC 18/19-5	CONT RM RTN FAN TERM	400.0 Amps	.1640000	.0247000				

Date :

Sargent & Lundy Engineers
Chicago, Ill.Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DATProj. No. : B913-94
Unit : 1

*** Load Data ***

Rec # 575 1/2-9400-100 COMTL RM STNDBY AHU Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 18-4	460	50.0 HP	I	90.0	85.0	625	38.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 576 120/208 XFMR Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 18-4	480	15.0KVA	R	100.0	75.0	0	20.0	0	.0000		
Running Load : Condition 1: 15.0 KVA 2: 15.0 KVA 3: 15.0 KVA 4: 15.0 KVA											

Rec # 577 1/2-9400-101 CONT RM AFU HTR Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 18-4	480	9.0 KW	R	100.0	100.0	0	20.0	0	.0000		
Running Load : Condition 1: 9.0 KW 2: 9.0 KW 3: 9.0 KW 4: 9.0 KW											

Rec # 578 1-1902B FUEL POOL CLG WTR PMP 1B Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V SWGR 19	460	100.0 HP	I	90.0	85.0	625	37.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 579 1-3701B RX BLDG CLG WTR PMP 1B Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V SWGR 19	460	125.0 HP	I	90.0	85.0	625	35.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 580 1-5704B RX BLDG EXH FAN 1B Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V SWGR 19	460	100.0 HP	I	90.0	85.0	625	37.0	1775	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 581 1-5704C RX BLDG EXH FAN 1C Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V SWGR 19	460	100.0 HP	I	90.0	85.0	625	37.0	1775	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

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Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DATProj. No. : 8913-94
Unit : 1

*** Load Data ***

Rec # 582 1-5703A RX BLDG SPLY FAN 1A Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable
480V SWGR 19	460.	100.0 HP	1	90.0	85.0	625.	37.0	1800	.0000
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP									

Rec # 583 1-5705C TURB BLDG EXH FAN 1C Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable
480V SWGR 19	460.	150.0 HP	1	90.0	85.0	625.	33.0	1780	.0000
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP									

Rec # 584 RX BLDG LTGING 1B Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable
480V SWGR 19	480.	72.0KVA	R	100.0	90.0	0.	20.0	0	.0000
Running Load : Condition 1: 60.7 KVA 2: 60.7 KVA 3: 60.7 KVA 4: 60.7 KVA									

Rec # 585 1-5702B E. TURB BLDG SPLY FAN 1B Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable
480V SWGR 19	460.	100.0 HP	1	90.0	85.0	625.	37.0	1800	.0000
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP									

Rec # 586 1-3903 DG CLG WTR PMP #1 Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable
DG CLG WTR PUMP TERM	460	100.0 HP	1	88.5	91.2	541.	37.0	3525	.0000
Running Load : Condition 1: 90.0 HP 2: 90.0 HP 3: 90.0 HP 4: 90.0 HP									

Rec # 587 1/2-7701C RX BLDG CLG PMP 1/2C Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable
BDV SWGR 19	460.	125.0 HP	1	90.0	85.0	625.	35.0	1800	.0000
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP									

Rec # 588 1-5727 HVAC SPLY FAN#1 NORMAL FEED Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable
IRM HVAC FAN TERM	460.	50.0 HP	1	90.0	85.0	625.	38.0	1800	.0000
Running Load : Condition 1: .0 HP 2: 50.0 HP 3: 50.0 HP 4: 50.0 HP									

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Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DATProj. No. : 8913-94
Unit : 1

*** Load Data ***

Rec # 589 1-5748B CORESPRAY EMERG AHU 1B Status : E *** Safety - Related ***
 Rated Eff PF LRC St pf SC TC Modification # / Cable
 Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys
 CORE SPRY AIR 1B TER 460. 5.0 HP 1 80.0 85.0 625. 58.0 1740 .0000
 Running Load : Condition 1: .0 HP 2: 5.0 HP 3: 5.0 HP 4: 5.0 HP

Rec # 590 5203-1 ALT FD DG#2 FUEL OIL XFRPMP Status : E *** Safety - Related ***
 Rated Eff PF LRC St pf SC TC Modification # / Cable
 Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys
 DG OIL XFER PMP 2 TE 460. 3.0 HP 1 80.0 85.0 625. 68.0 1755 .0000
 Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP

Rec # 591 5203-1 DG FUEL OIL XFER PMP #1 Status : E *** Safety - Related ***
 Rated Eff PF LRC St pf SC TC Modification # / Cable
 Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys
 DG OIL XFER PMP TERM 460. 3.0 HP 1 80.0 85.0 625. 68.0 1755 .0000
 Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: 2.7 HP

Rec # 592 120/208V XFMR FD 19-1-1 Status : E *** Safety - Related ***
 Rated Eff PF LRC St pf SC TC Modification # / Cable
 Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys
 480V MCC 19-1 480. 15.0KVA R 100.0 75.0 0. 20.0 0 .0000
 Running Load : Condition 1: 4.1 KVA 2: 4.1 KVA 3: 4.1 KVA 4: 4.1 KVA

Rec # 593 1-1102B STNDBY LQD CNTRL PMP 1B Status : E
 Rated Eff PF LRC St pf SC TC Modification # / Cable
 Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys
 STBY LQD PMP TERM 460. 50.0 HP 1 90.0 85.0 625. 38.0 1770 .0000
 Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP

Rec # 594 1-5746B RHR EMERG AHU 1B Status : E *** Safety - Related ***
 Rated Eff PF LRC St pf SC TC Modification # / Cable
 Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys
 RHR AIR HDLG 1B TER 460. 7.5 HP 1 80.0 85.0 625. 56.0 1800 .0000
 Running Load : Condition 1: .0 HP 2: 7.5 HP 3: 7.5 HP 4: 7.5 HP

Rec # 595 1-1279-2B RX WTR CLNUP SYS FLTR HDPMP Status : E *** Safety - Related ***
 Rated Eff PF LRC St pf SC TC Modification # / Cable
 Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys
 480V MCC 19-1 460. 2.0 HP 1 80.0 85.0 625. 75.0 1800 .0000
 Running Load : Condition 1: .0 HP 2: 1.8 HP 3: 1.8 HP 4: 1.8 HP

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Utility : Sargent & Lundy Internal Use
 Station : QUAD CITIES-FILE:21.DAT

Proj. No. : 8913-94
 Unit : 1

*** Load Data ***

Rec # 596 1-5708-1B DRYWELL & TORUS PRG EXH FAN Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # /	Cable #	Sys
480V MCC 19-1	460.	30.0 HP	1	85.0	85.0	625.	42.0	1750	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 597 1-5747 HPCI EMERG AHU Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # /	Cable #	Sys
HPCI AIR UNIT TERM	460.	3.0 HP	1	80.0	85.0	625.	68.0	1755	.0000		
Running Load : Condition 1: .0 HP 2: 3.0 HP 3: 3.0 HP 4: 3.0 HP											

Rec # 598 1-1279-116 RESIN FEED TANK AGITATOR Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # /	Cable #	Sys
480V MCC 19-1	460.	.8 HP	1	75.0	80.0	625.	83.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 599 2301-57 HPCI CLG WTR GLN SL COND PMP Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # /	Cable #	Sys
HPCI CLG SEAL PMP TE	460.	25.0 HP	1	85.0	85.0	625.	43.0	3530	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 600 2-5727 ALT FD DG RM HVAC SPLY FAN2 Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # /	Cable #	Sys
DG RM HVAC FAN 2 TER	460.	50.0 HP	1	90.0	85.0	625.	38.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 601 1-12058 RX WTR CLNUP SYS RECIRC PMP Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # /	Cable #	Sys
480V MCC 19-1	460.	50.0 HP	1	90.0	85.0	625.	38.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 602 POST LOCA H2 O2 MON PMP Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # /	Cable #	Sys
POST LOCA H2/O2 TERM	460.	1.0 HP	1	75.0	80.0	625.	75.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: .9 HP 3: .9 HP 4: .9 HP											

Date :

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Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DATProj. No. : 8913-94
Unit : 1

*** Load Data ***

Rec # 603 2-5746B ALT FD RHRS EMERG AHU 2B Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	(sec) Master Diagram #	#	Sys
RHR EMER AIR 2B TERM	460.	7.5 HP	1	80.0	85.0	625.	56.0	1800	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP												

Rec # 604 1-1201-80 RX WTR CLNUP SYS BOILER VLV Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	(sec) Master Diagram #	#	Sys
480V MCC 19-1	460.	1.0 HP	1	75.0	80.0	625.	79.0	1800	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP												

Rec # 605 1-2301-4 HPCI TURB STM SUPPLY VLV Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	(sec) Master Diagram #	#	Sys
480V MCC 19-1	460.	1.0 HP	1	75.0	80.0	640.	79.0	1800	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP												

Rec # 606 1-1001-186B RHRS HX REV INLET VLV Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	(sec) Master Diagram #	#	Sys
480V MCC 19-1	460.	1.7 HP	1	75.0	80.0	325.	75.0	1800	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP												

Rec # 607 1-1402-24B CORE SPRAY OTBD ISOL VLV 1B Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	(sec) Master Diagram #	#	Sys
480V MCC 19-1	460.	4.0 HP	1	80.0	85.0	827.	58.0	1800	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP												

Rec # 608 1-1402-25B CORE SPRAY INBD ISOL VLV 1B Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	(sec) Master Diagram #	#	Sys
480V MCC 19-1	460.	8.0 HP	1	80.0	85.0	827.	54.0	1800	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP												

Rec # 609 1-1402-4B CS TEST BYPASS VLV 1B Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	(sec) Master Diagram #	#	Sys
80V MCC 19-1	460.	1.6 HP	1	75.0	80.0	256.	75.0	1800	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP												

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Date :

Sargent & Lundy Engineers

Chicago, Ill.

Utility : Sargent & Lundy Internal Use

Proj. No. : 8913-94

Station : QUAD CITIES-FILE:Z1.DAT

Unit : 1

*** Load Data ***

Rec # 610 1-1001-185B RHRS HX NORM OUTLET VLV Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 19-1	460.	1.7 HP	I	75.0	80.0	350.	75.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 611 1-1001-187B RHRS HX REVERSE OUTLET VLV Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 19-1	460.	1.6 HP	I	75.0	80.0	300.	75.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 612 HPCI TANK HEATER Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
HPCI TANK HTR TERM	480.	9.0 KW	R	100.0	100.0	0.	20.0	0	.0000		
Running Load : Condition 1: .0 KW 2: .0 KW 3: .0 KW 4: .0 KW											

Rec # 613 1-1001-4B RHRS HX NORMAL INLET VLV Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 19-1	460.	3.7 HP	I	80.0	85.0	590.	58.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 614 1-5701 RECIRC MG SET VENT FAN1A Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 19-2	460.	60.0 HP	I	90.0	85.0	625.	38.0	1200	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 615 RX PROT M-G SET 1B Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 19-2	460.	25.0 HP	I	85.0	85.0	625.	43.0	1787	.0000		
Running Load : Condition 1: 16.5 HP 2: 16.5 HP 3: 16.5 HP 4: 16.5 HP											

Rec # 616 DG STARTING AIR COMP 1B Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
DG STG COMP 1B TERM	460.	5.0 HP	I	80.0	85.0	625.	58.0	1735	.0000		
Running Load : Condition 1: .0 HP 2: 5.0 HP 3: 5.0 HP 4: 5.0 HP											

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Date :

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-94
Unit : 1

*** Load Data ***

ec # 617 250VDC BATTERY CHARGER #1 Status : E *** Safety - Related ***
Eff PF LRC St pf SC TC Modification # / Cable
Rated Volts Rating Type (%) (%) (%) Speed (sec) Master Diagram # # Sys
Source Bus 480. 94.0KVA R 100.0 95.0 0. 20.0 0 .0000
150 V BTRY CHGR TERM 480. 94.0KVA R 100.0 95.0 0. 20.0 0 .0000
Running Load : Condition 1: 85.3 KVA 2: 85.3 KVA 3: 85.3 KVA 4: 85.3 KVA

ec # 618 DG STARTING AIR COMP 1A Status : E *** Safety - Related ***
Eff PF LRC St pf SC TC Modification # / Cable
Rated Volts Rating Type (%) (%) (%) Speed (sec) Master Diagram # # Sys
Source Bus 460. 5.0 HP 1 80.0 85.0 625. 58.0 1735 .0000
G STG COMP 1A TERM 460. 5.0 HP 1 80.0 85.0 625. 58.0 1735 .0000
Running Load : Condition 1: .0 HP 2: 5.0 HP 3: 5.0 HP 4: 5.0 HP

ec # 619 125VDC BATTERY CHARGER #1 Status : E *** Safety - Related ***
Eff PF LRC St pf SC TC Modification # / Cable
Rated Volts Rating Type (%) (%) (%) Speed (sec) Master Diagram # # Sys
Source Bus 480. 39.9KVA R 100.0 95.0 0. 20.0 0 .0000
25 V BTRY CHGR TERM 480. 39.9KVA R 100.0 95.0 0. 20.0 0 .0000
Running Load : Condition 1: 36.2 KVA 2: 36.2 KVA 3: 36.2 KVA 4: 36.2 KVA

ec # 620 TURB BLDG EMERG LGTS Status : E *** Safety - Related ***
Eff PF LRC St pf SC TC Modification # / Cable
Rated Volts Rating Type (%) (%) (%) Speed (sec) Master Diagram # # Sys
Source Bus 480. 47.0 KW R 100.0 90.0 0. 20.0 0 .0000
10V MCC 19-2 480. 47.0 KW R 100.0 90.0 0. 20.0 0 .0000
Running Load : Condition 1: .0 KW 2: .0 KW 3: .0 KW 4: .0 KW

ec # 621 AF DG2 CLG WTR PMP FAN A&B Status : E *** Safety - Related ***
Eff PF LRC St pf SC TC Modification # / Cable
Rated Volts Rating Type (%) (%) (%) Speed (sec) Master Diagram # # Sys
Source Bus 460. 3.0 HP 1 75.0 80.0 625. 83.0 1800 .0000
10V MCC 19-2 460. 3.0 HP 1 75.0 80.0 625. 83.0 1800 .0000
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP

c # 622 RHR SW PMP 1C CLR FAN A Status : E *** Safety - Related ***
Eff PF LRC St pf SC TC Modification # / Cable
Rated Volts Rating Type (%) (%) (%) Speed (sec) Master Diagram # # Sys
Source Bus 460. 3.0 HP 1 80.0 85.0 625. 68.0 3600 .0000
R PMP 1C FAN A TER 460. 3.0 HP 1 80.0 85.0 625. 68.0 3600 .0000
Running Load : Condition 1: .0 HP 2: 2.7 HP 3: 2.7 HP 4: 2.7 HP

: # 623 RHR SW PMP 1C CLR FAN B Status : E *** Safety - Related ***
Eff PF LRC St pf SC TC Modification # / Cable
Rated Volts Rating Type (%) (%) (%) Speed (sec) Master Diagram # # Sys
Source Bus 460. 3.0 HP 1 80.0 85.0 625. 68.0 3600 .0000
10V MCC 19-2 460. 3.0 HP 1 80.0 85.0 625. 68.0 3600 .0000
Running Load : Condition 1: .0 HP 2: 2.7 HP 3: 2.7 HP 4: 2.7 HP

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Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DATProj. No. : 8913-94
Unit : 1

*** Load Data ***

Rec # 603 2-5746B ALT FD RHRS EMERG AHU 2B Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	Master Diagram #	#	Sys
RHR EMER AIR 2B TERM	460.	7.5 HP	1	80.0	85.0	625.	56.0	1800	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP												

Rec # 604 1-1201-80 RX WTR CLNUP SYS BOILER VLV Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	Master Diagram #	#	Sys
480V MCC 19-1	460.	1.0 HP	1	75.0	80.0	625.	79.0	1800	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP												

Rec # 605 1-2301-4 HPCI TURB STM SUPPLY VLV Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	Master Diagram #	#	Sys
480V MCC 19-1	460.	1.0 HP	1	75.0	80.0	640.	79.0	1800	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP												

Rec # 606 1-1001-186B RHRS HX REV INLET VLV Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	Master Diagram #	#	Sys
480V MCC 19-1	460.	1.7 HP	1	75.0	80.0	325.	75.0	1800	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP												

Rec # 607 1-1402-24B CORE SPRAY OTBD ISOL VLV 1B Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	Master Diagram #	#	Sys
480V MCC 19-1	460.	4.0 HP	1	80.0	85.0	827.	58.0	1800	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP												

Rec # 608 1-1402-25B CORE SPRAY INBD ISOL VLV 1B Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	Master Diagram #	#	Sys
480V MCC 19-1	460.	8.0 HP	1	80.0	85.0	827.	54.0	1800	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP												

Rec # 609 1-1402-4B CS TEST BYPASS VLV 1B Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	Master Diagram #	#	Sys
80V MCC 19-1	460.	1.6 HP	1	75.0	80.0	256.	75.0	1800	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP												

Date :

Sargent & Lundy Engineers
Chicago, Ill.Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DATProj. No. : 8913-94
Unit : 1

*** Load Data ***

Rec #	624	RHR SW PMP 1C CLR FAN C	Status : E
	Rated	Eff PF LRC St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys	
480V MCC 19-2	460	3.0 HP 1 80.0 85.0 625. 68.0 3600 .0000	
Running Load : Condition 1:		.0 HP 2: 2.7 HP 3: 2.7 HP 4: 2.7 HP	

Rec #	625	RHR SW PMP 1C CLR FAN D	Status : E
	Rated	Eff PF LRC St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys	
480V MCC 19-2	460	3.0 HP 1 80.0 85.0 625. 68.0 3600 .0000	
Running Load : Condition 1:		.0 HP 2: 2.7 HP 3: 2.7 HP 4: 2.7 HP	

Rec #	626	DG1 CLG WTR PMP CLR FAN A	Status : E
	Rated	Eff PF LRC St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys	
DG 1 CLR FAN A TERM	460	1.5 HP 1 75.0 80.0 625. 83.0 1740 .0000	
Running Load : Condition 1:		1.4 HP 2: 1.4 HP 3: 1.4 HP 4: 1.4 HP	

Rec #	627	DG1 CLG WTR PMP CLR FAN B	Status : E
	Rated	Eff PF LRC St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys	
DG 1 CLR FAN B TERM	460	1.5 HP 1 75.0 80.0 625. 83.0 1740 .0000	
Running Load : Condition 1:		1.4 HP 2: 1.4 HP 3: 1.4 HP 4: 1.4 HP	

Rec #	628	RHR SW PMP 1D CLR FAN A	Status : E	*** Safety - Related ***
	Rated	Eff PF LRC St pf	SC TC Modification # / Cable	
Source Bus	Volts	Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys		
480V MCC 19-2	460	3.0 HP 1 80.0 85.0 625. 68.0 3600 .0000		
Running Load : Condition 1:		.0 HP 2: 2.7 HP 3: 2.7 HP 4: 2.7 HP		

Rec #	629	RHR SW PMP 1D CLR FAN B	Status : E	*** Safety - Related ***
	Rated	Eff PF LRC St pf	SC TC Modification # / Cable	
Source Bus	Volts	Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys		
480V MCC 19-2	460	3.0 HP 1 80.0 85.0 625. 68.0 3600 .0000		
Running Load : Condition 1:		.0 HP 2: 2.7 HP 3: 2.7 HP 4: 2.7 HP		

Rec #	630	RHR SW PMP 1D CLR FAN C	Status : E	*** Safety - Related ***
	Rated	Eff PF LRC St pf	SC TC Modification # / Cable	
Source Bus	Volts	Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys		
480V MCC 19-2	460	3.0 HP 1 80.0 85.0 625. 68.0 3600 .0000		
Running Load : Condition 1:		.0 HP 2: 2.7 HP 3: 2.7 HP 4: 2.7 HP		

Date :

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Chicago, Ill.

185290

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DATProj. No. : 8913-94
Unit : 1

*** Load Data ***

Rec # 631 RHR SW PMP 1D CLR FAN D Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 19-2	460.	3.0 HP	1	80.0	85.0	625.	68.0	3600	.0000		
Running Load : Condition 1: .0 HP 2: 2.7 HP 3: 2.7 HP 4: 2.7 HP											

Rec # 632 5707 RX FD PUMP VENT FAN 1B Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 19-2	460.	50.0 HP	1	90.0	85.0	625.	38.0	1800	.0000		
Running Load : Condition 1: 45.0 HP 2: 45.0 HP 3: 45.0 HP 4: 45.0 HP											

Rec # 633 1-5620A TURB BEARING LIFT PMP A Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 19-3	460.	10.0 HP	1	85.0	85.0	625.	54.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: 9.0 HP 3: 9.0 HP 4: 9.0 HP											

Rec # 634 1-5620B TURB BEARING LIFT PMP B Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 19-3	460.	10.0 HP	1	85.0	85.0	625.	54.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: 9.0 HP 3: 9.0 HP 4: 9.0 HP											

Rec # 635 1-5620C TURB BEARING LIFT PMP C Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 19-3	460.	10.0 HP	1	85.0	85.0	625.	54.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: 9.0 HP 3: 9.0 HP 4: 9.0 HP											

Rec # 636 1-5620D TURB BEARING LIFT PMP D Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 19-3	460.	10.0 HP	1	85.0	85.0	625.	54.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: 9.0 HP 3: 9.0 HP 4: 9.0 HP											

Rec # 637 1-5620E TURB BEARING LIFT PMP E Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 19-3	460.	10.0 HP	1	85.0	85.0	625.	54.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: 9.0 HP 3: 9.0 HP 4: 9.0 HP											

Date :

Sargent & Lundy Engineers
Chicago, Ill.Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DATProj. No. : 8913-94
Unit : 1

*** Load Data ***

Rec # 638 1-5600 TURBINE TURNING GEAR Status : E

Source Bus	Rated Volts	Rating Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable	Master Diagram #	#	Sys
480V MCC 19-3	460.	50.0 HP 1	90.0	85.0	625.	38.0	1175	.0000			
Running Load : Condition 1: .0 HP 2: 50.0 HP 3: 50.0 HP 4: 50.0 HP											

Rec # 639 1-5608 TURB TURNING GEAR OIL PMP Status : E

Source Bus	Rated Volts	Rating Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable	Master Diagram #	#	Sys
480V MCC 19-3	460.	50.0 HP 1	90.0	85.0	625.	38.0	1760	.0000			
Running Load : Condition 1: .0 HP 2: 45.0 HP 3: 45.0 HP 4: 45.0 HP											

Rec # 640 1-5788E DRYWELL CLG BLR 1E Status : E

Source Bus	Rated Volts	Rating Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable	Master Diagram #	#	Sys
480V MCC 19-3	460.	84.0 HP 1	90.0	85.0	625.	37.0	1800	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 641 1-5788 DRYWELL CLG BLR 1D Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable	Master Diagram #	#	Sys
480V MCC 19-4	460.	84.0 HP 1	90.0	85.0	625.	37.0	1800	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 642 1/2-7503B SBT AIR HTRS Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable	Master Diagram #	#	Sys
SBGT AIR HTR TERM	480.	30.0 KW R	100.0	100.0	0.	20.0	0	.0000			
Running Load : Condition 1: 25.0 KW 2: 25.0 KW 3: 25.0 KW 4: 25.0 KW											

Rec # 643 1/2-7506B SBT FAN Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable	Master Diagram #	#	Sys
SBGT FAN TERM	460.	20.0 HP 1	85.0	85.0	625.	44.0	1760	.0000			
Running Load : Condition 1: 20.0 HP 2: 20.0 HP 3: 20.0 HP 4: 20.0 HP											

Rec # 644 ACAD AIR COMPR Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable	Master Diagram #	#	Sys
ACAD AIR COMP TERM	460.	25.0 HP 1	85.0	85.0	625.	43.0	1760	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Date :

Sargent & Lundy Engineers
Chicago, Ill.Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DATProj. No. : 8913-94
Unit : 1

*** Load Data ***

Rec # 645 DRYWELL/TORUS DIFF PR COMPR Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 19-4	460	50.0 HP	1	90.0	85.0	625.	38.0	1725	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 646 1-7503 RX BLDG VENT TO STANDBY GAS Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
RX SBTG DAMPER 1 TER	460.	1.0 HP	1	75.0	80.0	625.	79.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 647 1/2-7504B SBTG OUTSIDE AIR SUPP DMPR Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
SBTG OUT DAMPER TERM	460.	.1 HP	1	75.0	80.0	625.	85.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 648 1/2-7507B SBTG SYS FAN DISCH DAMPER Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
SBTG DISCH DAMPER TE	460.	2.7 HP	1	80.0	85.0	625.	68.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 649 1/2-7505B SBTG SYS INLET DAMPERS Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
SBTG INLET DAMPER TE	460.	.7 HP	1	75.0	80.0	625.	83.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 650 1-1001-26B RHRS CONTAIN SPRAY ISOL VLV Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 19-4	460.	1.6 HP	1	75.0	80.0	638.	75.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 651 1-1001-23B RHRS BACKUP CONTAIN SPRAY Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 19-4	460.	1.6 HP	1	75.0	80.0	638.	75.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Date :

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Chicago, Ill.Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DATProj. No. : 8913-94
Unit : 1

*** Load Data ***

Rec # 652 1-1001-34B RHRS MN SHUTOFF SUPP VLV 1B Status : E *** Safety - Related ***

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type (%)	(%)	Speed (sec) Master Diagram # # Sys
480V MCC 19-4	460.	4.0 HP	1	80.0	85.0 354. 58.0 1800 .0000
Running Load : Condition 1:	.0 HP	2:	.0 HP	3:	.0 HP 4: .0 HP

Rec # 653 1-1001-36B RHRS SUPP CHAMBER DUMPLTNE Status : E *** Safety - Related ***

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type (%)	(%)	Speed (sec) Master Diagram # # Sys
480V MCC 19-4	440.	2.6 HP	1	80.0	85.0 477. 68.0 1800 .0000
Running Load : Condition 1:	.0 HP	2:	.0 HP	3:	.0 HP 4: .0 HP

Rec # 654 1-1001-37B RHRS SUPP CHAMBER SPRAY HDR Status : E *** Safety - Related ***

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type (%)	(%)	Speed (sec) Master Diagram # # Sys
480V MCC 19-4	460.	.7 HP	1	75.0	80.0 271. 83.0 1800 .0000
Running Load : Condition 1:	.0 HP	2:	.0 HP	3:	.0 HP 4: .0 HP

Rec # 655 1-1001-43C RHRS SHUTDWN COOLING VLV 1C Status : E *** Safety - Related ***

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type (%)	(%)	Speed (sec) Master Diagram # # Sys
480V MCC 19-4	460.	1.0 HP	1	75.0	80.0 357. 79.0 1800 .0000
Running Load : Condition 1:	.0 HP	2:	.0 HP	3:	.0 HP 4: .0 HP

Rec # 656 1-1001-43D RHRS SHUTDWN COOLING VLV 1D Status : E *** Safety - Related ***

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type (%)	(%)	Speed (sec) Master Diagram # # Sys
480V MCC 19-4	460.	1.0 HP	1	75.0	80.0 257. 79.0 1800 .0000
Running Load : Condition 1:	.0 HP	2:	.0 HP	3:	.0 HP 4: .0 HP

Rec # 657 1-1001-19B RHRS COOLING PMP CROSS HDR Status : E *** Safety - Related ***

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type (%)	(%)	Speed (sec) Master Diagram # # Sys
480V MCC 19-4	460.	2.6 HP	1	80.0	85.0 354. 68.0 1800 .0000
Running Load : Condition 1:	.0 HP	2:	.0 HP	3:	.0 HP 4: .0 HP

Rec # 658 1-1001-16B RHRS HX R1003B BYPASS VLV1B Status : E *** Safety - Related ***

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type (%)	(%)	Speed (sec) Master Diagram # # Sys
480V MCC 19-4	460.	2.6 HP	1	80.0	85.0 476. 68.0 1800 .0000
Running Load : Condition 1:	.0 HP	2:	.0 HP	3:	.0 HP 4: .0 HP

Date :

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Chicago, Ill.

185290

Utility : Sargent & Lundy Internal Use

Proj. No. : 8913-94

Station : QUAD CITIES-FILE:21.DAT

Unit : 1

*** Load Data ***

Rec # 659 1-1001-7C RHRS COOLANT 1002C PMP SUCT Status : E *** Safety - Related ***

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type	(%) (%) (%) (%)	Speed (sec) Master Diagram # # Sys
480V MCC 19-4	460	1.0 HP	1	75.0 80.0	357. 79.0 1800 .0000
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP					

Rec # 660 1-1001-7D RHRS COOLANT 1002D PMP SUCT Status : E *** Safety - Related ***

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type	(%) (%) (%) (%)	Speed (sec) Master Diagram # # Sys
480V MCC 19-4	460	1.0 HP	1	75.0 80.0	571. 79.0 1800 .0000
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP					

Rec # 661 1-1001-5B RHRS CNMT COOLANT HX VLV 1B Status : E *** Safety - Related ***

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type	(%) (%) (%) (%)	Speed (sec) Master Diagram # # Sys
480V MCC 19-4	460	.6 HP	1	75.0 80.0	571. 83.0 1800 .0000
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP					

Rec # 662 1/2-5795-30 CONTRL RM RTN AIR FAN 1/2 Status : E *** Safety - Related ***

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type	(%) (%) (%) (%)	Speed (sec) Master Diagram # # Sys
CONT RM RTN FAN TERM	460	30.0 HP	1	85.0 85.0	625. 42.0 1750 .0000
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP					

Rec # 663 1-202-6A RX WTR RECIRC LOOP EQUAL VL Status : E *** Safety - Related ***

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type	(%) (%) (%) (%)	Speed (sec) Master Diagram # # Sys
480V MCC 18/19-5	460	8.0 HP	1	80.0 85.0	827. 54.0 1800 .0000
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP					

Rec # 664 1-202-4A RX WTR RECIRC PMP SUCT VLV Status : E *** Safety - Related ***

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type	(%) (%) (%) (%)	Speed (sec) Master Diagram # # Sys
480V MCC 18/19-5	460	16.0 HP	1	85.0 85.0	625. 44.0 3500 .0000
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP					

Rec # 665 1-202-5A RX WTR RECIRC PMP DISCH VLV Status : E *** Safety - Related ***

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type	(%) (%) (%) (%)	Speed (sec) Master Diagram # # Sys
480V MCC 18/19-5	460	14.0 HP	1	85.0 85.0	777. 49.0 3420 .0000
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP					

Date :

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Chicago, Ill.

Utility : Sargent & Lundy Internal Use

Proj. No. : 8913-94

Station : QUAD CITIES-FILE:Z1.DAT

Unit : 1

*** Load Data ***

Rec # 666 1-1001-29A RHRS INBOARD SHUTOFF VLV Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 18/19-5	460.	20.0 HP	1	85.0	85.0	759.	44.0	3365	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 667 1-1001-28A RHRS OUTBOARD SHUTOFF VLV Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 18/19-5	460.	52.0 HP	1	90.0	85.0	771.	38.0	3530	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 668 1-202-9A RX WTR RECIRC LOOP EQUAL VL Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 18/19-5	440.	.1 HP	1	75.0	80.0	625.	85.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 669 1-202-6B RX WTR RECIRC PMP SUCTION Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 18/19-5	440.	8.0 HP	1	80.0	85.0	827.	54.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 670 1-202-4B RX WTR RECIRC PMP DISCH VLV Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 18/19-5	460.	16.0 HP	1	85.0	85.0	625.	44.0	1800	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 671 1-202-5B RX WTR RECIRC PMP DISCH VLV Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 18/19-5	460.	14.0 HP	1	85.0	85.0	777.	49.0	3420	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 672 1-1001-29B RHRS INBOARD SHUTOFF VLV Status : E *** Safety - Related ***

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification #	Cable #	Sys
480V MCC 18/19-5	460.	20.0 HP	1	85.0	85.0	759.	44.0	3365	.0000		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Date :

Sargent & Lundy Engineers
Chicago, Ill.

185290

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DATProj. No. : 8913-94
Unit : 1

*** Load Data ***

Rec # 673 1-1001-288 RHRS OUTBOARD SHUTOFF VLV Status : E *** Safety - Related ***
 Rated Eff PF LRC St pf SC TC Modification # / Cable
 Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys
 480V MCC 18/19-5 460. 52.0 HP 1 90.0 85.0 943. 38.0 1800 .0000
 Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP

Rec # 674 1-202-9B RX WTR RECIRC LOOP EQUAL VL Status : E *** Safety - Related ***
 Rated Eff PF LRC St pf SC TC Modification # / Cable
 Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys
 480V MCC 18/19-5 440. .1 HP 1 75.0 80.0 625. 85.0 1800 .0000
 Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP

Rec # 675 1-5788C DRYWELL CLG BLWR 1C Status : E
 Rated Eff PF LRC St pf SC TC Modification # / Cable
 Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys
 480V MCC 19-6 460. 84.0 HP 1 90.0 85.0 625. 37.0 1800 .0000
 Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP

Rec # 676 1-5788G DRYWELL CLG BLWR 1G Status : E
 Rated Eff PF LRC St pf SC TC Modification # / Cable
 Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys
 480V MCC 19-6 460. 84.0 HP 1 90.0 85.0 625. 37.0 1800 .0000
 Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP

Rec # 677 1/2-2901-06 THROTTLE TEST VALVE Status : E
 Rated Eff PF LRC St pf SC TC Modification # / Cable
 Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys
 480V MCC 30 460. .1 HP 1 75.0 80.0 625. 85.0 1800 .0000
 Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP

Rec # 678 1/2-2901-07 THROTTLE TEST VLV Status : E
 Rated Eff PF LRC St pf SC TC Modification # / Cable
 Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys
 480V MCC 30 460. .3 HP 1 75.0 80.0 625. 85.0 1800 .0000
 Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP

Rec # 679 1/2-5799 AIR COND UNIT Status : E
 Rated Eff PF LRC St pf SC TC Modification # / Cable
 Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys
 480V MCC 30 460. 25.0KVA 1 85.0 85.0 625. 43.0 1800 .0000
 Running Load : Condition 1: 25.0 KVA 2: .0 KVA 3: 25.0 KVA 4: 25.0 KVA

Date : 04-27-92

Sargent & Lundy Engineers

Chicago, Ill.

Utility : Sargent & Lundy Internal Use

Proj. No. : 8913-94

Station : QUAD CITIES-FILE:Z1.DAT

Unit : 1

*** Load Data ***

Rec # 890 1-57140 RHRSW VAULTS EXHAUST FAN Status : M

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable (sec) Master Diagram # # Sys
480V MCC 15-2	460	2.0 HP	I	84.0	84.0	862.	75.0	1750	.0000 M04-1-91-011 68343
Running Load : Condition 1: 2.0 HP 2: 2.0 HP 3: .0 HP 4: 2.0 HP									

Rec # 891 1-2399-40 HPCI INBD ISOLN VLV Status : M

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable (sec) Master Diagram # # Sys
480V MCC 19-1	460.	.3 HP	I	75.0	80.0	602.	85.0	1800	.0000 M04-1-91-013B 68350
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP									

Rec # 892 TURB TRNG GEAR PGBK MOTOR Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable (sec) Master Diagram # # Sys
480V MCC 19-3	440.	1.4 HP	I	85.0	60.0	625.	20.0	450	.0000
Running Load : Condition 1: .0 HP 2: 1.3 HP 3: 1.3 HP 4: 1.3 HP									

Rec # 893 1-3701 CLSD CLG WTR HD ISO VLV Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable (sec) Master Diagram # # Sys
480V MCC 19-1	460.	2.3 HP	I	90.0	85.0	625.	20.0	1700	.0000
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP									

Rec # 894 TURBINE OIL CENTRIFUGE Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable (sec) Master Diagram # # Sys
480V MCC 19-3	460.	2.0 HP	I	90.0	67.0	648.	20.0	1740	.0000
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP									

Rec # 895 1-1402-3B CORE SPRY PUMP SUC VLV 1B Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable (sec) Master Diagram # # Sys
480V MCC 19-1	460.	3.2 HP	I	90.0	85.0	625.	20.0	1700	.0000
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP									

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Date :

***** Running Voltage Summary *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-94
Unit : 1

* Source Number : 3 *

Internal Bus No.		Bus Rated Volts	Bus Running Voltage and Per Cent of Bus Rated Volts				
			Cond. 1	Cond. 2	Cond. 3	Cond. 4	Cond. 5
3	Source EQUIVELANT SOURCE 3	4160.0	3845.1 92.4 %	3845.1 92.4 %	3845.1 92.4 %	3845.1 92.4 %	
15	4KV SWGR 14-1	4160.0	3845.1 92.4 %	3845.0 92.4 %	3845.0 92.4 %	3845.0 92.4 %	
29	HIGH SIDE OF XFMR 19	4160.0	3844.1 92.4 %	3843.4 92.4 %	3843.4 92.4 %	3843.4 92.4 %	
30	480V SWGR 19	480.0	447.4 93.2 %	440.7 91.8 %	440.7 91.8 %	440.6 91.8 %	
61	480V MCC 19-1	480.0	447.2 93.2 %	437.1 91.1 %	437.1 91.1 %	436.9 91.0 %	
62	480V MCC 19-2	480.0	443.4 92.4 %	435.9 90.8 %	435.9 90.8 %	435.8 90.8 %	
63	480V MCC 19-3	480.0	447.4 93.2 %	433.0 90.2 %	433.0 90.2 %	432.9 90.2 %	
64	480V MCC 19-4	480.0	445.4 92.8 %	438.6 91.4 %	438.6 91.4 %	438.6 91.4 %	
65	480V MCC 18/19-5	480.0	447.4 93.2 %	440.7 91.8 %	440.7 91.8 %	440.6 91.8 %	
66	480V MCC 19-6	480.0	447.4 93.2 %	440.7 91.8 %	440.7 91.8 %	440.6 91.8 %	
81	DG CLG WTR PUMP TERM	480.0	438.1 91.3 %	431.2 89.8 %	431.2 89.8 %	431.1 89.8 %	
82	HPCI AIR UNIT TERM	480.0	447.2 93.2 %	425.3 88.6 %	425.3 88.6 %	425.1 88.6 %	
83	HPCI CLG SEAL PMP TE	480.0	447.2 93.2 %	437.1 91.1 %	437.1 91.1 %	436.9 91.0 %	
84	RHRS AIR HDLG 1B TER	480.0	447.2 93.2 %	422.3 88.0 %	422.3 88.0 %	422.1 87.9 %	
85	POSTY LOCA H2/O2 TERM	480.0	447.2 93.2 %	435.0 90.6 %	435.0 90.6 %	434.8 90.6 %	

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***** Running Voltage Summary *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : B913-94

Unit : 1

* Source Number : 3 *

Bus Running Voltage and Per Cent of Bus Rated Volts

Internal Bus No.	Bus Rated Volts					
		Cond. 1	Cond. 2	Cond. 3	Cond. 4	Cond. 5
86	STBY LQD PMP TERM	480.0	447.2 93.2 %	437.1 91.1 %	437.1 91.1 %	436.9 91.0 %
87	DG OIL XFER PMP TERM	480.0	447.2 93.2 %	437.1 91.1 %	437.1 91.1 %	420.4 87.6 %
88	DG RM HVAC FAN TERM	480.0	447.2 93.2 %	429.2 89.4 %	429.2 89.4 %	429.0 89.4 %
89	CORE SPRY AIR 1B TER	480.0	447.2 93.2 %	426.3 88.8 %	426.3 88.8 %	426.0 88.8 %
90	HPCI TANK HTR TERM	480.0	447.2 93.2 %	437.1 91.1 %	437.1 91.1 %	436.9 91.0 %
91	DG OIL XFER PMP 2 TE	480.0	447.2 93.2 %	437.1 91.1 %	437.1 91.1 %	436.9 91.0 %
92	RHR EMER AIR 2B TERM	480.0	447.2 93.2 %	437.1 91.1 %	437.1 91.1 %	436.9 91.0 %
93	DG RM HVAC FAN 2 TER	480.0	447.2 93.2 %	437.1 91.1 %	437.1 91.1 %	436.9 91.0 %
94	DG STG COMP 1A TERM	480.0	443.4 92.4 %	424.5 88.4 %	424.5 88.4 %	424.4 88.4 %
95	DG STG COMP 1B TERM	480.0	443.4 92.4 %	424.3 88.4 %	424.3 88.4 %	424.2 88.4 %
96	DG 1 CLR FAN A TERM	480.0	437.5 91.1 %	429.8 89.5 %	429.8 89.5 %	429.7 89.5 %
97	DG 1 CLR FAN B TERM	480.0	437.7 91.2 %	430.1 89.6 %	430.1 89.6 %	430.0 89.6 %
98	RHR PMP 1C FAN A TER	480.0	443.4 92.4 %	432.4 90.1 %	432.4 90.1 %	432.3 90.1 %
99	250 V BTRY CHGR TERM	480.0	440.6 91.8 %	433.1 90.2 %	433.1 90.2 %	433.0 90.2 %
100	125 V BTRY CHGR TERM	480.0	441.3 91.9 %	433.8 90.4 %	433.8 90.4 %	433.7 90.3 %

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***** Running Voltage Summary *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : B913-94
Unit : 1

* Source Number : 3 *

Internal Bus No.		Bus Rated Volts	Bus Running Voltage and Per Cent of Bus Rated Volts				
			Cond. 1	Cond. 2	Cond. 3	Cond. 4	Cond. 5
101	RX SBT DAMPER 1 TER	480.0	445.4 92.8 %	438.6 91.4 %	438.6 91.4 %	438.6 91.4 %	
102	SBGT INLET DAMPER TE	480.0	445.4 92.8 %	438.6 91.4 %	438.6 91.4 %	438.6 91.4 %	
103	SBGT DISCH DAMPER TE	480.0	445.4 92.8 %	438.6 91.4 %	438.6 91.4 %	438.6 91.4 %	
104	SBGT OUT DAMPER TERM	480.0	445.4 92.8 %	438.6 91.4 %	438.6 91.4 %	438.6 91.4 %	
105	ACAD AIR COMP TERM	480.0	445.4 92.8 %	438.6 91.4 %	438.6 91.4 %	438.6 91.4 %	
106	SBGT FAN TERM	480.0	431.5 89.9 %	424.6 88.5 %	424.6 88.5 %	424.5 88.4 %	
107	SBGT AIR HTR TERM	480.0	435.9 90.8 %	429.0 89.4 %	429.0 89.4 %	428.9 89.4 %	
108	CONT RM RTN FAN TERM	480.0	447.4 93.2 %	440.7 91.8 %	440.7 91.8 %	440.6 91.8 %	

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Date :

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:21.DAT

Proj. No. : B913-94
Unit : 1

Bus Name : 480V SWGR 19
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
578	1-1902B / FUEL POOL CLG WTR PMP 1B Status : E Load type : Induction	100.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	85.0	90.0	625.0	1800	.0000
579	1-3701B RX BLDG CLG WTR PMP 1B Status : E Load type : Induction	125.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	85.0	90.0	625.0	1800	.0000
								*** Safety - Related ***				
580	1-5704B RX BLDG EXH FAN 1B Status : E Load type : Induction	100.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	85.0	90.0	625.0	1775	.0000
581	1-5704C RX BLDG EXH FAN 1C Status : E Load type : Induction	100.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	85.0	90.0	625.0	1775	.0000
582	1-5703A RX BLDG SPLY FAN 1A Status : E Load type : Induction	100.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	85.0	90.0	625.0	1800	.0000
583	1-5705C TURB BLDG EXH FAN 1C Status : E Load type : Induction	150.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	85.0	90.0	625.0	1780	.0000
584	RX BLDG LTGING 1B Status : E Load type : Resistive	72.0 KVA	60.7 KVA	60.7 KVA	60.7 KVA	60.7 KVA	60.7 KVA	90.0	100.0	.0	0	.0000
								*** Safety - Related ***				
585	1-5702B E. TURB BLDG SPLY FAN 1B Status : E Load type : Induction	100.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	85.0	90.0	625.0	1800	.0000
587	1/2-3701C RX BLDG CLG PMP 1/2C Status : E Load type : Induction	125.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	85.0	90.0	625.0	1800	.0000
61	Bus name : 480V MCC 19-1 Connection rating : 220.0 Amps		4. kVA	75. kVA	75. kVA	78. kVA						
62	Bus name : 480V MCC 19-2 Connection rating : 220.0 Amps		187. kVA	223. kVA	223. kVA	223. kVA						
63	Bus name : 480V MCC 19-3 Connection rating : 220.0 Amps		0. kVA	143. kVA	143. kVA	143. kVA						
64	Bus name : 480V MCC 19-4 Connection rating : 220.0 Amps		45. kVA	45. kVA	45. kVA	45. kVA						
65	Bus name : 480V MCC 18/19-5 Connection rating : 220.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						

Date :

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
 Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-94
 Unit : 1

Bus Name : 480V SWGR 19
 Rated Voltage : 480.0 volts
 Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
66	Bus name : 480V MCC/19-6 Connection rating : 280.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						
81	Bus name : DG CLG WTR PUMP TERM Connection rating : 400.0 Amps		85. kVA	85. kVA	85. kVA	85. kVA						
Total kVA input :			381.	630.	630.	633.						
kW :			351.	564.	564.	567.						
kVAR :			148.	280.	280.	281.						

Date :

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
 Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-69
 Unit : 1

Bus Name : 480V MCC 19-1
 Rated Voltage : 480.0 volts
 Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kw kVA	Max. Design hp/kw/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
592	120/208V XFMR FD 19-1-1	15.0	4.1	4.1	4.1	4.1		75.0	100.0	.0	0	.0000
Status : E	Load type : Resistive	KVA	KVA	KVA	KVA	KVA		*** Safety - Related ***				
595	1-1279-2B RX WTR CLNUP SYS FLTR HDPMP	2.0	.0	1.8	1.8	1.8		85.0	80.0	625.0	1800	.0000
Status : E	Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
596	1-5708-1B DRYWELL & TORUS PRG EXH FAN	30.0	.0	.0	.0	.0		85.0	85.0	625.0	1750	.0000
Status : E	Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
598	1-1279-11B RESIN FEED TANK AGITATOR	.8	.0	.0	.0	.0		80.0	75.0	625.0	1800	.0000
Status : E	Load type : Induction	HP	HP	HP	HP	HP						
601	1-1205B RX WTR CLNUP SYS RECIRC PMP	50.0	.0	.0	.0	.0		85.0	90.0	625.0	1800	.0000
Status : E	Load type : Induction	HP	HP	HP	HP	HP						
604	1-1201-80 RX WTR CLNUP SYS BOILER VLV	1.0	.0	.0	.0	.0		80.0	75.0	625.0	1800	.0000
Status : E	Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
605	1-2301-4 HPCI TURB STM SUPPLY VLV	1.0	.0	.0	.0	.0		80.0	75.0	640.0	1800	.0000
Status : E	Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
606	1-1001-186B RHRS HX REV INLET VLV	1.7	.0	.0	.0	.0		80.0	75.0	325.0	1800	.0000
Status : E	Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
607	1-1402-24B CORE SPRAY OTBD ISOL VLV 1B	4.0	.0	.0	.0	.0		85.0	80.0	827.0	1800	.0000
Status : E	Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
608	1-1402-25B CORE SPRAY INBD ISOL VLV 1B	8.0	.0	.0	.0	.0		85.0	80.0	827.0	1800	.0000
Status : E	Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
609	1-1402-4B CS TEST BYPASS VLV 1B	1.6	.0	.0	.0	.0		80.0	75.0	256.0	1800	.0000
Status : E	Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
610	1-1001-185B RHRS HX NORM OUTLET VLV	1.7	.0	.0	.0	.0		80.0	75.0	350.0	1800	.0000
Status : E	Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
611	1-1001-187B RHRS HX REVERSE OUTLET VLV	1.6	.0	.0	.0	.0		80.0	75.0	300.0	1800	.0000
Status : E	Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
613	1-1001-4B RHRS HX NORMAL INLET VLV	3.7	.0	.0	.0	.0		85.0	80.0	590.0	1800	.0000
Status : E	Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				

Date :

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
 Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-69
 Unit : 1

Bus Name : 480V MCC 19-1
 Rated Voltage : 480.0 volts
 Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kw/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
891	1-2399-40 / HPCI 1NBD ISOLN VLV Status : M Load type : Induction	.3 HP	.0 HP	.0 HP	.0 HP	.0 HP		80.0	75.0	602.0	1800	.0000
893	1-3701 CLSD CLG WTR HD ISO VLV Status : E Load type : Induction	2.3 HP	.0 HP	.0 HP	.0 HP	.0 HP		85.0	90.0	625.0	1700	.0000
895	1-1402-3B CORE SPRY PUMP SUC VLV 2B Status : E Load type : Induction	3.2 HP	.0 HP	.0 HP	.0 HP	.0 HP		85.0	90.0	625.0	1700	.0000
82	Bus name : HPCI AIR UNIT TERM Connection rating : 400.0 Amps		0. kVA	3. kVA	3. kVA	3. kVA						
83	Bus name : HPCI CLG SEAL PMP TE Connection rating : 400.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						
84	Bus name : RHRS AIR HDLG 1B TER Connection rating : 400.0 Amps		0. kVA	9. kVA	9. kVA	9. kVA						
85	Bus name : POST LOCA H2/O2 TERM Connection rating : 400.0 Amps		0. kVA	1. kVA	1. kVA	1. kVA						
86	Bus name : STBY LQD PMP TERM Connection rating : 400.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						
87	Bus name : DG OIL XFER PMP TERM Connection rating : 400.0 Amps		0. kVA	0. kVA	0. kVA	3. kVA						
88	Bus name : DG RM HVAC FAN TERM Connection rating : 400.0 Amps		0. kVA	50. kVA	50. kVA	50. kVA						
89	Bus name : CORE SPRY AIR 1B TER Connection rating : 400.0 Amps		0. kVA	6. kVA	6. kVA	6. kVA						
90	Bus name : HPCI TANK HTR TERM Connection rating : 400.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						
91	Bus name : DG OIL XFER PMP 2 TE Connection rating : 400.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						
92	Bus name : RHR EMER AIR 2B TERM Connection rating : 400.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						

Date :

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***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
 Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-69
 Unit : 1

Bus Name : 480V MCC 19-1
 Rated Voltage : 480.0 volts
 Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load/Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)	
			1	2	3	4	5						
93	Bus name : DG RM HVAC FAN 2 TER Connection rating : 400.0 Amps		0. —kVA	0. kVA	0. kVA	0. kVA							
Total kVA input :			4.	74.	74.	77.							
kW :			3.	63.	63.	66.							
kVAR :			3.	39.	39.	41.							

Date :

Sargent & Lundy Engineers

Chicago, Ill.

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
 Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-69
 Unit : 1

Bus Name : 480V MCC 19-2
 Rated Voltage : 480.0 volts
 Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kw/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
614	1-5701 RECIRC MG SET VENT FAN1A Status : E Load type : Induction	60.0 HP	.0 HP	.0 HP	.0 HP	.0 HP		85.0 *** Safety - Related ***	90.0	625.0	1200	.0000
615	RX PROT M-G SET 1B Status : E Load type : Induction	25.0 HP	16.5 HP	16.5	16.5	16.5	HP	85.0 *** Safety - Related ***	85.0	625.0	1787	.0000
620	TURB BLDG EMERG LGTS Status : E Load type : Resistive	47.0 KW	.0 KW	.0 KW	.0 KW	.0 KW		90.0 *** Safety - Related ***	100.0	.0	0	.0000
621	AF DG2 CLG WTR PMP FAN A&B Status : E Load type : Induction	3.0 HP	.0 HP	.0 HP	.0 HP	.0 HP		80.0	75.0	625.0	1800	.0000
623	RHR SW PMP 1C CLR FAN B Status : E Load type : Induction	3.0 HP	.0 HP	2.7 HP	2.7 HP	2.7 HP		85.0	80.0	625.0	3600	.0000
624	RHR SW PMP 1C CLR FAN C Status : E Load type : Induction	3.0 HP	.0 HP	2.7 HP	2.7 HP	2.7 HP		85.0	80.0	625.0	3600	.0000
625	RHR SW PMP 1C CLR FAN D Status : E Load type : Induction	3.0 HP	.0 HP	2.7 HP	2.7 HP	2.7 HP		85.0	80.0	625.0	3600	.0000
628	RHR SW PMP 1D CLR FAN A Status : E Load type : Induction	3.0 HP	.0 HP	2.7 HP	2.7 HP	2.7 HP		85.0 *** Safety - Related ***	80.0	625.0	3600	.0000
629	RHR SW PMP 1D CLR FAN B Status : E Load type : Induction	3.0 HP	.0 HP	2.7 HP	2.7 HP	2.7 HP		85.0 *** Safety - Related ***	80.0	625.0	3600	.0000
630	RHR SW PMP 1D CLR FAN C Status : E Load type : Induction	3.0 HP	.0 HP	2.7 HP	2.7 HP	2.7 HP		85.0 *** Safety - Related ***	80.0	625.0	3600	.0000
631	RHR SW PMP 1D CLR FAN D Status : E Load type : Induction	3.0 HP	.0 HP	2.7 HP	2.7 HP	2.7 HP		85.0 *** Safety - Related ***	80.0	625.0	3600	.0000
632	5707 RX FD PUMP VENT FAN 1B Status : E Load type : Induction	50.0 HP	45.0 HP	45.0 HP	45.0 HP	45.0 HP		85.0	90.0	625.0	1800	.0000
94	Bus name : DG STG COMP 1A TERM Connection rating : 400.0 Amps		0. kVA	6. kVA	6. kVA	6. kVA						
95	Bus name : DG STG COMP 1B TERM Connection rating : 400.0 Amps		0. kVA	6. kVA	6. kVA	6. kVA						

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***** Load Summary L/ Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-94
Unit : 1

Bus Name : 480V MCC 19-2
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
96	Bus name : DG 1 CLR FAN A TERM Connection rating : 400.0 Amps		2. kVA	2. kVA	2. kVA	2. kVA						
97	Bus name : DG 1 CLR FAN B TERM Connection rating : 400.0 Amps		2. kVA	2. kVA	2. kVA	2. kVA						
98	Bus name : RHR PMP 1C FAN A TER Connection rating : 400.0 Amps		0. kVA	3. kVA	3. kVA	3. kVA						
99	Bus name : 250 V BTRY CHGR TERM Connection rating : 400.0 Amps		86. kVA	86. kVA	86. kVA	86. kVA						
100	Bus name : 125 V BTRY CHGR TERM Connection rating : 400.0 Amps		36. kVA	36. kVA	36. kVA	36. kVA						
Total kVA input :			185.	220.	220.	220.						
kW :			171.	201.	201.	201.						
kVAR :			72.	91.	91.	91.						

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***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-69
Unit : 1

Bus Name : 480V MCC 19-3
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
633	1-5620A TURB BEARING LIFT PMP A Status : E Load type : Induction	10.0 HP	.0 HP	9.0 HP	9.0 HP	9.0 HP		85.0 *** Safety - Related ***	85.0	625.0	1800	.0000
634	1-5620B TURB BEARING LIFT PMP B Status : E Load type : Induction	10.0 HP	.0 HP	9.0 HP	9.0 HP	9.0 HP		85.0	85.0	625.0	1800	.0000
635	1-5620C TURB BEARING LIFT PMP C Status : E Load type : Induction	10.0 HP	.0 HP	9.0 HP	9.0 HP	9.0 HP		85.0	85.0	625.0	1800	.0000
636	1-5620D TURB BEARING LIFT PMP D Status : E Load type : Induction	10.0 HP	.0 HP	9.0 HP	9.0 HP	9.0 HP		85.0	85.0	625.0	1800	.0000
637	1-5620E TURB BEARING LIFT PMP E Status : E Load type : Induction	10.0 HP	.0 HP	9.0 HP	9.0 HP	9.0 HP		85.0	85.0	625.0	1800	.0000
638	1-5600 TURBINE TURNING GEAR Status : E Load type : Induction	50.0 HP	.0 HP	50.0 HP	50.0 HP	50.0 HP		85.0	90.0	625.0	1175	.0000
639	1-5608 TURB TURNING GEAR OIL PMP Status : E Load type : Induction	50.0 HP	.0 HP	45.0 HP	45.0 HP	45.0 HP		85.0	90.0	625.0	1760	.0000
640	1-5788E DRYWELL CLG BLR 1E Status : E Load type : Induction	84.0 HP	.0 HP	.0 HP	.0 HP	.0 HP		85.0	90.0	625.0	1800	.0000
892	TURB TRNG GEAR PGBK MOTOR Status : E Load type : Induction	1.4 HP	.0 HP	1.3 HP	1.3 HP	1.3 HP		60.0	85.0	625.0	450	.0000
894	TURBINE OIL CENTRIFUGE Status : E Load type : Induction	2.0 HP	.0 HP	.0 HP	.0 HP	.0 HP		67.0	90.0	648.0	1740	.0000

Total kVA input : 0. 141. 141. 141.

kW : 0. 119. 119. 119.

kVAR : 0. 75. 75. 75.

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***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DATProj. No. : 8913-69
Unit : 1Bus Name : 480V MCC 19-4
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
641	1-5788 DRYWELL CLG BLR 1D Status : E Load type : Induction	84.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	90.0	625.0	1800	.0000
								*** Safety - Related ***				
645	DRYWELL/TORUS DIFF PR COMPR Status : E Load type : Induction	50.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	90.0	625.0	1725	.0000
								*** Safety - Related ***				
650	1-1001-26B RHRS CONTAIN SPRAY ISOL VLV Status : E Load type : Induction	1.6 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	80.0	75.0	638.0	1800	.0000
								*** Safety - Related ***				
651	1-1001-23B RHRS BACKUP CONTAIN SPRAY Status : E Load type : Induction	1.6 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	80.0	75.0	638.0	1800	.0000
								*** Safety - Related ***				
652	1-1001-34B RHRS MW SHUTOFF SUPP VLV 1B Status : E Load type : Induction	4.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	80.0	354.0	1800	.0000
								*** Safety - Related ***				
653	1-1001-36B RHRS SUPP CHAMBER DUMPLINE Status : E Load type : Induction	2.6 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	80.0	477.0	1800	.0000
								*** Safety - Related ***				
654	1-1001-37B RHRS SUPP CHAMBER SPRAY HDR Status : E Load type : Induction	.7 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	80.0	75.0	271.0	1800	.0000
								*** Safety - Related ***				
655	1-1001-43C RHRS SHUTDWN COOLING VLV 1C Status : E Load type : Induction	1.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	80.0	75.0	357.0	1800	.0000
								*** Safety - Related ***				
656	1-1001-43D RHRS SHUTDWN COOLING VLV 1D Status : E Load type : Induction	1.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	80.0	75.0	257.0	1800	.0000
								*** Safety - Related ***				
657	1-1001-19B RHRS COOLING PMP CROSS HDR Status : E Load type : Induction	2.6 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	80.0	354.0	1800	.0000
								*** Safety - Related ***				
658	1-1001-16B RHRS HX R1003B BYPASS VLV 1B Status : E Load type : Induction	2.6 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	80.0	476.0	1800	.0000
								*** Safety - Related ***				
659	1-1001-7C RHRS COOLANT 1002C PMP SUCT Status : E Load type : Induction	1.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	80.0	75.0	357.0	1800	.0000
								*** Safety - Related ***				
660	1-1001-7D RHRS COOLANT 1002D PMP SUCT Status : E Load type : Induction	1.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	80.0	75.0	571.0	1800	.0000
								*** Safety - Related ***				
661	1-1001-5B RHRS CMNT COOLANT HX VLV 1B Status : E Load type : Induction	.6 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	80.0	75.0	571.0	1800	.0000
								*** Safety - Related ***				

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***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIPS-FILE:Z1.DAT

Proj. No. : 8913-69
Unit : 1

Bus Name : 480V MCC 19-4
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
101	Bus name : RX/SGT DAMPER 1 TER Connection rating : 400.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						
102	Bus name : SGT INLET DAMPER TE Connection rating : 400.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						
103	Bus name : SGT DISCH DAMPER TE Connection rating : 400.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						
104	Bus name : SGT OUT DAMPER TERM Connection rating : 400.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						
105	Bus name : ACAD AIR COMP TERM Connection rating : 400.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						
106	Bus name : SGT FAN TERM Connection rating : 400.0 Amps		21. kVA	21. kVA	21. kVA	21. kVA						
107	Bus name : SGT AIR HTR TERM Connection rating : 400.0 Amps		26. kVA	26. kVA	26. kVA	26. kVA						
Total kVA input :			45.	45.	45.	45.						
kW :			44.	44.	44.	44.						
kVAR :			11.	11.	11.	11.						

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***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DATProj. No. : 8913-69
Unit : 1Bus Name : 480V MCC 18/19-5
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
663	1-202-6A RX WTR RECIRC LOOP EQUAL VLV Status : E Load type : Induction	8.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	80.0	827.0	1800	.0000
								*** Safety - Related ***				
664	1-202-4A RX WTR RECIRC PMP SUCT VLV Status : E Load type : Induction	16.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	85.0	625.0	3500	.0000
								*** Safety - Related ***				
665	1-202-5A RX WTR RECIRC PMP DISCH VLV Status : E Load type : Induction	14.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	85.0	777.0	3420	.0000
								*** Safety - Related ***				
666	1-1001-29A RHRS INBOARD SHUTOFF VLV Status : E Load type : Induction	20.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	85.0	759.0	3365	.0000
								*** Safety - Related ***				
667	1-1001-28A RHRS OUTBOARD SHUTOFF VLV Status : E Load type : Induction	52.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	90.0	771.0	3530	.0000
								*** Safety - Related ***				
668	1-202-9A RX WTR RECIRC LOOP EQUAL VLV Status : E Load type : Induction	.1 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	80.0	75.0	625.0	1800	.0000
								*** Safety - Related ***				
669	1-202-6B RX WTR RECIRC PMP SUCTION Status : E Load type : Induction	8.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	80.0	827.0	1800	.0000
								*** Safety - Related ***				
670	1-202-4B RX WTR RECIRC PMP DISCH VLV Status : E Load type : Induction	16.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	85.0	625.0	1800	.0000
								*** Safety - Related ***				
671	1-202-5B RX WTR RECIRC PMP DISCH VLV Status : E Load type : Induction	14.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	85.0	777.0	3420	.0000
								*** Safety - Related ***				
672	1-1001-29B RHRS INBOARD SHUTOFF VLV Status : E Load type : Induction	20.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	85.0	759.0	3365	.0000
								*** Safety - Related ***				
673	1-1001-28B RHRS OUTBOARD SHUTOFF VLV Status : E Load type : Induction	52.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	90.0	943.0	1800	.0000
								*** Safety - Related ***				
674	1-202-9B RX WTR RECIRC LOOP EQUAL VLV Status : E Load type : Induction	.1 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	80.0	75.0	625.0	1800	.0000
								*** Safety - Related ***				

108 Bus name : CONT RM RTH FAN TERM

Connection rating : 400.0 Amps

0.	0.	0.	0.
kVA	kVA	kVA	kVA

Total kVA input : 0. 0. 0. 0.

kW : 0. 0. 0. 0.

kVAR : 0. 0. 0. 0.

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***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DATProj. No. : 8913-69
Unit : 1Bus Name : 480V MCC 19-6
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./	Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
				1	2	3	4	5					
675	1-5788C	DRYWELL CLG BLWR 1C	84.0	.0	.0	.0	.0		85.0	90.0	625.0	1800	.0000
	Status : E	Load type : Induction	HP	HP	HP	HP	HP						
676	1-5788G	DRYWELL CLG BLWR 1G	84.0	.0	.0	.0	.0		85.0	90.0	625.0	1800	.0000
	Status : E	Load type : Induction	HP	HP	HP	HP	HP						
Total kVA input :				0.	0.	0.	0.						
kW :				0.	0.	0.	0.						
kVAR :				0.	0.	0.	0.						

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***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-69
Unit : 1

Bus Name : DG CLG WTR PUMP TERM
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
586	1-3903 / DG CLG WTR PHP #1	100.0	90.0	90.0	90.0	90.0		91.2	88.5	541.0	3525	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
Total kVA input :			83.	83.	83.	83.						
kW :			76.	76.	76.	76.						
kVAR :			34.	34.	34.	34.						

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***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-69
Unit : 1

Bus Name : HPCI AIR UNIT TERM
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition.					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
597	1-5747 HPCI EMERG AHU	3.0	0	3.0	3.0	3.0		85.0	80.0	625.0	1755	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
Total kVA Input :			0.	3.	3.	3.						
kW :			0.	3.	3.	3.						
kVAR :			0.	2.	2.	2.						

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***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DATProj. No. : 8913-69
Unit : 1Bus Name : HPCI CLG SEAL PMP TE
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition.					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
599	2301-57 HPCI CLG WTR GLW SL CONDPMP	25.0	.0	.0	.0	.0	85.0	85.0	625.0	3530	.0000	
	Status : E Load type : Induction	HP	HP	HP	HP	HP	*** Safety - Related ***					

Total kVA input : 0. 0. 0. 0.

kW : 0. 0. 0. 0.

kVAR : 0. 0. 0. 0.

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***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-69
Unit : 1

Bus Name : RHRS AIR HDLG 1B TER
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kw kVA	Max. Design hp/kw/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
594	1-57468 RHRS EMERG AHU 1B	7.5	0	7.5	7.5	7.5	85.0	80.0	625.0	1800	.0000	
	Status : E Load type : Induction	HP	HP	HP	HP	HP	*** Safety - Related ***					

Total kVA input : 0. 8. 8. 8.

kW : 0. 7. 7. 7.

kVAR : 0. 4. 4. 4.

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***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-69
Unit : 1

Bus Name : POST LOCA H2/O2 TERM
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
602	POST LOCA H2 O2 MOW PMP	1.0	.0	.9	.9	.9	80.0	75.0	625.0	1800	.0000	
Status : E	Load type : Induction	HP	HP	HP	HP	HP	*** Safety - Related ***					

Total kVA input : 0. 1. 1. 1.

kW : 0. 1. 1. 1.

kVAR : 0. 1. 1. 1.

Date :

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***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
 Station : QUAD CITIES-FILE:21.DAT

Proj. No. : 8913-69
 Unit : 1

Bus Name : STBY LQD PMP TERM
 Rated Voltage : 480.0 volts
 Source : 3, EQUIVELANT SOURCE 3

Load or Bus		Rated hp/kW	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
No.	** Equip. No./ Load Name or Bus Name **		1	2	3	4	5					
593	1-1102B / STNDBY LQD CNTRL PMP 1B	50.0	.0	.0	.0	.0	.0	85.0	90.0	625.0	1770	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP	HP					
Total kVA input :			0.	0.	0.	0.						
kW :			0.	0.	0.	0.						
kVAR :			0.	0.	0.	0.						

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***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
 Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-69
 Unit : 1

Bus Name : DG OIL XFER PMP TERM
 Rated Voltage : 480.0 volts
 Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
591	5203-1 / DG FUEL OIL XFER PMP #1	3.0	.0	.0	.0	2.7	85.0	80.0	625.0	1755	.0000	
	Status : E Load type : Induction	HP	HP	HP	HP	HP	*** Safety - Related ***					
Total kVA Input :			0.	0.	0.	3.						
kW :			7.	0.	0.	3.						
kVAR :			0.	0.	0.	2.						

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***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-69
Unit : 1

Bus Name : DG RM HVAC FAN TERM
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
588	1-5727 / HVAC SPLY FAN#1 NORMAL FEED	50.0	0	50.0	50.0	50.0		85.0	90.0	625.0	1800	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
Total kVA input :			0.	49.	49.	49.						
kW :			0.	41.	41.	41.						
kVAR :			0.	26.	26.	26.						

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***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-69
Unit : 1

Bus Name : CORE SPRY AIR 1B TER
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
589	1-57488 CORESPRAY EMERG AHU 1B	5.0	.0	5.0	5.0	5.0		85.0	80.0	625.0	1740	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
Total kVA input :			0.	5.	5.	5.						
kW :			0.	5.	5.	5.						
kVAR :			0.	3.	3.	3.						

Date :

Sargent & Lundy Engineers
Chicago, Ill.

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DATProj. No. : 8913-69
Unit : 1Bus Name : HPCI TANK HTR TERM
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
612	HPCI TANK HEATER	9.0	.0	.0	.0	.0	100.0	100.0	.0	0	.0000	
	Status : E Load type : Resistive	KW	KW	KW	KW	KW	*** Safety - Related ***					

Total kVA input : 0. 0. 0. 0.

kW : 0. 0. 0. 0.

kVAR : 0. 0. 0. 0.

185290

AC Electrical Load Monitoring System Ver 2.20

Date :

Sargent & Lundy Engineers
Chicago, Ill.

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:21.DATProj. No. : 8913-69
Unit : 1Bus Name : DG OIL XFER PMP 2 TE
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load/Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
590	5203-1 / ALT FD DGW2 FUEL OIL XFRPMP	3.0	.0	.0	.0	.0	85.0	80.0	625.0	1755	.0000	
	Status : E Load type : Induction	HP	HP	HP	HP	HP	*** Safety - Related ***					

Total kVA input : 0. 0. 0. 0.

kW : 0. 0. 0. 0.

kVAR : 0. 0. 0. 0.

AC Electrical Load Monitoring System Ver 2.20
Sargent & Lundy Engineers
Chicago, Ill.

185290

Date :

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-69
Unit : 1

Bus Name : RHR EMER AIR 2B TERM
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
603	2-57468 / ALT FD RHRS EMERG AHU 2B	7.5	.0	.0	.0	.0		85.0	80.0	625.0	1800	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP						
Total kVA input :			0.	0.	0.	0.						
kW :			0.	0.	0.	0.						
kVAR :			0.	0.	0.	0.						

185290

AC Electrical Load Monitoring System Ver 2.20

Date :

Sargent & Lundy Engineers

Chicago, Ill.

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
 Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-69
 Unit : 1

Bus Name : DG RM HVAC FAN 2 TER
 Rated Voltage : 480.0 volts
 Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No. / Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
600	2-5727 / ALT FD DG RM HVAC SPLY FAN2	50.0	.0	.0	.0	.0	85.0	90.0	625.0	1800	.0000	
	Status : E Load type : Induction	HP	HP	HP	HP	HP						

Total kVA input : 0. 0. 0. 0.

kW : 0. 0. 0. 0.

kVAR : 0. 0. 0. 0.

Date :

Sargent & Lundy Engineers
Chicago, Ill.

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use

Proj. No. : 8913-69

Bus Name : DG STG COMP 1A TERM

Station : QUAD CITIES-FILE:Z1.DAT

Unit : 1

Rated Voltage : 480.0 volts

Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
618	DG STARTING AIR COMPR 1A	5.0	0	5.0	5.0	5.0	85.0	80.0	625.0	1735	.0000	
Status : E	Load type : Induction	HP	HP	HP	HP	HP	*** Safety - Related ***					

Total kVA input : 0. 5. 5. 5.

kW : 0. 5. 5. 5.

kVAR : 0. 3. 3. 3.

Date :

AC Electrical Load Monitoring System Ver 2.20
Sargent & Lundy Engineers
Chicago, Ill.

18529

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-69
Unit : 1

Bus Name : DG STD COMP 1B TERM
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
616	DG STARTING AIR COMPR 1B	5.0	0.0	5.0	5.0	5.0		80.0	80.0	625.0	1735	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
Total kVA input :			0.	5.	5.	5.						
kW :			0.	5.	5.	5.						
kVAR :			0.	3.	3.	3.						

AC Electrical Load Monitoring System Ver 2.20
Sargent & Lundy Engineers
Chicago, Ill.

185290

Date :

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-69
Unit : 1

Bus Name : DG 1 CLR FAN A TERM
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
626	DG1 CLG WTR PMP CLR FAN A	1.5	1.4	1.4	1.4	1.4		80.0	75.0	625.0	1740	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP						
Total kVA input :			2.	2.	2.	2.						
kW :			1.	1.	1.	1.						
kVAR :			1.	1.	1.	1.						

AC Electrical Load Monitoring System Ver 2.20
Sargent & Lundy Engineers
Chicago, Ill.

185200

Date :

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : B913-69
Unit : 1

Bus Name : DG 1 CLR FAN B TERM
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
627	DG1 CLG WTR PMP CLR FAN B	1.5	1.4	1.4	1.4	1.4		80.0	75.0	625.0	1740	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP						
Total kVA input :			2.	2.	2.	2.						
kW :			1.	1.	1.	1.						
kVAR :			1.	1.	1.	1.						

Date :

Sargent & Lundy Engineers
Chicago, Ill.

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DATProj. No. : 8913-69
Unit : 1Bus Name : RHR PMP 1C FAN A TER
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition.					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
622	RHR SW PMP 1C CLR FAN A	3.0	.0	2.7	2.7	2.7	85.0	80.0	625.0	3600	.0000	
Status : E	Load type : Induction	HP	HP	HP	HP	HP	*** Safety - Related ***					

Total kVA input : 0. 3. 3. 3.

kW : 0. 3. 3. 3.

kVAR : 0. 2. 2. 2.

185290

AC Electrical Load Monitoring System Ver 2.10
Sargent & Lundy Engineers
Chicago, Ill.

Date :

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-94
Unit : 1

Bus Name : 250 V BTRY CHGR TERM
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition:					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
617	250VDC BATTERY CHARGER #1	94.0	85.3	85.3	85.3	85.3		95.0	100.0	.0	0	.0000
	Status : E Load type : Resistive	KVA	KVA	KVA	KVA	KVA		*** Safety - Related ***				
Total kVA input :			85.	85.	85.	85.						
kW :			81.	81.	81.	81.						
kVAR :			27.	27.	27.	27.						

Date :

AC Electrical Load Monitoring System Ver 2.10
Sargent & Lundy Engineers
Chicago, Ill.

70901

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:21.DAT

Proj. No. : 8913-94
Unit : 1

Bus Name : 125 V BTRY CHGR TERM
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
619	125VDC BATTERY CHARGER #1	39.9	36.2	36.2	36.2	36.2		95.0	100.0	.0	0	.0000
	Status : E Load type : Resistive	KVA	KVA	KVA	KVA	KVA		*** Safety - Related ***				
Total kVA input :			36.	36.	36.	36.						
kW :			34.	34.	34.	34.						
kVAR :			11.	11.	11.	11.						

185290

Date :

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-69
Unit : 1

Bus Name : RX SBTG DAMPER 1 TER
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
646	1-7503 / RX BLDG VENT TO STANDBY GAS	1.0	.0	.0	.0	.0	.0	80.0	75.0	625.0	1800	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP	HP					
Total kVA input :			0.	0.	0.	0.	0.					
kW :			0.	0.	0.	0.	0.					
kVAR :			0.	0.	0.	0.	0.					

Date :

185200

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
 Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-69
 Unit : 1

Bus Name : SBT INLET DAMPER TE
 Rated Voltage : 480.0 volts
 Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load/Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
649	1/2-7505B / SBT SYS INLET DAMPERS Status : E Load type : Induction	.7 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	80.0	75.0	625.0	1800	.0000
*** Safety - Related ***												
Total kVA input :			0.	0.	0.	0.						
kW :			0.	0.	0.	0.						
kVAR :			0.	0.	0.	0.						

AC Electrical Load Monitoring System Ver 2.20
Sargent & Lundy Engineers
Chicago, Ill.

Date :

185290

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-69
Unit : 1

Bus Name : SBT DISCH DAMPER TE
Rated Voltage : 480.0 volts
Source : 3, EQUIVANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
64B	1/2-7507B / SBT SYS FAN DISCH DAMPER	2.7	.0	.0	.0	.0		85.0	80.0	625.0	1800	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
Total kVA input :			0.	0.	0.	0.						
kW :			0.	0.	0.	0.						
kVAR :			0.	0.	0.	0.						

AC Electrical Load Monitoring System Ver 2.20
Sargent & Lundy Engineers
Chicago, Ill.

185290

Date :

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-69
Unit : 1

Bus Name : SBT OUT DAMPER TERM
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kw kVA	Max. Design hp/kw/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
647	1/2-7504B / SBT OUTSIDE AIR SUPP DMPR	.1	.0	.0	.0	.0	.0	80.0	75.0	625.0	1800	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
Total kVA input :			0.	0.	0.	0.						
kW :			0.	0.	0.	0.						
kVAR :			0.	0.	0.	0.						

Date :

Sargent & Lundy Engineers

Chicago, Ill.

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
 Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-69
 Unit : 1

Bus Name : ACAD AIR COMP TERM
 Rated Voltage : 480.0 volts
 Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kw kVA	Max. Design hp/kw/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
644	ACAD AIR COMP	25.0	.0	.0	.0	.0	85.0	85.0	625.0	1760	.0000	
	Status : E Load type : Induction	HP	HP	HP	HP	HP	*** Safety - Related ***					

Total kVA input : 0. 0. 0. 0.

KW : 0. 0. 0. 0.

kVAR : 0. 0. 0. 0.

AC Electrical Load Monitoring System Ver 2.20
Sargent & Lundy Engineers
Chicago, Ill.

Date :

185290

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:21.DAT

Proj. No. : 8913-69
Unit : 1

Bus Name : SBTG FAN TERM
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
643	1/2-75068 / SBTG FAN	20.0	20.0	20.0	20.0	20.0	20.0	85.0	85.0	625.0	1760	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP	HP	*** Safety - Related ***				
Total kVA input :			21.	21.	21.	21.						
kW :			18.	18.	18.	18.						
kVAR :			11.	11.	11.	11.						

AC Electrical Load Monitoring System Ver 2.20
Sargent & Lundy Engineers
Chicago, Ill.

185290

Date :

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : B913-69
Unit : 1

Bus Name : SBTG AIR HTR TERM
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
642	1/2-75038 / SBTG AIR HTRS	30.0	25.0	25.0	25.0	25.0	100.0	100.0	.0	0	.0000	
	Status : E Load type : Resistive	KW	KW	KW	KW	KW	*** Safety - Related ***					

Total kVA input : 25. 25. 25. 25.

kW : 25. 25. 25. 25.
kVAR : 0. 0. 0. 0.

Date :

AC Electrical Load Monitoring System ver 2.20
Sargent & Lundy Engineers
Chicago, Ill.

185290

***** Load Summary by Bus *****

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:Z1.DAT

Proj. No. : 8913-69
Unit : 1

Bus Name : CONT RM RTN FAN TERM
Rated Voltage : 480.0 volts
Source : 3, EQUIVELANT SOURCE 3

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EFF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
662	1/2-5795-30 CONTRL RM RTN AIR FAN 1/2	30.0	.0	.0	.0	.0		85.0	85.0	625.0	1750	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
Total kVA input :			0.	0.	0.	0.						
kW :			0.	0.	0.	0.						
kVAR :			0.	0.	0.	0.						

SARGENT & LUNDY
ENGINEERS

Calc. For Quad Cities 1/11 Safety-related Continuous

Load Running/Starting Voltages

X Safety-Related Non-Safety-Related

185290

Client	Commonwealth Edison Company
Project	Quad Cities Unit 1
Proj. No.	8913-69 Equip. No.

Prepared by	Date
Reviewed by	Date
Approved by	Date

APPENDIX B
CASE B COMPUTER PRINTOUTS
(BLOCK MOTOR STARTING EVALUATION)

185295

SARGENT & LUNDY
ENGINEERS

Calc. For Quad Cities 1/11 Safety-related Continuous

Load Running/Starting Voltages

X

Safety-Related

Non-Safety-Related

Client	Commonwealth Edison Company
Project	Quad Cities Unit 1
Proj. No.	8913-69 Equip. No.

Prepared by	Date
Reviewed by	Date
Approved by	Date

Listed in the following order:

Condition 1 Block Motor Starting, File: S11.DAT

Load Tickets for R Type Loads,
(Bus Data, Connection Data, and other loads remain
unchanged from Z1.DAT)
Motor Block Starting Printout

Condition 2 Block Motor Starting, File: S12.DAT

Load Tickets for R Type Loads,
(Bus Data, Connection Data, and other loads remain
unchanged from Z1.DAT)
Motor Block Starting Printout

185290

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:S11.DAT

Project No. : 8913-69
Unit No. 1

AC Load Ticket

Record Number = 584

Equip. No. / Load Name ...	RX BLDG LTGING 16
Status (E,N, or M)	E (Existing, New, or Modified)
Source Bus Name	480V SWGR 19
Motor Rated Volts	480.0
Rated hp, kW, or kVA	72.0 *** Load Brake Power ***
Units (hp,kW, or kVA)	KVA
Load Type (I,S,G or R) ...	R
Rated Efficiency (%)	100.0
Rated Power Factor (%) ...	90.0
Locked Rotor Current (%) ..	0.
Starting Power Factor (%) ..	20.0
Speed (RPM)	0
S.C. Time Constant (sec) ..	.0000
Mod or M/D Number	
Cable Number	
System Code	
Safety Related (Y/N)	Yes

Routing:

Comments:

Prepared by: _____

Reviewed by: _____

Approved by: _____

185290

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:S11.DAT

Project No. : 8913-69
Unit No. 1

AC Load Ticket

Record Number: 592

Equip. No. / Load Name ... 120/208V XFMR FD 19-1-1
Status (E,N, or M)..... E (Existing, New, or Modified)
Source Bus Name 480V MCC 19-1
Motor Rated Volts 480.0
Rated hp/ kW, or kVA 15.0 *** Load Brake Power ***
Units (hp,kW, or kVA) KVA Cond 1 : 3.8 KVA
Load Type (I,S,G or R) ... R Cond 2 : 4.1 KVA
Rated Efficiency (%) 100.0 Cond 3 : 4.1 KVA
Rated Power Factor (%) ... 75.0 Cond 4 : 4.1 KVA
Locked Rotor Current (%) . 0. Cond 5 : .0 KVA
Starting Power Factor (%) 20.0
Speed (RPM) 0
S.C. Time Constant (sec) . .0000
Mod or M/D Number
Cable Number
System Code
Safety Related (Y/N) Yes

Routing:

Comments:

Prepared by: _____

Reviewed by: _____

Approved by: _____

*** Sargent & Lundy -- ELMS-AC Program ***

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:S11.DAT

Project No. : B913-69
Unit No. 1

AC Load Ticket

Record Number: 617

Equip. No. / Load Name ... 250VDC BATTERY CHARGER #1
Status (E,N, or M) E (Existing, New, or Modified)
Source Bus Name 250 V BTRY CHGR TERM
Motor Rated Volts 480.0
Rated hp/ kW, or kVA 94.0 *** Load Brake Power ***
Units (hp,kW, or kVA) KVA Cond 1 : 81.1 KVA
Load Type (I,S,G or R) ... R Cond 2 : 85.3 KVA
Rated Efficiency (%) 100.0 Cond 3 : 85.3 KVA
Rated Power Factor (%) ... 95.0 Cond 4 : 85.3 KVA
Locked Rotor Current (%) . 0. Cond 5 : .0 KVA
Starting Power Factor (%) 20.0
Speed (RPM) 0
S.C. Time Constant (sec) . .0000
Mod or M/D Number
Cable Number
System Code
Safety Related (Y/N) Yes

Routing:

Comments:

Prepared by: _____

Reviewed by: _____

Approved by: _____

185290

*** Sargent & Lundy -- ELMS-AC Program ***

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:S11.DAT

Project No. : B913-69
Unit No. 1

AC Load Ticket

Record Number: 619

Equip. No. / Load Name ... 125VDC BATTERY CHARGER #1
Status (E,N, or M)..... E (Existing, New, or Modified)
Source Bus Name 125 V BTRY CHGR TERM
Motor Rated Volts 480.0
Rated hp, kW, or kVA 39.9 *** Load Brake Power ***
Units (hp,kW, or kVA) KVA
Load Type (I,S,G or R) ... R
Rated Efficiency (%) 100.0
Rated Power Factor (%) ... 95.0
Locked Rotor Current (%) . 0.
Starting Power Factor (%) 20.0
Speed (RPM) 0
S.C. Time Constant (sec) . .0000
Mod or M/D Number
Cable Number
System Code
Safety Related (Y/N) Yes

Cond 1 :	34.4 KVA
Cond 2 :	36.2 KVA
Cond 3 :	36.2 KVA
Cond 4 :	36.2 KVA
Cond 5 :	.0 KVA

Routing:

Comments:

Prepared by: _____

Reviewed by: _____

Approved by: _____

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*** Sargent & Lundy -- ELMS-AC Program ***

Utility : Sargent & Lundy Internal Use
Station : GUAD CITIES-FILE:S11.DAT

Project No. : 8913-69
Unit No. 1

AC Load Ticket

Record Number # 642

Equip. No. / Load Name ... 1/2-7503B SBTG AIR HTRS
Status (E,N, or M) E (Existing, New, or Modified)
Source Bus Name ... SBTG AIR HTR TERM
Motor Rated Volts/ 480.0
Rated hp, kW, or kVA 30.0 *** Load Brake Power ***
Units (hp, kW, or kVA) KW Cond 1 : 22.2 KW
Load Type (I, S, G or R) ... R Cond 2 : 25.0 KW
Rated Efficiency (%) 100.0 Cond 3 : 25.0 KW
Rated Power Factor (%) ... 100.0 Cond 4 : 25.0 KW
Locked Rotor Current (%) . 0. Cond 5 : .0 KW
Starting Power Factor (%) 20.0
Speed (RPM) 0
S.C. Time Constant (sec) . .0000
Mod or M/D Number
Cable Number
System Code
Safety Related (Y/N) Yes

Routing:

Comments:

Prepared by: _____

Reviewed by: _____

Approved by: _____

SARGENT & LUNDY ELMS-AC ** MOTOR START VOLTAGE SUMMARY ** SOURCE : 3 COND : 1

Motor Number	Motor Name	
586	1-3903	DG CLG WTR PMP #1
604	1-1201-80	RX WTR CLNUP SYS BOILER VLV
626		DG1 CLG WTR PMP CLR FAN A
627		DG1 CLG WTR PMP CLR FAN B
643	1/2-7505B	SBGT FAN ₄
647	1/2-7504B	SBGT OUTSIDE AIR SUPP DMPR
648	1/2-7507B	SBGT SYS FAN DISCH DAMPER
649	1/2-7505B	SBGT SYS INLET DAMPERS
666	1-1001-29A	RHFS INBOARD SHUTOFF VLV
669	1-202-6B	RX WTR RECIRC PMP SUCTION
671	1-202-9B	RX WTR RECIRC PMP DISCH VLV

SARGENT & LUNDY ELMS-AC ** MOTOR START VOLTAGE SUMMARY ** SOURCE : 3 COND : 1

INTERNAL		BUS RUNNING	BUS RATED	% OF
BUS NUMBER	BUS NAME	VOLTS	VOLTS	RATED
3	SOURCE EQUIVELANT SOURCE 3	3845.2	4160.0	92.4
15	4KV SWGR 14-1	3845.0	4160.0	92.4
29	HIGH SIDE OF XFMR 19	3842.1	4160.0	92.4
30	480V SWGR 19	418.4	480.0	87.2
61	480V MCC 19-1	417.9	480.0	87.1
62	480V MCC 19-2	413.9	480.0	86.2
63	480V MCC 19-3	418.4	480.0	87.2
64	480V MCC 19-4	412.5	480.0	85.9
65	480V MCC 19/19-5	407.4	480.0	84.9
66	480V MCC 19-6	418.4	480.0	87.2
81	DG CLG WTR PUMP TERM	385.6	480.0	80.3
82	HPCI AIR UNIT TERM	417.9	480.0	87.1
83	HPCI CLG SEAL PMP TE	417.9	480.0	87.1
84	RHRS AIR HDLG 1B TER	417.9	480.0	87.1
85	POST LOCA H2/O2 TERM	417.9	480.0	87.1
86	STBY LQD PMP TERM	417.9	480.0	87.1
87	DG OIL XFER PMP TERM	417.9	480.0	87.1
88	DG RM HVAC FAN TERM	417.9	480.0	87.1
89	CORE SPRY AIR 1B TER	417.9	480.0	87.1
90	HPCI TANK HTR TERM	417.9	480.0	87.1
91	DG OIL XFER PMP 2 TE	417.9	480.0	87.1
92	RHR EMER AIR 2B TERM	417.9	480.0	87.1
93	DG RM HVAC FAN 2 TER	417.9	480.0	87.1
94	DG STG COMP 1A TERM	413.9	480.0	86.2
95	DG STG COMP 1B TERM	413.9	480.0	86.2
96	DG 1 CLR FAN A TERM	381.0	480.0	79.4
97	DG 1 CLR FAN B TERM	382.1	480.0	79.6
98	RHR PMP 1C FAN A TER	413.9	480.0	86.2
99	250 V BTRY CHGR TERM	411.1	480.0	85.7
100	125 V BTRY CHGR TERM	411.8	480.0	85.8
101	RX SSGT DAMPER 1 TER	412.5	480.0	85.9
102	SSGT INLET DAMPER TE	399.9	480.0	83.3
103	SSGT DISCH DAMPER TE	372.3	480.0	77.6
104	SSGT OUT DAMPER TERM	411.5	480.0	85.7
105	ACAD AIR COMP TERM	412.5	480.0	85.9
106	SSGT FAN TERM	371.9	480.0	77.5
107	SSGT AIR HTR TERM	403.4	480.0	84.0
108	CONT RM RTN FAN TERM	407.4	480.0	84.9

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:S12.DAT

Project No. : 8913-69
Unit No. 1

AC Load Ticket

Record Number = 584

Equip. No. / Load Name ...	RX BLDG LTGING 1B
Status (E,N, or M).....	E (Existing, New, or Modified)
Source Bus Name	480V SWGR 19
Motor Rated Volts	480.0
Rated hp/ kW, or kVA	72.0
Units (hp,kW, or kVA)	KVA
Load Type (I,S,G or R) ...	R
Rated Efficiency (%)	100.0
Rated Power Factor (%) ...	90.0
Locked Rotor Current (%) ..	0.
Starting Power Factor (%) ..	20.0
Speed (RPM)	0
S.C. Time Constant (sec) ..	.0000
Mod or M/D Number	
Cable Number	
System Code	
Safety Related (Y/N)	Yes

*** Load Brake Power ***
Cond 1 : 60.7 KVA
Cond 2 : 59.0 KVA
Cond 3 : 60.7 KVA
Cond 4 : 60.7 KVA
Cond 5 : .0 KVA

Routing:

Comments:

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Prepared by: _____

Reviewed by: _____

Approved by: _____

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*** Sargent & Lundy -- ELMS-AC Program ***

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:S12.DAT

Project No. : 8913-69
Unit No. 1

AC Load Ticket

Record Number = 592

Equip. No. / Load Name ... 120/208V XFMR FD 19-1-1
Status (E,N, or M)..... E (Existing, New, or Modified)
Source Bus Name .. 480V MCC 19-1
Motor Rated Volts 480.0
Rated hp, kW, or kVA 15.0 *** Load Brake Power ***
Units (hp, kW, or kVA) KVA Cond 1 : 4.1 KVA
Load Type (I, S, G or R) ... R Cond 2 : 4.0 KVA
Rated Efficiency (%) 100.0 Cond 3 : 4.1 KVA
Rated Power Factor (%) ... 75.0 Cond 4 : 4.1 KVA
Locked Rotor Current (%) . 0. Cond 5 : .0 KVA
Starting Power Factor (%) 20.0
Speed (RPM) 0
S.C. Time Constant (sec) . .0000
Mod or M/D Number
Cable Number
System Code
Safety Related (Y/N) Yes

Routing:

Comments:

Prepared by: _____

Reviewed by: _____

Approved by: _____

185290

*** Sargent & Lundy -- ELMS-AC Program ***

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:S12.DAT

Project No. : 8913-69
Unit No. 1

AC Load Ticket

Record Number # 617

Equip. No. / Load Name ... 250VDC BATTERY CHARGER #1
Status (E,N, or M) E (Existing, New, or Modified)
Source Bus Name 250 V BTRY CHGR TERM
Motor Rated Volts/ 480.0
Rated hp, kW, or kVA 94.0 *** Load Brake Power ***
Units (hp, kW, or kVA) KVA Cond 1 : 85.3 KVA
Load Type (I, S, G or R) ... R Cond 2 : 83.7 KVA
Rated Efficiency (%) 100.0 Cond 3 : 85.3 KVA
Rated Power Factor (%) ... 95.0 Cond 4 : 85.3 KVA
Locked Rotor Current (%) . 0. Cond 5 : .0 KVA
Starting Power Factor (%) 20.0
Speed (RPM) 0
S.C. Time Constant (sec) . .0000
Mod or M/D Number
Cable Number
System Code
Safety Related (Y/N) Yes

Routing:

Comments:

82

Prepared by: _____

Reviewed by: _____

Approved by: _____

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:S12.DAT

Project No. : 8913-69
Unit No. 1

AC Load Ticket

Record Number # 619 14

Equip. No. / Load Name ...	125VDC BATTERY CHARGER #1
Status (E,N, or M) ,.....	E (Existing, New, or Modified)
Source Bus Name	125 V BTRY CHGR TERM
Motor Rated Volts/.....	480.0
Rated hp, /kW, or /kVA	39.9 *** Load Brake Power ***
Units (hp, kW, or kVA)	KVA
Load Type (I, S, G or R) ...	R
Rated Efficiency (%)	100.0
Rated Power Factor (%) ...	95.0
Locked Rotor Current (%) .	0.
Starting Power Factor (%)	20.0
Speed (RPM)	0
S.C. Time Constant (sec) .	.0000
Mod or M/D Number	
Cable Number	
System Code	
Safety Related (Y/N)	Yes

Cond 1 : —	36.2 KVA
Cond 2 :	35.5 KVA
Cond 3 :	36.2 KVA
Cond 4 :	36.2 KVA
Cond 5 :	.0 KVA

Routing:

Comments:

Prepared by: _____

Reviewed by: _____

Approved by: _____

*** Sargent & Lundy -- ELMS-AC Program ***

Utility : Sargent & Lundy Internal Use
Station : QUAD CITIES-FILE:S12.DAT

Project No. : 8913-69
Unit No. 1

AC Load Ticket

Record Number: 642

Equip. No. / Load Name ... 1/2-75038 SBT AIR HTRS
Status (E,N, or M) E (Existing, New, or Modified)
Source Bus Name SBT AIR HTR TERM
Motor Rated Volts 480.0
Rated hp, kW, or kVA 30.0 *** Load Brake Power ***
Units (hp, kW, or kVA) KW Cond 1 : 25.0 KW
Load Type (I, S, G or R) ... R Cond 2 : 24.1 KW
Rated Efficiency (%) 100.0 Cond 3 : 25.0 KW
Rated Power Factor (%) ... 100.0 Cond 4 : 25.0 KW
Locked Rotor Current (%) . 0. Cond 5 : .0 KW
Starting Power Factor (%) 20.0
Speed (RPM) 0
S.C. Time Constant (sec) . .0000
Mod or M/D Number
Cable Number
System Code
Safety Related (Y/N) Yes

Routing:

Comments:

Prepared by: _____

Reviewed by: _____

Approved by: _____

SARGENT & LUNDY ELMS-AC ** MOTOR START VOLTAGE SUMMARY ** SOURCE : 3 COND : 2

Motor Number	Motor Name	
622		RHR SW PMP 1C CLR FAN A
623		RHR SW PMP 1C CLR FAN B
624		RHR SW PMP 1C CLR FAN C
625		RHR SW PMP 1C CLR FAN D
628		RHR SW PMP 1D CLR FAN A
629		RHR SW PMP 1D CLR FAN B
630		RHR SW PMP 1D CLR FAN C
631		RHR SW PMP 1D CLR FAN D
650	1-1001-26B	RHRS/ CONTAIN SPRAY ISOL VLV
651	1-1001-23B	RHRS BACKUP CONTAIN SPRAY
652	1-1001-34B	RHRS MN SHUTOFF SUPP VLV 1B
653	1-1001-36B	RHRS SUPP CHAMBER DUMPLTNE

SARGENT & LUNDY ELMS-AC ** MOTOR START VOLTAGE SUMMARY ** SOURCE : 3 COND : 2

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INTERNAL		BUS RUNNING	BUS RATED	% OF
BUS NUMBER	BUS NAME	VOLTS	VOLTS	RATED
3	SOURCE EQUIVELANT SOURCE 3	3845.1	4160.0	92.4
15	4KV SWGR 14-1	3845.0	4160.0	92.4
29	HIGH SIDE OF XFMR 19	3842.9	4160.0	92.4
30	480V SWGR 19	434.6	480.0	90.5
61	480V MCC 19-1	431.0	480.0	89.8
62	480V MCC 19-2	427.4	480.0	89.0
63	480V MCC 19-3	426.8	480.0	88.9
64	480V MCC 19-4	430.5	480.0	89.7
65	480V MCC 18/19-5	434.6	480.0	90.5
66	480V MCC 19-6	434.6	480.0	90.5
81	DG CLG WTR PUMP TERM	425.0	480.0	88.6
82	HPCI AIR UNIT TERM	419.0	480.0	87.3
83	HPCI CLG SEAL PMP TE	431.0	480.0	89.8
84	RHRS AIR HDLG 19 TER	416.0	480.0	86.7
85	POST LOCA H2/O2 TERM	428.9	480.0	89.4
86	STBY LQD PMP TERM	431.0	480.0	89.8
87	DG OIL XFER PMP TERM	431.0	480.0	89.8
88	DG RM HVAC FAN TERM	423.0	480.0	88.1
89	CORE SPRY AIR 1B TER	420.0	480.0	87.5
90	HPCI TANK HTR TERM	431.0	480.0	89.8
91	DG OIL XFER PMP 2 TE	431.0	480.0	89.8
92	RHR EMER AIR 2B TERM	431.0	480.0	89.8
93	DG RM HVAC FAN 2 TER	431.0	480.0	89.8
94	DG STG COMP 1A TERM	415.8	480.0	86.6
95	DG STG COMP 1B TERM	415.6	480.0	86.6
96	DG 1 CLR FAN A TERM	421.2	480.0	87.8
97	DG 1 CLR FAN B TERM	421.4	480.0	87.8
98	RHR PMP 1C FAN A TER	410.5	480.0	85.5
99	250 V BTRY CHGR TERM	424.6	480.0	88.5
100	125 V BTRY CHGR TERM	425.3	480.0	88.6
101	RX SBTG DAMPER 1 TER	430.5	480.0	89.7
102	SBGT INLET DAMPER TE	430.5	480.0	89.7
103	SBGT DISCH DAMPER TE	430.5	480.0	89.7
104	SBGT OUT DAMPER TERM	430.5	480.0	89.7
105	ACAD AIR COMP TERM	430.5	480.0	89.7
106	SBGT FAN TERM	416.1	480.0	86.7
107	SBGT AIR HTR TERM	421.0	480.0	87.7
108	CONT RM RTN FAN TERM	434.6	480.0	90.5