

*CHRON System*

**SARGENT & LUNDY  
ENGINEERS**

FOUNDED 1891

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184363

S&L Letter No. Q1449E

April 16, 1992

Project No. 8913-73

Commonwealth Edison Company  
Quad Cities Station - Unit 2

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-0060  
which transmits the following Sargent & Lundy calculation:

Calculation 8913-73-19-1, Revision 0, dated April 15, 1992,  
"Quad Cities 2/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

gdqc2685.ep

In duplicate

Enclosure - Addressee Only

Copies: (see page 2)

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PDR ADDCK 05000254  
P PDR

Mr. M. L. Reed  
Commonwealth Edison Company

S&L Letter No. Q1449E  
April 16, 1992  
Page 2

Copies:

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CHRON System	(1/1/1)
BWR Technical Lead Engineer (M. S. Tucker)	(1/1/0)
Site Engineering Supervisor (C. A. Moerke)	(1/1/0)
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**SARGENT & LUNDY**  
 ENGINEERS

**DESIGN INFORMATION TRANSMITTAL**

<input checked="" type="checkbox"/> SAFETY-RELATED	<input type="checkbox"/> NON-SAFETY-RELATED	DIT No. - <u>QC-EXT-0060</u>	
CLIENT <u>Commonwealth Edison Company</u> STATION <u>Quad Cities</u> UNIT(S) <u>2</u> PROJECT NO(S) <u>8913-73</u> SUBJECT <u>Transmittal of Calculation 8913-73-19-1, Rev. 0, Dated 4/15/92, "Quad Cities 2/II Safety-Related Continuous Load Running/Starting Voltages."</u> MODIFICATION OR DESIGN CHANGE NUMBER(S) <u>N/A</u>		Page <u>1</u> of <u>1</u> To <u>M. L. Reed</u>	
<u>R. M. Schievoni</u>	<u>EPED</u>	<u>[Signature]</u>	<u>04-15-92</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 obligation to said third party as to the accuracy, completeness, usefulness, or noninfringing 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 (CECo) the following calculation (including Reference Item A.):  
 Calculation 8913-73-19-1, Rev. 0, dated 4/15/92, "Quad Cities 2/II Safety-Related Continuous Load Running/Starting Voltages"  
 The purpose, methodology, and assumptions can be found in the following calculation sections and pages:  
 Purpose: Section III, Page 3  
 Methodology: Section IX, Pages 12-14 (ELMS-AC Version 2.2 is used.)  
 Assumptions and Engineering Judgements: Section VII, Pages 8-10.  
 References: Section V, Pages 5-6  
 Comparison of Calculated Results with Acceptance Criteria: Section XI, Pages 23-24.

**SOURCE OF INFORMATION**

Calc. No. 8913-73-19-1 0 4-15-92 Report No. N/A  
 Rev. and/or date Rev. and/or date  
 Other \_\_\_\_\_

**DISTRIBUTION** See Letter Q1449E, Dated April 16, 1992.

☒ SAFETY-RELATED☐ NON-SAFETY-RELATED

DIT No. - QC-EPED-0488-01

CLIENT CECoPage 1 of 14STATION QUAD CITIES UNIT(S) 2/IITo W BLOETHE - 21PROJECT NO(S) 8913-73SUBJECT QUAD CITIES UNIT 2, DIV II LOAD TABLES FOR SWITCHGEAR 29 AND MCC's

MODIFICATION OR DESIGN CHANGE NUMBER(S) \_\_\_\_\_

K. YIP  
Preparer (Please print name)EPED  
Division*[Signature]*  
Preparer's signature3-26-92  
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 2, 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)**DISTRIBUTION**

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ORIGINAL FILE 15D

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R. JASON - 21 (1/0)



March 21, 1992

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).

DIT No: QC-EPED-0488-01

PROJECT No: 8913-73

PAGE 2 OF 14

Page 1 of 4

March 21, 1992

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.

DIT No: QC-EPED-0488-01

PROJECT No: 8913-73

PAGE 3 OF 14

184363

March 21, 1992

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.

DIT No: QC-EPED-0488-01

PROJECT No: 8913-73

PAGE 4 OF 14

184363

March 21, 1992

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.

GA

DIT No: QC-EPED-0488-01

PROJECT No: 8913-73

PAGE 5 OF 14

# Appendix A - Load Tables (Pre-Mode)

Station: Jad Cities Units: 2

Fraperer: *ms Tulker*

Date: *3/21/92*

Concurrence: *(signature)*

Date: *3-23-92*

Concurrence: *DCB 3-24/92*

Date:

Load Center: SWGR 29

Comments  
By

Load Name	Equipment Number	LOCA Time Zero	RHR SW Initiation	CR Stdbby HVAC Initiation	Post LOCA Steady State	Remarks	SR or NSR
FUEL POOL CLG WTR PMP 2B	2-1902B	ON	ON	ON	ON		NSR
RX BLDG CLG WTR PMP 2B	2-3701B	ON	ON	ON	ON		NSR
RX BLDG EXH FAN 2B	2-5704B	TRIP	OFF	OFF	OFF	TRIP ON HIGH RAD OR GROUP II	NSR
RX BLDG EXH FAN 2C	2-5704C	TRIP	OFF	OFF	OFF	TRIP ON HIGH RAD OR GROUP II	NSR
RX BLDG SPLY FAN 2A	2-5703A	TRIP	OFF	OFF	OFF	TRIP ON HIGH RAD OR GROUP II	NSR
TURB BLDG EXH FAN 2C	2-5705C	ON	ON	ON	ON		NSR
RX BLDG LIGHTING 2		ON	ON	ON	ON		NSR
E. TURB BLDG SPLY FAN 2B	2-5702B	ON	ON	ON	ON		NSR
DG CLG WTR PMP #2	2-3903	START	ON	ON	ON		SR
RX BLDG CLG PMP 1/2C	1/2-3701C	ON	ON	ON	ON	COULD BE ON	NSR
480V MCC 29-1		ON	ON	ON	ON		SR
480V MCC 29-2		ON	ON	ON	ON		SR
480V MCC 29-3		ON	ON	ON	ON		SR
480V MCC 29-4		ON	ON	ON	ON		SR
480V MCC 28/29-5		ON	ON	ON	ON		SR
480V MCC 29-6		ON	ON	ON	ON		SR

DIT NO. GC-EPED-0488-01

PROJ. NO. 8913-73

PAGE 6 OF 14



Preparer: Ja Sultan Concurrence: (10)

Date: 3-25-92 Concurrence:

SCB-3-24-92

Date:

Load Center: MCC 29-1

Comments	Load Name	Equipment Number	LOCA Time Zero	RHR SW Initiation	CR Stdby HVAC	Post LOCA Steady State	Remarks	SR or NSR
S&L	NORM FD EDG HVAC SPLY FAN #2	2-5727	OFF	ON	ON	ON	STARTS AT 800 RPM	SR
	CORE SPRAY EMERG AHU 2B	2-5746B	OFF	ON	ON	ON	THERMOSTAT	SR
	NORM FEED DG OIL XFER PMP 2	2-5203	OFF	OFF	ON	ON		SR
	ALT FD DG #1 FUEL OIL XFRPMP	2-5203	OFF	OFF	OFF	OFF		SR
	120/208V XFMR FD 29-1-1		ON	ON	ON	ON		SR
	ST JDBY LQD CONTRL PMP 2B	2-1102B	OFF	OFF	OFF	OFF		SR
S&L	NORM FD RHRS EMERG AHU 2B	2-5746B	OFF	ON	ON	ON	THERMOSTAT	SR
S&L	RX WTR CLNUP SYS FLTR HOLDING PUMP	2-1279-2B	OFF	ON	ON	ON	START ON LD FLOW AFTER GROUP III	NSR
S&L	DW&TORUS PURGE EXH FAN 2B	2-5708B	OFF	OFF	OFF	OFF		NSR
DVL	HPCI EMERG AHU #2	2-5747	OFF	ON	ON	ON	HIGH TEMP. IN ROOM THERMOSTAT	SR
	RESIN FEED TNK AGITATOR	2-1279-11B	OFF	OFF	OFF	OFF		NSR
	HPCI CLG WTR GLN SL COND PMP	2-2301-57	OFF	OFF	OFF	OFF		NSR
DVL	ALT FD DG RM HVAC SPLY FAN1	1-5727	OFF	OFF	OFF	OFF		SR
S&L	RX WTR CLNUP SYS RECIRC P&P 2B	2-1205B	TRIP	OFF	OFF	OFF	TRIP ON GROUP III	NSR
S&L	POST LOCA H2 O2 MON PMP 2B	2-252-81B	OFF	ON	ON	ON	MANUAL START AFTER LOCA	SR
S&L	ALT FD RHRS EMERG AHU 1B	1-5746B	OFF	OFF	OFF	OFF		SR
S&L	RWCU SYS RX-BOILER ISOL VLV	2-1201-80	START	OFF	OFF	OFF	CLOSES ON GROUP III	NSR
S&L							STROKES @ 100#. BETWEEN T=0 & RHR SW INITIATION	SR
	HPCI TURB STM SUP ISOL VLV	2-2301-4	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
	RHRS HT EXCH REV INLET VLV	2-1001-186B	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
S&L	CORE SPRAY OTBD ISOL VLV 2B	2-1402-24B	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
DVL/S&L							STARTS @ 325 PSI ASSUMED NON-COINCIDENT WITH VALVES STARTING @ 900 PSI	SR
	CORESPRY INBD ISOL VLV 2B	2-1402-25B	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
	RHRS HT EXCH REV NORM VLV	2-1001-185B	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
	RHRS HT EXCH REV OUT VLV	2-1001-187B	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
	RHRS HT EXCH NORM INL VLV	2-1001-4B	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
DVL	HPCI TK HTR		OFF	OFF	OFF	OFF	OIL TANK	SR
S&L							CLOSE ON OTHER UNIT. HIGH FAD ON GROUP II	SR
	RX BLDG VNT-SBGT SUP DMPR	2-7503	OFF	OFF	OFF	OFF	THERMOSTAT	SR
	STANDBY LQD CONT TK HTR	2-1103	ON	ON	ON	ON	ASSUMPTION 4	SR
	CLSD CLG WTR HDR ISOL VLV	2-3701	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
	CORESPRY PMP SUCT VLV 2B	2-1402-3B	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
S&L	CORESPRY TST BYPS VLV	2-1402-4A	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR

0/92



Preparer: *25/10/92* Concurrence: *(initials)*Date: *3-23-92*Concurrence: *DCB**3-24-92*

Date:

Load Center: MCC 29-2

Comments By	Load Name	Equipment Number	LOCA Time Zero	RHR SW Initiation	CR Sdby HVAC	Post LOCA Steady State	Remarks	SR or NSR
	RECIRC MG SET VENT FAN 2A	2A-5701	ON	ON	ON	ON		NSR
S&L	FX PROT M-G SET 2B		ON	ON	ON	ON	LOAD DROPS, SEE ASSUMPTION 9	NSR
S&L	DG STARTING AIR COMPR 2B	2-5209B	OFF	ON	ON	ON	STARTS SOON AFTER LOCA & CYCLES ON RECOVER PRESSURE	SR
	250VDC BATTERY CHARGER #2		ON	ON	ON	ON		SR
S&L	DG STARTING AIR COMPR 2A	2-5209A	OFF	ON	OFF	OFF	STARTS SOON AFTER LOCA & CYCLES ON RECOVER PRESSURE	SR
	125VDC BATTERY CHARGER #2		ON	ON	ON	ON		SR
	TURB BLDG EMERG LGTS		OFF	OFF	OFF	OFF		NSR
S&L	ALT FD DG1 CLG WTR PMP CLR FAN A&B		OFF	OFF	OFF	OFF		SR
	RHR SW PMP 2C CLR FAN A		OFF	START	ON	ON		SR
	RHR SW PMP 2C CLR FAN B		OFF	START	ON	ON		SR
	RHR SW PMP 2C CLR FAN C		OFF	START	ON	ON		SR
	RHR SW PMP 2C CLR FAN D		OFF	START	ON	ON		SR
S&L	DG2 CLG WTR PMP CLR FAN A		START	ON	ON	ON	STARTS ON DGCWP START	SR
S&L	DG2 CLG WTR PMP CLR FAN B		START	ON	ON	ON	STARTS ON DGCWP START	SR
	RHR SW PMP 2D CLR FAN A		OFF	START	ON	ON		SR
	RHR SW PMP 2D CLR FAN B		OFF	START	ON	ON		SR
	RHR SW PMP 2D CLR FAN C		OFF	START	ON	ON		SR
	RHR SW PMP 2D CLR FAN D		OFF	START	ON	ON		SR
	FX FD PMP VENT FAN 2B	2-5707B	ON	ON	ON	ON		NSR
	ACAD AIR COMPR	2-2501	OFF	OFF	OFF	OFF		SR

DIT NO. QC-EPED-0488-01

PROJ. NO. 8913-73

PAGE 8 OF 14

## Appendix A - Load Tables (Pre-Mods)

Station: Load Cities Units: 2

Preparer: *Tom Tuck* Concurrence: *OK* Date: *3/24/92* Concurrence: *DCB* *3/24/92* Date:

Load Center: MCC 29-3

Comments  
By

Load Name	Equipment Number	LOCA Time Zero	RHR SW Initiation	CR Sldby HVAC	Post LOCA Steady State	Remarks	SR or NSR
TURB BEARING LIFT PMP 2A	2-5620A	OFF	ON	ON	ON		NSR
TURB BEARING LIFT PMP 2B	2-5620B	OFF	ON	ON	ON		NSR
TURB BEARING LIFT PMP 2C	2-5620C	OFF	ON	ON	ON		NSR
TURB BEARING LIFT PMP 2D	2-5620D	OFF	ON	ON	ON		NSR
TURB BEARING LIFT PMP 2E	2-5620E	OFF	ON	ON	ON		NSR
TURBINE TURNING GEAR	2-5600	OFF	ON	ON	ON		NSR
TURB TURNING GEAR OIL PMP	2-5608	OFF	ON	ON	ON		NSR
DRYWELL CLG BLOWER 2E	2-5788E	ON	OFF	OFF	OFF	SECURED BY OPERATOR PRIOR TO INITIATING DRYWELL SPRAY	NSR
TURBINE TURNING GEAR PIGGYBACK MOTOR		OFF	ON	ON	ON		NSR

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DIT NO QC-EPUD-0458-01  
 PROJ. NO. 8913-73  
 PAGE 9 OF 14

184363

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

Date: 3-23-92 Concurrence:

DCB 3-24-92 Date:

Load Center: MCC 29-4

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	D-TYWEEL CLG BLOWER 2D	2-5734	ON	OFF	OFF	OFF	SECURED BY OPERATOR PRIOR TO INITIATING DRYWELL SPRAY	NSR
S&L	SBGT AIR HTRS	1/2-7503A	START	ON	ON	ON	START ON HI RAD OR GROUP II	SR
S&L	SBGT FAN	1/2-7506A	START	ON	ON	ON	START ON HI RAD OR GROUP II	SR
S&L	D-TYWEEL/TORUS DIFF PRESS COMP 2B	2-8740-1B	TRIP	OFF	OFF	OFF	TRIPS ON GROUP II ISOLATION OF SUCTION	NSR
S&L	SBGT OUTSD AIR SPLY DAMPER	1/2-7504A	START	OFF	OFF	OFF	START ON HI RAD OR GROUP II	SR
S&L	SBGT FAN DISCH DAMPER 1/2A	1/2-7507A	START	OFF	OFF	OFF	START ON HI RAD OR GROUP II	SR
S&L	SBGT SYS IN DAMPER 1/2A	1/2-7505A	START	OFF	OFF	OFF	START ON HI RAD OR GROUP II	SR
	RHRS CONT SPRY SHTOF ISOVLV	2-1001-26B	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 CONT SPRY VLV2B	2-1001-23B	OFF	ON	OFF	OFF	AS ABOVE	SR
S&L	RHRS MN SHTOF TO SPRN CH VLV	2-1001-34B	OFF	ON	OFF	OFF	AS ABOVE	SR
	RHRS SPRN CH DMPLN VLV 2B	2-1001-36B	OFF	ON	OFF	OFF	AS ABOVE	SR
	RHRS SPRN CH SPRY HDR VLV2B	2-1001-37B	OFF	OFF	OFF	OFF	4 OF 8 COULD BE ON AT TIME OF RHR SW INITIATION; LAST 4 ARBITRARILY TAKEN AS OFF	SR
S&L	RHRS CLG PMP DRS HDR VLV	2-1001-19B	OFF	OFF	OFF	OFF	AS ABOVE	SR
S&L	RHRS HT EXCH 1003B BYPS VLV	2-1001-16B	OFF	OFF	OFF	OFF	AS ABOVE	SR
S&L	RHRS CONT CLNT SERV WTR VLV	2-1001-5B	OFF	OFF	OFF	OFF	AS ABOVE	SR
	RHRS SHTDN CLG VLV 2C	2-1001-43C	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
	RHRS SHTDN CLG VLV 2D	2-1001-43D	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
	RHRS CLNT PMP SUCT HDR VLV	2-1001-7D	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
	RHRS CONT CLNT SERV WTR VLV	2-1001-5B	OFF	ON	OFF	OFF	SEE 2-1001-37B VALVE	SR
	RHRS CLNT PMP SUCT HDR VLV	2-1001-7C	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR

DIT NO. QC EP00-0488-01  
 PROJ. NO. 8913-73  
 PAGE NO. 10 OF 14

Preparer: *Joe [Signature]*Concurrence: *(11)*

Date: 3-23-92

Concurrence:

DCB 3-24-92

Date:

Load Center: MCC 28/29-5

Comments	Load Name	Equipment Number	LOCA Time Zero	RHR SW Initiation	CR Stdbby HVAC	Post LOCA Steady State	Remarks	SR or NSR
By S&L	RX WTR RECIRC LOOP EQUAL VALVE 2A	2-202-6A	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
S&L	RX WTR RECIRC PUMP SUCTION VALVE 2A	2-202-4A	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
S&L	RX WTR RECIRC PUMP DISCHG VALVE 2A	2-202-5A	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
S&L	RHRS INBD SHUTOFF VLV 2A	2-1001-29A	START	OFF	OFF	OFF	START AT 900 PSI	SR
S&L	RHRS OUTBD SHUTOFF VLV 2A	2-1001-28A	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
S&L	RX WTR RECIRC LOOP EQUAL BYPASS VALVE 2A	2-202-9A	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
S&L	RX WTR RECIRC LOOP EQUAL VALVE 2B	2-202-6B	START	OFF	OFF	OFF	START AT 900 PSI	SR
S&L	RX WTR RECIRC PMP SUCTION VALVE 2B	2-202-4B	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
S&L	RX WTR RECIRC PUMP DISCH VALVE 2B	2-202-5B	START	OFF	OFF	OFF	START AT 900 PSI	SR
S&L	RHRS INBD SHUTOFF VLV 2B	2-1001-29B	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR
S&L	RHRS OUTBD SHUTOFF VLV 2B	2-1001-28B	OFF	OFF	OFF	OFF	START AT 325 PSI ASSUMED NON-COINCIDENT WITH VALVES STARTING @ 900 PSI	SR
S&L	RX WTR RECIRC LOOP EQUAL BYPASS VALVE 2B	2-202-9B	OFF	OFF	OFF	OFF	ASSUMPTION 4	SR

DIT NO. QC-EPUD-6488-01

PROJ. NO. 8913-73

PAGE 11 OF 14

Appendix A - Load Tables (Pre-Mode)

Station: ad Cities Units: 2

Preparer: *AS* Concurrency: *(M)* Date: *3-22-92* Concurrency: *OCB* *3-24-92* Date:

Load Center: MCC 29-8

Comments By	Load Name	Equipment Number	LOCA Time Zero	RHR SW Initiation	CR Sdby HVAC	Post LOCA Steady State	Remarks	SR or NSR
S&L	DRYWELL CLG BLOWER 20	2-5734G	ON	OFF	OFF	OFF	SECURED BY OPERATOR PRIOR TO INITIATING DRYWELL SPRAY	NSR
S&L	DRYWELL CLG BLOWER 20	2-5734C	ON	OFF	OFF	OFF	SECURED BY OPERATOR PRIOR TO INITIATING DRYWELL SPRAY-	NSR

DIT NO. QC-EPED-0488-01  
PROJ. NO. 8913-73  
PAGE 12 OF 14.



184363

March 23, 1992  
In Reply, Refer to

CHRON # 182875

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:

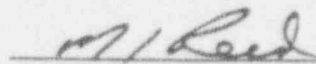


M.S. Tucker  
Senior Engineer

Date:

3/23/92

Approved:



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

DIT No: QC-EPED-0488-01

PROJECT No: 8913-73

PAGE 13 OF 14



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 ✗

DIT No: QC-EPED-0488-01

PROJECT No: 8413-73

PAGE 14 OF 14

184363

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ENGINEERS

Calc. For Quad Cities 2/II Safety-related Continuous	
Load Running/Starting Voltages	
<input checked="" type="checkbox"/> Safety-Related	<input type="checkbox"/> Non-Safety-Related

Calc. No. 8913-73-19-1	
Rev. 0	Date 4/1/92
Page 1	of 25

Client	Commonwealth Edison Company
Project	Quad Cities Unit 2
Proj. No. 8913-73	Equip. No.

Prepared by	<i>John A. Gussner</i>	Date	4-14-92
Reviewed by	<i>Paul A. Gussner</i>	Date	7-1-92
Approved by	<i>AT Schmitt</i>	Date	4/1/92

# I. ISSUE SUMMARY

Revision 0, Initial Issue, Page 1 through 25, A1 through A73, and B1 through B18.

184363

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Calc. For Quad Cities 2/II Safety-related Continuous	
Load Running/Starting Voltages	
<input checked="" type="checkbox"/> Safety-Related	<input type="checkbox"/> Non-Safety-Related

Calc. No. 8913-73-19-1	
Rev. 0	Date
Page 2	of 25

Client	Commonwealth Edison Company
Project	Quad Cities Unit 2
Proj. No.	8913-73
Equip. No.	

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. Law*

DATE:

*4/14/92*

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Calc. For Quad Cities 2/II Safety-related Continuous

Load Running/Starting Voltages

X

Safety-Related

Non-Safety-Related

Calc. No. 8913-73-19-1

Rev. 0

Date

Page 3

of 25

Client	Commonwealth Edison Company
Project	Quad Cities Unit 2
Proj. No.	8913-73
Equip. No.	

Prepared by	Date
Reviewed by	Date
Approved by	Date

### III. PURPOSE

The purpose of this calculation is to evaluate the terminal voltage of all safety-related services at Unit 2, Division II for the following operating cases:

#### Case A

With the 4.16 KV bus 24-1 voltage at 3820 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 24-1 voltage at 3820 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 Valve, control circuit, 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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Calc. For Quad Cities 2/11 Safety-related Continuous

Load Running/Starting Voltages

X Safety-Related

Non-Safety-Related

Calc. No. 8913-73-19-1

Rev. 0

Date

Page 4 of 25

Client Commonwealth Edison Company

Project Quad Cities Unit 2

Proj. No. 8913-73

Equip. No.

Prepared by

Date

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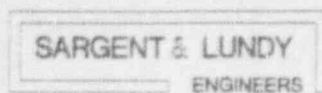
Date

Approved by

Date

#### IV. TABLE OF CONTENTS

<u>Section</u>	<u>Description</u>	<u>Pages</u>
I.	ISSUE SUMMARY	1
II.	PURPOSE	2
III.	METHOD OF REVIEW	3
IV.	TABLE OF CONTENTS	4
V.	REFERENCES	5
VI.	INPUT DATA	7
VII.	ASSUMPTIONS	8
VIII.	ACCEPTANCE CRITERIA	11
IX.	METHODOLOGY	12
X.	CALCULATION	15
XI.	COMPARISON OF CALCULATED RESULTS WITH ACCEPTANCE CRITERIA	23
XII.	CONCLUSIONS	25
XIII.	RECOMMENDATIONS	25
Appendices		
A - Case A		
	Running Voltage Evaluation	A1-A73
B - Case B		
	Block Motor Starting Evaluation	B1-B18



Calc. For Quad Cities 2/II Safety-related Continuous	
Load Running/Starting Voltages	
X	Safety-Related
	Non-Safety-Related

Calc. No. 8913-73-19-1	
Rev. 0	Date
Page 5	of 25

Client	Commonwealth Edison Company
Project	Quad Cities Unit 2
Proj. No.	8913-73
Equip. No.	

Prepared by	Date
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Approved by	Date

## V. REFERENCES

- A. Sargent & Lundy (S&L) Design Information Transmittal (DIT) No. QC-EPED-0488-01, dated 3-26-92.
  - . Load Tables and Assumptions and Load Shedding List for Division II, Unit 2.
- B. S&L DIT No. QC-EPED-0459-01, dated 4-9-92.
  - . Safety Related Service Feed Cable Data
- C. S&L DIT No. QC-EPED-0472-02, dated 4-9-92.
  - . Additional S/R Service Feed Cable Data
- D. S&L DIT No. QC-EPED-0491-02, 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. Fanafax 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-529-00, dated 3-25-92.
  - . This DIT transmitted the current computer data file for QUAD CITIES Unit 2 ELMS-AC analysis to be used as the 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 12, "Tests and Performance - AC Small and Medium Motors"



184363

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Calc. For Quad Cities 2/II Safety-related Continuous			
Load Running/Starting Voltages			
X	Safety-Related		Non-Safety-Related

Calc. No. 8913-73-19-1	
Rev. 0	Date
Page 6	of 25

Client	Commonwealth Edison Company
Project	Quad Cities Unit 2
Proj. No.	8913-73 Equip. No.

Prepared by	Date
Reviewed by	Date
Approved by	Date

# V. REFERENCES (Continued)

- . Running Voltage and Locked Rotor Torque Requirements for Motors
- L. S&L DIT No. QC-EPED-0530-00, dated 3-25-92
  - . Cable Length and Size of Feeders from Switchgear 29 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 SBT Fan Motor.
- R. S&L DIT No. QC-EPED-0532-00, dated 3-26-92
  - . Field Walk-down Data for DG Cooling Water Pump Cooler Fans.
- S. Telephone Memorandum, between S. Gaconis (CECo) and W.G. Bloethe (S&L), dated 4-1-92
  - . Comments on Preliminary Version of this Calculation by CECO.
- 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

184363

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Calc. For Quad Cities 2/11 Safety-related Continuous	
Load Running/Starting Voltages	
X	Safety-Related
	Non-Safety-Related

Calc. No. 8913-73-19-1	
Rev. 0	Date
Page 7	of 25

Client	Commonwealth Edison Company
Project	Quad Cities Unit #2
Proj. No.	8913-73
Equip. No.	

Prepared by	Date
Reviewed by	Date
Approved by	Date

## 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
CR123C3.01A	0.355
CR123C4.66A	0.084
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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Calc. For Quad Cities 2/II Safety-related Continuous	
Load Running/Starting Voltages	
X	Safety-Related
	Non-Safety-Related

Calc. No. 8913-73-19-1	
Rev. 0	Date
Page 8	of 25

Client	Commonwealth Edison Company
Project	Quad Cities Unit 2
Proj. No.	8913-73 Equip. No.

Prepared by	Date
Reviewed by	Date
Approved by	Date

## 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% 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 2, 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 operating

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Calc. For Quad Cities 2/II Safety-related Continuous	
Load Running/Starting Voltages	
X	Safety-Related
	Non-Safety-Related

Calc. No. 8913-73-19-1	
Rev. 0	Date
Page 9 of 25	

Client	Commonwealth Edison Company		
Project	Quad Cities Unit 2		
Proj. No.	8913-73	Equip. No.	

Prepared by	Date
Reviewed by	Date
Approved by	Date

VII. ASSUMPTIONS (continued)

simultaneously during the period that the incoming motors are starting. This is confirmed by CECO in Reference V.S, 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 C0.48A. 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. The following data are assumed for the Diesel Generator Cooling Water Pump 2 (Switchgear 29), and verification is required.
  - Power Factor 86%
  - Starting Power Factor 41%
  - Locked Rotor Current 615%
  - Efficiency 100%
  - Minimum Starting Voltage 75% of rated

184363

SARGENT & LUNDY  
ENGINEERS

Calc. For Quad Cities 2/11 Safety-related Continuous

Load Running/Starting Voltages

X Safety-Related

Non-Safety-Related

Calc. No. 8913-73-19-1

Rev. 0

Date

Page 10 of 25

Client Commonwealth Edison Company

Project Quad Cities Unit 2

Proj. No. 8913-73

Equip. No.

Prepared by

Date

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Date

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Date

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.
- I. The RHRS CONT CLNT SERVICE WATER VALVE (Eq. No. 2-1001-5B) on MCC 29-4 is assumed OFF for all four operating conditions. This assumption is to be verified.

184363

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Calc. For Quad Cities 2/11 Safety-related Continuous

Calc. No. 8913-73-19-1

Load Running/Starting Voltages

Rev. 0

Date

☒ Safety-Related☐ Non-Safety-Related

Page 11 of 25

Client Commonwealth Edison Company

Project Quad Cities Unit 2

Proj. No. 8913-73

Equip. No.

Prepared by

Date

Reviewed by

Date

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Date

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 a minimum starting voltage of 75% of rated:

- |                                       |                    |
|---------------------------------------|--------------------|
| 1. SBTG FAN                           | (Reference V.Q)    |
| 2. DG CLG WATER PUMP 2                | (Assumption VII.G) |
| 3. DG CLG WATER PUMP COOLER FAN A & B | (Reference V.T)    |



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Calc. For Quad Cities 2/II Safety-related Continuous

Load Running/Starting Voltages

X Safety-Related

Non-Safety-Related

Calc. No. 8913-73-19-1

Rev. 0

Date

Page 12 of 25

Client Commonwealth Edison Company

Project Quad Cities Unit 2

Proj. No. 8913-73

Equip. No.

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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. The calculation is performed by using Program ELMS-AC, Version 2.2. The Existing ELMS-AC Data File Q2A4.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 Q2A4.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 24-1 valid for all four conditions in the file. Adjust the source 3 voltage such that the voltage at 4.16 KV Switchgear 24-1 is kept at 3820 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: 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 CEC'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 CEC's Load Table and Load Shedding List (Reference V.A), with the brake horsepower determined in the following order of preference:

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Calc. For Quad Cities 2/11 Safety-related Continuous

Load Running/Starting Voltages

X Safety-Related

Non-Safety-Related

Calc. No. 8913-73-19-1

Rev. 0

Date

Page 13 of 25

Client	Commonwealth Edison Company	*
Project	Quad Cities Unit 2	
Proj. No.	8913-73	Equip. No.

Prepared by	Date
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Approved by	Date

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 the Assumption VII.G.
- . 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 29 to each down-stream MCC.
- . Change the rated HP of DG Cooling Water Pump Cooler Fan A & B according to the field walk-down data (Reference V.R)
- . Add load TURBINE TURNING GEAR PIGGY BACK MOTOR to MCC 29-3 in the ELMS-AC file.

184363

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Calc. For Quad Cities 2/11 Safety-related Continuous	
Load Running/Starting Voltages	
X	Safety-Related
	Non-Safety-Related

Calc. No. 8913-73-19-1	
Rev. 0	Date
Page 14 of 25	

Client	Commonwealth Edison Company	
Project	Quad Cities Unit 2	
Proj. No.	8913-73	Equip. No.

Prepared by	Date
Reviewed by	Date
Approved by	Date

IX. METHODOLOGY (Continued)

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

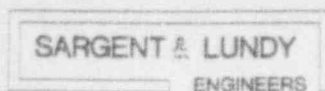
There are eight identical RHR SW Pump Cooler Fans fed from MCC 29-2 through AWG #10 cable. They are block started on Condition 2 in CECO Load Table. To avoid redundancy, only the terminal bus for the motor with longest feed cable length (in this case Pump 2C Cooler Fan A) is modeled in the program to 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 24-1 voltage is set at 3820 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.

184363



Calc. For Quad Cities 2/11 Safety-related Continuous	
Load Running/Starting Voltages	
X	Safety-Related
	Non-Safety Related

Calc. No. 8913-73-19-1	
Rev. 0	Date
Page 15	of 25

Client	Commonwealth Edison Company
Project	Quad Cities Unit 2
Proj. No.	8913-73
Equip. No.	

Prepared by	Date
Reviewed by	Date
Approved by	Date

## 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 =  $1.732 \times 480 \times 113 = 93.9$  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. Performance of Diesel Generator Cooling Water Pump 2.

From the existing ELMS-AC file, for the Diesel Generator Cooling Water Pump,

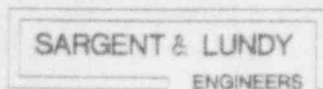
Rated Voltage: 460 V  
 Rated Speed: 3550 rpm  
 Rated Horsepower: 100

In Assumption VII.G, the following data are assumed for the Diesel Generator Cooling Water Pump 2, and these assumed values are to be verified:

Brake Power = 90 HP  
 Power Factor = 86%  
 Efficiency = 100%  
 Starting Power Factor = 41%  
 Locked Rotor Current = 615%  
 Minimum Starting Voltage = 75 % of rated

### 3. Calculation of MCC Feed Cable Impedances.

Based on Reference V.L, the feed cable impedance from Switchgear 29 to down-stream MCC's are calculated in the Table 1:



Calc. For Quad Cities 2/11 Safety-related Continuous	
Load Running/Starting Voltages	
X	Safety-Related
	Non-Safety-Related

Calc. No. 8913-73-19-1	
Rev. 0	Date
Page 16	of 25

Client	Commonwealth Edison Company
Project	Quad Cities Unit #2
Proj. No.	8913-73
Equip. No.	

Prepared by	Date
Reviewed by	Date
Approved by	Date

# X. CALCULATION (Continued)

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

From Bus	To Bus	Cable Size	Cable Length (ft)	Total Resistance	Total Reactance
SWGR 29	MCC 29-1	250 MCM	261	0.0141462	0.0071253
SWGR 29	MCC 29-2	250 MCM	289	0.0156638	0.0078897
SWGR 29	MCC 29-3	250 MCM	287	0.0155554	0.0078351
SWGR 29	MCC 29-4	250 MCM	252	0.0136584	0.0068796
SWGR 29	MCC 28/9-5	250 MCM	286	0.0155012	0.0078078
SWGR 29	MCC 29-6	350 MCM	286	0.0111254	0.0076076

## 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).

$$\text{Rated HP} = (1.732 * 0.44 * 2.7 * 0.6 * 0.85) / 0.746 = 1.4$$

## 5. Calculation of Safety-related Service Feeder Impedance

For the loads given in References V.B and V.C as the safety-related services in Division II, 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 and V.C are tabulated in Table 2, with total feeder impedance calculated.







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Calc. For Quad Cities 2/11 Safety-related Continuous

Load Running/Starting Voltages

X

Safety-Related

Non-Safety-Related

Calc. No. 8913-73-19-1

Rev. 0

Date

Page 18

of 25

Client Commonwealth Edison Company

Project Quad Cities Unit 2

Proj. No. 8913-73

Equip. No.

Prepared by

Date

Reviewed by

Date

Approved by

Date

## X. CALCULATION (Continued)

### 6. 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 3/4 is the worst loading scenario that requires the highest 4.16 KV bus voltage. Therefore, condition 3/4 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's 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 2.1/2.2 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:

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

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

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Calc. For Quad Cities 2/11 Safety-related Continuous	
Load Running/Starting Voltages	
X	Safety-Related
	Non-Safety-Related

Calc. No. 8913-73-19-1	
Rev. 0	Date
Page 19	of 25

Client	Commonwealth Edison Company
Project	Quad Cities Unit 2
Proj. No. 8913-73	Equip. No.

Prepared by	Date
Reviewed by	Date
Approved by	Date

# 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:

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

The adjusted 'R' type load values are tabulated in Table 2. 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 3/4 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 3/4 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 used as limiting cases to determine the 4.16 KV bus voltage. (Reference V.A).

184363

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Calc. For Quad Cities 2/11 Safety-related Continuous

Load Running/Starting Voltages

X Safety-Related

Non-Safety-Related

Calc. No. 8913-73-19-1

Rev. 0

Date

Page 20

of 25

Client Commonwealth Edison Company

Project Quad Cities Unit 2

Proj. No. 8913-73

Equip. No.

Prepared by

Date

Reviewed by

Date

Approved by

Date

X. CALCULATION (Continued)

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

Load Name	ELMS-Load No.	Rated KVA	Load Rated Volts	SWGR /MCC No	MCC Volt.	New KVA
RX Bldg Lighting 2	514	108	480	29	435.9	89.1
120/208V Xfmr Feed 29-1-1	522	15	480	29-1	431.0	12.1
Standby Lqd Cont Tank Htr	544	60	480	29-1	431.0	48.4
250 V Battery Charger 2	551	93.9	480	29-2	426.8	83.5
125 V Battery Charger 2	553	39.9	480	29-2	426.8	35.5
SBGT Air Heaters	577	30	480	29-4	434.4	24.6

184363

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ENGINEERS

Calc. For Quad Cities 2/11 Safety-related Continuous

Calc. No. 8913-73-19-1

Load Running/Starting Voltages

Rev. 0

Date

X

Safety-Related

Non-Safety-Related

Page 21

of 25

Client Commonwealth Edison Company

Project Quad Cities Unit 2

Proj. No. 8913-73

Equip. No.

Prepared by

Date

Reviewed by

Date

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Date

X. CALCULATION (Continued)10. 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 24-1 is to be kept at 3820 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 2 (@ SWGR 29)
2. RWCU SYS RX-BOILER ISOL VLV (@ MCC 29-1)
3. DG2 CLG WTR PMP COOLER FAN A (@ MCC 29-2)
4. DG2 CLG WTR PMP COOLER FAN B (@ MCC 29-2)
5. STANDBY GAS TREATMENT FAN (@ MCC 29-4)
6. SBTG OUTSIDE AIR SUPPLY DAMPER (@ MCC 29-4)
7. SBTG SYS FAN DISCH DAMPER 1/2A (@ MCC 29-4)
8. SBTG SYS INLET DAMPERS 1/2A (@ MCC 28/29-5)
9. RHRS INBOARD SHUTOFF VLV 2A (@ MCC 28/29-5)
10. RX WTR RECIRC LOOP EQUAL VLV 2B (@ MCC 28/29-5)
11. RX WTR RECIRC PMP DISCH VLV 2B (@ MCC 28/29-5)

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

1. RHR SW Pump 2C Cooler Fan A (@ MCC 29-2)
2. RHR SW Pump 2C Cooler Fan B (@ MCC 29-2)
3. RHR SW Pump 2C Cooler Fan C (@ MCC 29-2)
4. RHR SW Pump 2C Cooler Fan D (@ MCC 29-2)
5. RHR SW Pump 2D Cooler Fan A (@ MCC 29-2)
6. RHR SW Pump 2D Cooler Fan B (@ MCC 29-2)
7. RHR SW Pump 2D Cooler Fan C (@ MCC 29-2)
8. RHR SW Pump 2D Cooler Fan D (@ MCC 29-2)
9. RHRS CONT SPRY SHTOF ISOL VLV (@ MCC 29-4)
10. RHRS BACKUP CONT SPRY VLV 2B (@ MCC 29-4)
11. RHRS SPRN CH DMPLN VLV 2B (@ MCC 29-4)
12. RHR MN SHTOF TO SPRN CH VLV (@ MCC 29-4)

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Calc. For Quad Cities 2/II Safety-related Continuous

Load Running/Starting Voltages

X Safety-Related

Non-Safety-Related

Calc. No. 8913-73-19-1

Rev. 0

Date

Page 22

of 25

Client Commonwealth Edison Company

Project Quad Cities Unit 2

Proj. No. 8913-73

Equip. No.

Prepared by

Date

Reviewed by

Date

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Date

# X. CALCULATION (Continued)

Among the first eight identical motors, due to the feed cable length, the RHR SW Pump 2C 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.	Rated KVA	Load Rated Volts	SWGR /MCC No	Condition 1		Condition 2	
					MCC V	KVA	MCC V	KVA
Rx Bldg Lighting 2	514	108	480	29	415.1	80.8	430.1	86.7
120/208V Xfmr Feed 29-1-1	522	15	480	29-1	412.8	11.1	425.3	11.8
Standby Lqd Cont Tank Htr	544	60	480	29-1	412.8	44.4	425.3	47.1
250 V Battery Charger 2	551	93.9	480	29-2	406.5	79.5	416.3	81.4
125 V Battery Charger 2	553	39.9	480	29-2	406.5	33.8	416.3	34.6
SBGT Air Heaters	577	30	480	29-4	410.6	22.0	427.0	23.7

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Calc. For Quad Cities 2/11 Safety-related Continuous

Load Running/Starting Voltages

X Safety-Related

Non-Safety-Related

Calc. No. 8913-73-19-1

Rev. 0

Date

Page 23 of 25

Client Commonwealth Edison Company

Project Quad Cities Unit 2

Proj. No. 8913-73

Equip. No.

Prepared by

Date

Reviewed by

Date

Approved by

Date

# 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 24-1	4160	3820.0	--	--	--
DG HVAC Supply Fan 2	460	400.7	414.0	29-1	431.0
RHRS Emer. AHU 2B	460	412.0	414.0	29-1	431.0
Core Spray Emerg. AHU 2B	460	416.8	414.0	29-1	431.0
DG Oil Xfer Pump	460	417.0	414.0	29-1	431.0
DG Clg Wtr Pmp Clr Fans	460	417.1	414.0	29-2	426.8

It should be noted that the following loads have running voltage below the acceptance criteria:

1. DG HVAC Supply Fan 2
2. RHRS Emergency Air Handling Unit 2B



184363

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Calc. For Quad Cities 2/11 Safety-related Continuous

Load Running/Starting Voltages

X

Safety-Related

Non-Safety-Related

Calc. No. 8913-73-19-1

Rev. 0

Date

Page 24

of 25

Client	Commonwealth Edison Company
Project	Quad Cities Unit 2
Proj. No.	8913-73
Equip. No.	

Prepared by	Date
Reviewed by	Date
Approved by	Date

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  
(3820.0 V at Switchgear 24-1)

Limiting Motor Load Name	Starting Condition	MCC Voltage (MCC No)	Starting Voltage	
			Terminal	Accept. V
DG Cooling Water Pump 2	LOCA Time Zero	415.1 (29)	361.7 V (78.6%)	345 (75%)
SBGT Fan	LOCA Time Zero	410.6 (29-4)	368.5 V (80.1%)	345 (75%)
DG Clg Wtr Pmp Clr Fan A/B	LOCA Time Zero	406.5 (29-2)	356.3 V (77.5%)	345 (75%)
RHRS SW Pump 2C Clr Fan A	RHRS Initiation	416.3 (29-2)	394.7 V (85.8%)	391 (85%)

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

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Calc. For Quad Cities 2/II Safety-related Continuous	
Load Running/Starting Voltages	
<input checked="" type="checkbox"/> Safety-Related	<input type="checkbox"/> Non-Safety-Related

Calc. No. 8913-73-19-1	
Rev. 0	Date
Page 25	of 25

Client	Commonwealth Edison Company
Project	Quad Cities Unit 2
Proj. No. 8913-73	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 3820 Volts at the 4.16 KV Switchgear 24-1, for the safety related 480 V system loads in Quad Cities Unit 2, 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, however, two of the safety-related loads do not meet the 90% running voltage criteria. These two loads are:

1. Diesel Generator HVAC Supply Fan 2 (87.1 %)
2. RHRS Emergency AHU 2B (89.6 %)

XIII. RECOMMENDATIONS

Not applicable due to the scope of this calculation.

184363

SARGENT & LUNDY  
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Calc. For Quad Cities 2/11 Safety-related Continuous	
Load Running/Starting Voltages	
<input checked="" type="checkbox"/>	Safety-Related
<input type="checkbox"/>	Non-Safety-Related

Calc. No. 8913-73-19-1  
Rev. 2  
Project No. 8913-73  
Page H1 of

Client	Commonwealth Edison Company	
Project	Quad Cities Unit 2	
Proj. No.	8913-73	Equip. No.

Prepared by	Date
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Approved by	Date

APPENDIX A  
CASE A COMPUTER PRINTOUTS  
( RUNNING VOLTAGE EVALUATION)

184363

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Calc. For Quad Cities 2/11 Safety-related Continuous

Load Running/Starting Voltages

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page A2 of

X

Safety-Related

Non-Safety-Related

Client	Commonwealth Edison Company
Project	Quad Cities Unit 2
Proj. No.	8913-73 Equip. No.

Prepared by	Date
Reviewed by	Date
Approved by	Date

Listed in the following order:

File: Z3.DAT

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

184363

Calc. No. 8913-73-1

Rev. 0

Project No. 8913-73

Page 43 of

## AC Electrical Load Monitoring System Ver 2.20

Sargent &amp; Lundy Engineers

Chicago, Ill.

Date : 3-28-92

Utility : Sargent & Lundy Internal Use  
 Station : QUAD CITIES-FILE:23.DAT

Proj. No. : 8913-73  
 Unit : 2

## \*\*\* Bus Data \*\*\*

Rec #	Bus Name	Bus Voltage	Class 1E	SC Amps	Valid Sources	Swgr MVA	Maximum Volts	K Fact	Inter. Cycles	Trip Del	Source Data				
											Min Run Volts	Max SC MVA	SC X/R V (PU)	Preflt	
1	GENERATOR 2	18000.0	N	500000.		15000.	18900.0	1.00	5	Sym	.0	17100.0	10479.0	72.0	1.050
This source is valid for condition(s)															
2	345KV SWITCH YARD	345000.0	N	50000.		30000.	362000.0	1.00	5	Sym	.0	349000.0	14000.0	10.0	1.050
This source is valid for condition(s)															
3	Equivalent Source	4160.0	Y	99999.		250.	4760.0	1.24	5	Sym	.0	3797.0	99999.0	20.0	1.000
This source is valid for condition(s) 1 2 3 4															
4	UAT 21 INTERNAL BUS	18000.0	N	500000.	1	15000.	18900.0	1.00	5	Sym	.0				
5	180KV DUMMY BUS	180000.0	N	50000.	2	30000.	200000.0	1.00	5	Sym	.0				
6	X WINDG IMAGINRY BUS	4160.0	N	29000.	1	250.	4760.0	1.24	5	Sym	.0				
7	Y WINDG IMAGINRY BUS	4160.0	N	42474.	1	350.	4760.0	1.19	5	T C	.0				
8	Y WINDING BUS 8	4160.0	N	42474.	2	350.	4760.0	1.19	5	T C	.0				
9	X WINDING BUS 6	4160.0	N	29000.	2	250.	4760.0	1.24	5	Sym	.0				
10	4KV SWGR 21	4160.0	N	42474.	1 2	350.	4760.0	1.19	5	T C	.0				
11	4KV SWGR 22	4160.0	N	42474.	1 2	350.	4760.0	1.19	5	T C	.0				
12	4KV SWGR 23	4160.0	Y	29000.	1 2	250.	4760.0	1.24	5	Sym	.0				
13	4KV SWGR 24	4160.0	Y	29000.	1 2	250.	4760.0	1.24	5	Sym	.0				
14	4KV SWGR 23-1	4160.0	Y	29000.	1 2	250.	4760.0	1.24	5	Sym	.0				
15	4KV SWGR 24-1	4160.0	Y	29000.	3	250.	4760.0	1.24	5	Sym	.0				
16	DIESEL GENERATOR 2	4160.0	Y	29000.	1 2	250.	4760.0	1.24	5	Sym	.0				
17	DIESEL GENERATOR 1/2	4160.0	Y	29000.	1 2	250.	4760.0	1.24	5	Sym	.0				
18	HIGH SIDE OF XFMR 25	4160.0	N	29000.	1 2	250.	4760.0	1.24	5	Sym	.0				
19	480V SWGR 25	480.0	N	22000.	1 2										
20	HIGH SIDE OF XFMR 20	4160.0	N	29000.	1 2	250.	4760.0	1.24	5	Sym	.0				
21	480V MCC 20-1	480.0	N	14000.	1 2										
22	HIGH SIDE OF XFMR 26	4160.0	N	29000.	1 2	250.	4760.0	1.24	5	Sym	.0				

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

Calc. No. 8913-73-14-1

Rev. 0

Project No. 8913-73

Page 44 of

Date : 3-28-92

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

## \*\*\* Bus Data \*\*\*

Rec #	Bus Name	Bus Class			Valid Sources	Swgr MVA	Maximum Volts	K Fact	Inter. Trip Cycles Del	Source Data		
		Voltage	1E	SC Amps						Min Run Volts	Max SC MVA	SC Prefit X/R V (PU)
23	480V SWGR 26	480.0	N	22000.	1 2							
24	HIGH SIDE OF XFMR 27	4160.0	N	29000.	1 2	250.	4760.0	1.24	5 Sym	.0		
25	480V SWGR 27	480.0	N	22000.	1 2							
26	HIGH SIDE OF XFMR 28	4160.0	Y	29000.	1 2	250.	4760.0	1.24	5 Sym	.0		
27	480V SWGR 28	480.0	Y	22000.	1 2							
28	HIGH SIDE OF XFMR 29	4160.0	Y	29000.	3	250.	4760.0	1.24	5 Sym	.0		
29	480V SWGR 29	480.0	Y	22000.	3							
30	HIGH SIDE OF XFMR 2A	4160.0	N	29000.	1 2	250.	4760.0	1.24	5 Sym	.0		
31	480V MCC 2A-1	480.0	N	25000.	1 2							
32	480V MCC 25-1	480.0	N	14000.	1 2							
33	480V MCC 25-2	480.0	N	14000.	1 2							
34	480V MCC 25-3	480.0	N	14000.	1 2							
35	480V MCC 25-6	480.0	N	14000.	1 2							
36	480V HRSS BLDG MCC	480.0	N	14000.	1 2							
37	480V MCC 16/26-1	480.0	N	14000.	1 2							
38	480V MCC 26-2	480.0	N	14000.	1 2							
39	480V MCC 26-3	480.0	N	14000.	1 2							
40	480V MCC 16/26-4	480.0	N	14000.	1 2							
41	480V MCC 16/26-5	480.0	N	14000.	1 2							
42	480V MCC 16/26-6	480.0	N	14000.	1 2							
43	480V MCC 27-1	480.0	N	14000.	1 2							
44	480V MCC 27-2	480.0	N	14000.	1 2							







Date : 3-28-92

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

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page R7 of

184363

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:23.DAT

Proj. No. : 8913-73  
Unit : 2

\*\*\* Bus Data \*\*\*

Rec #	Bus Name	Bus Class			Valid Sources	Swgr MVA	Maximum Volts	K Fact	Inter. Trip Cycles Del	Source Data			
		Voltage	1E	SC Amps						Min Run Volts	Max SC MVA	SC X/R	Preflt V (PU)
89	LOAD 561 TERM	480.0	Y	14000.	3								
90	LOAD 567 TERM	480.0	Y	14000.	3								
91	LOAD 556 TERM	480.0	Y	14000.	3								
92	LOAD 577 TERM	480.0	Y	14000.	3								
93	LOAD 578 TERM	480.0	Y	14000.	3								
94	LOAD 580 TERM	480.0	Y	14000.	3								
95	LOAD 581 TERM	480.0	Y	14000.	3								
96	LOAD 582 TERM	480.0	Y	14000.	3								
97	LOAD 527 TERM	480.0	Y	14000.	3								

Date : 04-13-92

## AC Electrical Load Monitoring System Ver 2.20

Sargent & Lundy Engineers  
Chicago, Ill.

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page AB of

184363

Utility : Sargent &amp; Lundy Internal Use

Proj. No. : 8913-73

Station : QUAD CITIES-FILE:23.DAT

Unit : 2

## \*\*\* Connection Data \*\*\*

From	To	Rating	Cable R (ohms)	X (ohms)	% Imp OA Base	% Imp Tol	OA kVA	X/R Ratio	Tap Ratio
GENERATOR 2	UAT 21 INTERNAL BUS	1553.0 Amps	.0018515	.0370347					
UAT 21 INTERNAL BUS	X WINDG IMAGINRY BUS	19000.0 kVA			15.769	00.0	27600.0	20.0	.950
UAT 21 INTERNAL BUS	Y WINDG IMAGINRY BUS	27000.0 kVA			11.858	00.0	27600.0	20.0	.950
Y WINDG IMAGINRY BUS	4KV SWGR 22	4000.0 Amps	.0010000	.0000000					
Y WINDG IMAGINRY BUS	4KV SWGR 21	4000.0 Amps	.0010000	.0005220					
X WINDG IMAGINRY BUS	4KV SWGR 24	3000.0 Amps	.0010000	.0000000					
X WINDG IMAGINRY BUS	4KV SWGR 23	3000.0 Amps	.0010000	.0007938					
345KV SWITCH YARD	180KV DUMMY BUS	46000.0 kVA			-1.290	00.0	27600.0	25.0	.975
180KV DUMMY BUS	X WINDING BUS 6	19000.0 kVA			16.830	00.0	27600.0	25.0	.975
180KV DUMMY BUS	Y WINDING BUS 8	27000.0 kVA			13.620	00.0	27600.0	25.0	.975
X WINDING BUS 6	4KV SWGR 23	3000.0 Amps	.0010000	.0007938					
WINDING BUS 6	4KV SWGR 24	3000.0 Amps	.0010000	.0000000					
WINDING BUS 8	4KV SWGR 21	4000.0 Amps	.0010000	.0005220					
WINDING BUS 8	4KV SWGR 22	4000.0 Amps	.0010000	.0000000					
4KV SWGR 23	4KV SWGR 23-1	680.0 Amps	.0054144	.0114304					
4KV SWGR 23-1	DIESEL GENERATOR 1/2	600.0 Amps	.0087500	.0155000					

Date : 04-13-92

## AC Electrical Load Monitoring System Ver 2.20

Sargent & Lundy Engineers  
Chicago, Ill.

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page 09 of

184363

Utility : Sargent &amp; Lundy Internal Use

Proj. No. : 8913-73

Station : QUAD CITIES-FILE:23.DAT

Unit : 2

## \*\*\* Connection Data \*\*\*

From	To	Rating	Cable R (ohms)	X (ohms)	% Imp OA Base	% Imp Tol	X/R OA kVA	Tap Ratio	Ratio
4KV SWGR 24	4KV SWGR 24-1	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					
4KV SWGR 23-1	HIGH SIDE OF XFMR 28	390.0 Amps	.0050875	.0059385					
4KV SWGR 23	HIGH SIDE OF XFMR 25	390.0 Amps	.0041250	.0048150					
4KV SWGR 23-1	HIGH SIDE OF XFMR 20	220.0 Amps	.0555930	.0311460					
4KV SWGR 24	HIGH SIDE OF XFMR 26	390.0 Amps	.0102300	.0119412					
4KV SWGR 24	HIGH SIDE OF XFMR 27	390.0 Amps	.0209550	.0244602					
4KV SWGR 23	HIGH SIDE OF XFMR 2A	220.0 Amps	.0472860	.0264920					
HIGH SIDE OF XFMR 28 480V SWGR 28		1680.0 kVA			11.340	00.0	1500.0	8.4	.975
HIGH SIDE OF XFMR 29 480V SWGR 29		1680.0 kVA			11.300	00.0	1300.0	8.4	.975
HIGH SIDE OF XFMR 20 480V MCC 20-1		500.0 kVA			4.700	00.0	500.0	3.8	.975
HIGH SIDE OF XFMR 2A 480V MCC 2A-1		750.0 kVA			5.460	00.0	750.0	3.2	.975
HIGH SIDE OF XFMR 27 480V SWGR 27		1680.0 kVA			11.340	00.0	1500.0	8.4	.975
HIGH SIDE OF XFMR 26 480V SWGR 26		1680.0 kVA			11.300	00.0	1500.0	8.4	.975
HIGH SIDE OF XFMR 25 480V SWGR 25		1680.0 kVA			11.300	00.0	1500.0	8.4	.975

Date : 04-13-92

## AC Electrical Load Monitoring System Ver 2.20

Sargent & Lundy Engineers  
Chicago, Ill.

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page A10 of

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:23.DAT

Proj. No. : 8913-73

Unit : 2

184363

## \*\*\* Connection Data \*\*\*

From	To	Rating	R (ohms)	Cable X (ohms)	% Imp OA Base	% Imp Tol	X/R OA kVA	Tap Ratio	Ratio
480V SWGR 25	480V MCC 25-1	220.0 Amps	.0113708	.0059241					
480V SWGR 25	480V MCC 25-2	220.0 Amps	.0146720	.0076440					
480V SWGR 25	480V MCC 25-3	220.0 Amps	.0183400	.0095550					
480V SWGR 25	480V MCC 25-6	280.0 Amps	.0136920	.0093632					
480V SWGR 25	480V HRSS BLDG MCC	190.0 Amps	.0159750	.0068500					
480V SWGR 26	480V MCC 16/26-1	220.0 Amps	.0393524	.0205023					
480V SWGR 26	480V MCC 26-2	220.0 Amps	.0232132	.0120939					
480V SWGR 26	480V MCC 26-3	220.0 Amps	.0069168	.0036036					
480V SWGR 26	480V MCC 16/26-4	220.0 Amps	.0388284	.0202293					
480V SWGR 26	480V MCC 16/26-5	220.0 Amps	.0511948	.0266721					
480V SWGR 26	480V MCC 16/26-6	220.0 Amps	.0441732	.0230139					
480V SWGR 27	480V MCC 27-1	390.0 Amps	.0068750	.0064750					
480V SWGR 27	480V MCC 27-2	220.0 Amps	.0086460	.0045045					
480V SWGR 27	480V MCC 17/27-3	220.0 Amps	.0138336	.0072072					
480V SWGR 27	480V MCC 17/27-4	220.0 Amps	.0153008	.0079716					
480V SWGR 27	480V MCC 27-5	280.0 Amps	.0112032	.0076608					



Date : 04-13-92

Utility : Sargent &amp; Lundy Internal Use

Station : QUAD CITIES-FILE:23.DAT

Proj. No. : 8913-73

Unit : 2

184363

## \*\*\* Connection Data \*\*\*

From	To	Rating	R (ohms)	X (ohms)	% Imp OA Base	% Imp Tol	X/R	Tap
							Ratio	Ratio
480V SWGR 27	480V MCC 27-6	220.0 Amps	.0144624	.0075348				
480V SWGR 28	480V MCC 28-1A	220.0 Amps	.0156152	.0081354				
480V SWGR 28	480V MCC 28-1B	220.0 Amps	.0153008	.0079716				
480V SWGR 28	480V MCC 28-2	220.0 Amps	.0145148	.0075621				
480V SWGR 28	480V MCC 28-3	400.0 Amps	.0123750	.0116550				
480V SWGR 29	480V MCC 29-1	220.0 Amps	.0141462	.0071253				
480V SWGR 29	480V MCC 29-2	220.0 Amps	.0156638	.0078897				
480V SWGR 29	480V MCC 29-3	220.0 Amps	.0155554	.0078351				
480V SWGR 29	480V MCC 29-4	220.0 Amps	.0136584	.0068796				
480V SWGR 29	480V MCC 28/29-5	220.0 Amps	.0155012	.0078078				
480V SWGR 29	480V MCC 29-6	290.0 Amps	.0111254	.0076076				
4KV SWGR 24-1	4KV SWGR 14-1	800.0 Amps	.0014626	.0098974				
4KV SWGR 14-1	4KV SWGR 14	680.0 Amps	.0044496	.0093936				
4KV SWGR 14-1	DIESEL GENERATOR 1	600.0 Amps	.0085750	.0151900				
4KV SWGR 14-1	HIGH SIDE OF XFMR 19	390.0 Amps	.0064625	.0075435				
HIGH SIDE OF XFMR 19	480V SWGR 19	1680.0 kVA			11.430	00.0	1500.0	8.5 .975

Date : 04-13-92

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DATProj. No. : 8913-73  
Unit : 2

## \*\*\* 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 19-1	220.0 Amps	.0181828	.0094731					
480V SWGR 19	480V MCC 19-2	220.0 Amps	.0081744	.0042588					
480V SWGR 19	480V MCC 19-3	220.0 Amps	.0205408	.0107016					
480V SWGR 19	480V MCC 19-4	220.0 Amps	.0172920	.0090090					
480V SWGR 19	480V MCC 18/19-5	220.0 Amps	.0169776	.0088452					
480V SWGR 19	480V MCC 19-6	280.0 Amps	.0136150	.0093100					
Equivalent Source	4KV SWGR 24-1	9999.0 Amps	.0000000	.0010000					
480V MCC 29-1	LOAD 518 TERM	2000.0 Amps	.2889000	.0214000					
480V MCC 29-1	LOAD 519 TERM	2000.0 Amps	1.2562000	.0160000					
480V MCC 29-1	LOAD 520 TERM	2000.0 Amps	2.2915000	.0275000					
480V MCC 29-1	LOAD 521 TERM	2000.0 Amps	2.4764000	.0316000					
480V MCC 29-1	LOAD 523 TERM	2000.0 Amps	.0920000	.0139000					
480V MCC 29-1	LOAD 524 TERM	2000.0 Amps	1.1021000	.0140000					
480V MCC 29-1	LOAD 529 TERM	2000.0 Amps	.2498000	.0166000					
80V MCC 29-1	LOAD 530 TERM	2000.0 Amps	.0979000	.0223000					
80V MCC 29-1	LOAD 532 TERM	2000.0 Amps	1.0732000	.0126000					

Date : 04-13-92

AC Electrical Load Monitoring System Ver 2.20

Sargent &amp; Lundy Engineers

Chicago, Ill.

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page A13 of

Utility : Sargent &amp; Lundy Internal Use

Proj. No. : 8913-73

Station : QUAD CITIES-FILE:Z3.DAT

Unit : 2

184363

## \*\*\* Connection Data \*\*\*

From	To	Rating	Cable R (ohms)	X (ohms)	% Imp OA Base	% Imp Tol	X/R OA kVA	Tap Ratio
480V MCC 29-1	LOAD 535 TERM	2000.0 Amps	1.3054000	.0319000				
480V MCC 29-1	LOAD 542 TERM	2000.0 Amps	.4576000	.0128000				
480V MCC 29-1	LOAD 543 TERM	2000.0 Amps	.8790000	.0112000				
480V MCC 29-1	LOAD 544 TERM	2000.0 Amps	.0891000	.0134000				
480V SWGR 29	LOAD 515 TERM	2000.0 Amps	.0695000	.0298000				
480V MCC 29-2	LOAD 550 TERM	2000.0 Amps	.4822000	.0061000				
480V MCC 29-2	LOAD 552 TERM	2000.0 Amps	.4658000	.0059000				
480V MCC 29-2	LOAD 551 TERM	2000.0 Amps	.0184000	.0042000				
480V MCC 29-2	LOAD 553 TERM	2000.0 Amps	.0262000	.0039000				
480V MCC 29-2	LOAD 560 TERM	2000.0 Amps	2.9863000	.0290000				
480V MCC 29-2	LOAD 561 TERM	2000.0 Amps	2.9863000	.0290000				
480V MCC 29-2	LOAD 567 TERM	2000.0 Amps	.1216000	.0183000				
480V MCC 29-2	LOAD 556 TERM	2000.0 Amps	.7839000	.0202000				
480V MCC 29-4	LOAD 577 TERM	2000.0 Amps	.1729000	.0115000				
480V MCC 29-4	LOAD 578 TERM	2000.0 Amps	.3471000	.0097000				
480V MCC 29-4	LOAD 580 TERM	2000.0 Amps	.7216000	.0092000				

Date : 04-13-92

AC Electrical Load Monitoring System Ver 2.20

Sargent & Lundy Engineers

Chicago, Ill.

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page A14 of

184363

Utility : Sargent & Lundy Internal Use

Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73

Unit : 2

\*\*\* Connection Data \*\*\*

From	To	Rating	R (ohms)	Cable X (ohms)	% Imp OA Base	% Imp Tol	OA kVA	X/R Ratio	Tap Ratio
480V MCC 29-4	LOAD 581 TERM	2000.0 Amps	1.0483000	.0123000					
480V MCC 29-4	LOAD 582 TERM	2000.0 Amps	1.6038000	.0088000					
480V MCC 29-1	LOAD 527 TERM	2000.0 Amps	1.6492000	.0202000					

Date : 04-01-92

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

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page A15 of

184363

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITI2S-FILE:23.DAT

Proj. No. : 8913-73  
Unit : 2

\*\*\* Load Data \*\*\*

Rec # 505      RECEPTACLE B/MC-25&B/MC-26      Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	Master Diagram #	Sys
480V MCC 2B-3	460.	3.0 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 # 506      TEMP CONT UNIT JB 2RB-301      Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	Master Diagram #	Sys
480V MCC 2B-3	480.	8.0 KW	R	100.0	90.0	0.	20.0	0	.0000		
Running Load : Condition 1:      8.0 KW   2:      8.0 KW   3:      8.0 KW   4:      8.0 KW											

Rec # 507      METEOROLOGICAL TWR HSE ENVI      Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	Master Diagram #	Sys
480V MCC 2B-3	480.	20.0 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											

Rec # 508 2-1902B      FUEL POOL CLG WTR PMP 2B      Status : E      \*\*\* Safety - Related \*\*\*

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	Master Diagram #	Sys
480V SWGR 29	460.	100.0 HP	1	90.0	85.0	625.	37.0	1770	.0000		
Running Load : Condition 1:      .0 HP   2:      .0 HP   3:      .0 HP   4:      .0 HP											

Rec # 509 2-3701B      RX BLDG CLG WTR PMP 2B      Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	Master Diagram #	Sys
480V SWGR 29	460.	125.0 HP	1	90.0	85.0	625.	35.0	1780	.0000		
Running Load : Condition 1:      .0 HP   2:      .0 HP   3:      .0 HP   4:      .0 HP											

Rec # 510 2-5704B      RX BLDG EXH FAN 2B      Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	Master Diagram #	Sys
480V SWGR 29	460.	100.0 HP	1	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 # 511 2-5704C      RX BLDG EXH FAN 2C      Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	Master Diagram #	Sys
80V SWGR 29	460.	100.0 HP	1	90.0	85.0	625.	37.0	1775	.0000		
Running Load : Condition 1:      .0 HP   2:      .0 HP   3:      .0 HP   4:      .0 HP											

184363

Date : 04-01-92

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

\*\*\* Load Data \*\*\*

Rec # 512 2-5703A RX BLDG SPLY FAN 2A Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable
480V SWGR 29	460.	100.0 HP	1	90.0	85.0	625.	37.0	1800	(sec) Master Diagram # # Sys
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP									

Rec # 513 2-5705C TURB BLDG EXH FAN 2C Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable
480V SWGR 29	460.	150.0 HP	1	90.0	85.0	625.	33.0	1780	(sec) Master Diagram # # Sys
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP									

Rec # 514 RX BLDG LIGHTING 2 Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable
480V SWGR 29	480.	108.0KVA	R	100.0	90.0	0.	20.0	0	(sec) Master Diagram # # Sys
Running Load : Condition 1: 89.1 KVA 2: 89.1 KVA 3: 89.1 KVA 4: 89.1 KVA									

Rec # 515 2-5702B E. TURB BLDG SPLY FAN 2B Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable
480V SWGR 29	460.	100.0 HP	1	90.0	85.0	625.	37.0	1800	(sec) Master Diagram # # Sys
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP									

Rec # 516 2-3903 DG CLG WTR PMP #2 Status : E \*\*\* Safety - Related \*\*\*

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable
LOAD 516 TERM	460.	100.0 HP	1	100.0	86.0	615.	41.0	3550	(sec) Master Diagram # # Sys
Running Load : Condition 1: 90.0 HP 2: 90.0 HP 3: 90.0 HP 4: 90.0 HP									

ec # 517 1/2-3701C RX BLDG CLG PMP 1/2C Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable
80V SWGR 29	460.	125.0 HP	1	90.0	85.0	625.	35.0	1780	(sec) Master Diagram # # Sys
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP									

ec # 518 2-5727 DG HVAC SPLY FAN 2 Status : E \*\*\* Safety - Related \*\*\*

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable
LOAD 518 TERM	460.	50.0 HP	1	90.0	85.0	625.	38.0	1150	(sec) Master Diagram # # Sys
Running Load : Condition 1: .0 HP 2: 48.0 HP 3: 48.0 HP 4: 48.0 HP									



Date : 04-01-92

Sargent &amp; Lundy Engineers

Rev. 0

Chicago, Ill.

Project No. 8913-73

Page 417 of

184363

Utility : Sargent &amp; Lundy Internal Use

Proj. No. : 8913-73

Station : QUAD CITIES-FILE:Z3.DAT

Unit : 2

## \*\*\* Load Data \*\*\*

Rec # 519 2-57488 CORE SPRAY EMERG AHU 2B Status : E \*\*\* Safety - Related \*\*\*

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type (%)	(%)	(%) (sec) Master Diagram # # Sys
LOAD 519 TERM	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 # 520 2-5203 NORM FEED DG OIL XFER PMP 2 Status : E \*\*\* Safety - Related \*\*\*

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type (%)	(%)	(%) (sec) Master Diagram # # Sys
LOAD 520 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:	2.7 HP 4: 2.7 HP

Rec # 521 1-5203 ALT FD DG1 FUEL OIL XFR PMP Status : E \*\*\* Safety - Related \*\*\*

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type (%)	(%)	(%) (sec) Master Diagram # # Sys
LOAD 521 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: .0 HP

Rec # 522 120/208V XFMR FD 29-1-1 Status : E \*\*\* Safety - Related \*\*\*

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type (%)	(%)	(%) (sec) Master Diagram # # Sys
480V MCC 29-1	480.	15.0KVA	R	100.0	75.0 0. 20.0 0 .0000
Running Load : Condition 1:	12.1 KVA	2:	12.1 KVA	3:	12.1 KVA 4: 12.1 KVA

Rec # 523 2-1102B STNDBY LQD CONTRL PMP 2B Status : E

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type (%)	(%)	(%) (sec) Master Diagram # # Sys
LOAD 523 TERM	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 # 524 2-5746B RHRS EMERG AHU 2B Status : E \*\*\* Safety - Related \*\*\*

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type (%)	(%)	(%) (sec) Master Diagram # # Sys
LOAD 524 TERM	460.	7.5 HP	1	80.0	85.0 625. 56.0 1740 .0000
Running Load : Condition 1:	.0 HP	2:	7.5 HP	3:	7.5 HP 4: 7.5 HP

Rec # 525 2-1279-2B RX WTR CLNUP SYS FLTR HOPMP Status : E

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type (%)	(%)	(%) (sec) Master Diagram # # Sys
480V MCC 29-1	460.	4.0 HP	1	80.0	85.0 625. 58.0 1800 .0000
Running Load : Condition 1:	.0 HP	2:	4.0 HP	3:	4.0 HP 4: 4.0 HP

Date : 04-01-92

Sargent &amp; Lundy Engineers

Rev. 0

Chicago, Ill.

Project No. 8913-73

Page A18 of

184363

Utility : Sargent &amp; Lundy Internal Use

Proj. No. : 8913-73

Station : QUAD CITIES-FILE:Z3.DAT

Unit : 2

\*\*\* Load Data \*\*\*

Rec # 526 2-5708B DW&TORUS PURGE EXH FAN 2B 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 29-1	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 # 527 2-5747 HPCI EMERG AHU #2 Status : E \*\*\* Safety - Related \*\*\*

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable	Master Diagram #	#	Sys
LOAD 527 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 # 528 2-1279-116 RESIN FEED TKN AGITATOR Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable	Master Diagram #	#	Sys
480V MCC 29-1	460	.8 HP	1	75.0	80.0	625	83.0	1725	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP												

Rec # 529 2-2301-57 HPCI CLG WTR GLN SL CONDPMF Status : E \*\*\* Safety - Related \*\*\*

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable	Master Diagram #	#	Sys
LOAD 529 TERM	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 # 530 1-5727 ALT FD DG RM HVAC SPLY FAN1 Status : E \*\*\* Safety - Related \*\*\*

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable	Master Diagram #	#	Sys
LOAD 530 TERM	460	50.0 HP	1	90.0	85.0	625	38.0	1150	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP												

Rec # 531 2-1205B 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	Master Diagram #	#	Sys
480V MCC 29-1	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 # 532 2252-81A POST LOCA H2 O2 MON PMP 2B Status : E \*\*\* Safety - Related \*\*\*

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable	Master Diagram #	#	Sys
LOAD 532 TERM	460	1.0 HP	1	75.0	80.0	625	79.0	1770	.0000			
Running Load : Condition 1: .0 HP 2: .9 HP 3: .9 HP 4: .9 HP												

Date : 04-01-92

Sargent &amp; Lundy Engineers

Rev. 0

Chicago, Ill.

Project No. 8913-73

Page 220 of

Utility : Sargent &amp; Lundy Internal Use

Proj. No. : 8913-73

Station : QUAD CITIES-FILE:Z3.DAT

Unit : 2

184363

\*\*\* Load Data \*\*\*

Rec # 540 2-1001-187B RHRS HT EXCH REV OUT VLV 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 29-1	480.	1.6 HP I	75.0	80.0	250.	75.0	1800	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 541 2-1001-4B RHRS HT EXCH NORM INL VLV 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 29-1	460.	3.0 HP I	80.0	85.0	607.	58.0	1800	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 542 HPCI TK HTR Status : E \*\*\* Safety - Related \*\*\*

Source Bus	Rated Volts	Rating Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable	Master Diagram #	#	Sys
QAD 542 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 # 543 2-7503 RX BLDG VMT-SBGT SUP DMPR Status : E \*\*\* Safety - Related \*\*\*

Source Bus	Rated Volts	Rating Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable	Master Diagram #	#	Sys
QAD 543 TERM	460.	11.0 HP I	85.0	85.0	279.	49.0	1800	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Rec # 544 2-1103 STANDBY LQD CONT TK HTR Status : E

Source Bus	Rated Volts	Rating Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable	Master Diagram #	#	Sys
QAD 544 TERM	480.	60.0 KW R	100.0	100.0	0.	20.0	0	.0000			
Running Load : Condition 1: 48.4 KW 2: 48.4 KW 3: 48.4 KW 4: 48.4 KW											

Rec # 545 2-3701 CLSD CLG WTR HDR ISOL VLV Status : E

Source Bus	Rated Volts	Rating Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable	Master Diagram #	#	Sys
QV MCC 29-1	460.	1.0 HP I	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 # 546 2-1402-3B CORESPRY PMP SUCT VLV 2B Status : E \*\*\* Safety - Related \*\*\*

Source Bus	Rated Volts	Rating Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable	Master Diagram #	#	Sys
QV MCC 29-1	460.	1.7 HP I	75.0	80.0	251.	75.0	1800	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP											

Date : 04-01-92

Sargent &amp; Lundy Engineers

Rev. 0

Chicago, Ill.

Project No. 8913-73

Page A21 of

184363

Utility : Sargent &amp; Lundy Internal Use

Proj. No. : 8913-73

Station : QUAD CITIES-FILE:Z3.DAT

Unit : 2

\*\*\* Load Data \*\*\*

Rec # 547 2-1402-4A CORESPRY TST BYPS 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 29-1	460.	1.7 HP	I	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 # 548 2A-5701 RECIRC MG SET VENT FAN 2A Status : E

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type (%)	(%)	(%) (%) Speed (sec) Master Diagram # # Sys
480V MCC 29-2	460.	60.0 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 # 549 RX PROT M-G SET 2B Status : E

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type (%)	(%)	(%) (%) Speed (sec) Master Diagram # # Sys
480V MCC 29-2	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 # 550 2-5209B DG STARTING AIR COMPR 2B Status : E \*\*\* Safety - Related \*\*\*

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type (%)	(%)	(%) (%) Speed (sec) Master Diagram # # Sys
OAD 550 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

ec # 551 250VDC BATTERY CHARGER #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
OAD 551 TERM	480.	93.9KVA	R	100.0	95.0 0. 20.0 0 .0000
Running Load : Condition 1:		83.5 KVA	2:	83.5 KVA	3: 83.5 KVA 4: 83.5 KVA

ec # 552 2-5209A DG STARTING AIR COMPR 2A Status : E \*\*\* Safety - Related \*\*\*

Rated	Eff	PF	LRC	St pf	SC TC Modification # / Cable
Source Bus	Volts	Rating	Type (%)	(%)	(%) (%) Speed (sec) Master Diagram # # Sys
OAD 552 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: .0 HP 4: .0 HP

c # 553 125VDC BATTERY CHARGER #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
AD 553 TERM	480.	39.9KVA	R	100.0	95.0 0. 20.0 0 .0000
Running Load : Condition 1:		35.5 KVA	2:	35.5 KVA	3: 35.5 KVA 4: 35.5 KVA

Date : 04-01-92

Sargent & Lundy Engineers  
Chicago, Ill.

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page 422 of

Utility : Sargent &amp; Lundy Internal Use

Proj. No. : 8913-73

Station : QUAD CITIES-FILE:Z3.DAT

Unit : 2

184363

## \*\*\* Load Data \*\*\*

Rec # 554 TURB BLDG EMERG LGTS 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 29-2	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						

Rec # 555 ALT FD DG1 CWP CLR FANS A&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 29-2	460.	1.5 HP	I	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 # 556 RHR SW PMP 2C 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
LOAD 556 TERM	460.	3.0 HP	I	80.0	85.0	625. 68.0 1730 .0000
Running Load : Condition 1: .0 HP 2: 2.7 HP 3: 2.7 HP 4: 2.7 HP						

Rec # 557 RHRS SW PMP 2C 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 29-2	460.	3.0 HP	I	80.0	85.0	625. 68.0 1730 .0000
Running Load : Condition 1: .0 HP 2: 2.7 HP 3: 2.7 HP 4: 2.7 HP						

Rec # 558 RHR SW PMP 2C 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 29-2	460.	3.0 HP	I	80.0	85.0	625. 68.0 1730 .0000
Running Load : Condition 1: .0 HP 2: 2.7 HP 3: 2.7 HP 4: 2.7 HP						

Rec # 559 RHR SW PMP 2C CLR FAN D 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 29-2	460.	3.0 HP	I	80.0	85.0	625. 68.0 1730 .0000
Running Load : Condition 1: .0 HP 2: 2.7 HP 3: 2.7 HP 4: 2.7 HP						

Rec # 560 DG2 CLG WTR PMP 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
QAD 560 TERM	460.	1.5 HP	I	75.0	80.0	625. 83.0 1800 .0000
Running Load : Condition 1: 1.4 HP 2: 1.4 HP 3: 1.4 HP 4: 1.4 HP						



Date : 04-01-92

## AC Electrical Load Monitoring System Ver 2.20

Sargent &amp; Lundy Engineers

Chicago, Ill.

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page A23 of

Utility : Sargent & Lundy Internal Use  
 Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
 Unit : 2

184363

\*\*\* Load Data \*\*\*

Rec # 561 DG2 CLG WTR PMP 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  
 LOAD 561 TERM 460. 1.5 HP 1 75.0 80.0 625. 83.0 1800 .0000  
 Running Load : Condition 1: 1.4 HP 2: 1.4 HP 3: 1.4 HP 4: 1.4 HP

Rec # 562 RHR SW PMP 2D 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 29-2 460. 3.0 HP 1 80.0 85.0 625. 68.0 1730 .0000  
 Running Load : Condition 1: .0 HP 2: 2.7 HP 3: 2.7 HP 4: 2.7 HP

Rec # 563 RHR SW PMP 2D 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 29-2 460. 3.0 HP 1 80.0 85.0 625. 68.0 1730 .0000  
 Running Load : Condition 1: .0 HP 2: 2.7 HP 3: 2.7 HP 4: 2.7 HP

Rec # 564 RHR SW PMP 2D 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 29-2 460. 3.0 HP 1 80.0 85.0 625. 68.0 1730 .0000  
 Running Load : Condition 1: .0 HP 2: 2.7 HP 3: 2.7 HP 4: 2.7 HP

Rec # 565 RHR SW PMP 2D CLR FAN D Status : E \*\*\* Safety - Related \*\*\*  
 Rated Eff PF LRC St pf SC TC Modification # / Cable  
 Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys  
 80V MCC 29-2 460. 3.0 HP 1 80.0 85.0 625. 68.0 1730 .0000  
 Running Load : Condition 1: .0 HP 2: 2.7 HP 3: 2.7 HP 4: 2.7 HP

Rec # 566 2-5707B RX FD PMP VENT FAN 2B Status : E  
 Rated Eff PF LRC St pf SC TC Modification # / Cable  
 Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys  
 30V MCC 29-2 460. 60.0 HP 1 90.0 85.0 625. 38.0 1750 .0000  
 Running Load : Condition 1: 54.0 HP 2: 54.0 HP 3: 54.0 HP 4: 54.0 HP

Rec # 567 2-2501 ACAD AIR COMPR Status : E \*\*\* Safety - Related \*\*\*  
 Rated Eff PF LRC St pf SC TC Modification # / Cable  
 Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys  
 AD 567 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 : 04-01-92

Sargent &amp; Lundy Engineers

Rev. 0

Chicago, Ill.

Project No. 8913-73

Page Ac4 of

Utility : Sargent &amp; Lundy Internal Use

Proj. No. : 8913-73

Station : QUAD CITIES-FILE:Z3.DAT

Unit : 2

184363

\*\*\* Load Data \*\*\*

Rec # 568 2-5620A TURB BEARING LIFT PMP 2A Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	Master Diagram #	#	Sys
480V MCC 29-3	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 # 569 2-5620B TURB BEARING LIFT PMP 2B Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	Master Diagram #	#	Sys
480V MCC 29-3	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 # 570 2-5620C TURB BEARING LIFT PMP 2C Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	Master Diagram #	#	Sys
480V MCC 29-3	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 # 571 2-5620D TURB BEARING LIFT PMP 2D Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	Master Diagram #	#	Sys
480V MCC 29-3	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 # 572 2-5620E TURB BEARING LIFT PMP 2E Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	Master Diagram #	#	Sys
480V MCC 29-3	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 # 573 2-5600 TURBINE TURNING GEAR Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	Master Diagram #	#	Sys
480V MCC 29-3	460.	60.0 HP	1	90.0	85.0	625.	38.0	1175	.0000			
Running Load : Condition 1: .0 HP 2: 60.0 HP 3: 60.0 HP 4: 60.0 HP												

Rec # 574 2-5608 TURB TURNING GEAR OIL PMP Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	Master Diagram #	#	Sys
480V MCC 29-3	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												

Date : 04-01-92

Sargent &amp; Lundy Engineers

REV. 0

Chicago, Ill.

Project No. 8913-73

Page H25 of

184363

Utility : Sargent &amp; Lundy Internal Use

Proj. No. : 8913-73

Station : QUAD CITIES-FILE:Z3.DAT

Unit : 2

## \*\*\* Load Data \*\*\*

Rec # 575 2-5788E DRYWELL CLG BLR 2E Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable	Master Diagram #	#	Sys
480V MCC 29-3	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 # 576 2-5734 DRYWELL CLG BLR 2D Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable	Master Diagram #	#	Sys
480V MCC 29-4	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 # 577 1/2-7503A SBTG 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
LOAD 577 TERM	480.	30.0 KW	R	100.0	100.0	0.	20.0	0	.0000			
Running Load : Condition 1: 24.6 KW 2: 24.6 KW 3: 24.6 KW 4: 24.6 KW												

Rec # 578 1/2-5706A SBTG 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
LOAD 578 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 # 579 2-3799 DW/TORUS DIFF PRESS COMP 2B Status : E

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable	Master Diagram #	#	Sys
480V MCC 29-4	460.	40.0 HP	1	85.0	85.0	625.	40.0	1765	.0000			
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP												

ec # 580 1/2-7504A SBTG OUTSD AIR SPLY DAMPER Status : E \*\*\* Safety - Related \*\*\*

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable	Master Diagram #	#	Sys
QAD 580 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												

ec # 581 1/2-7507A SBTG FAN DISCH DAMPER 1/2A Status : E \*\*\* Safety - Related \*\*\*

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable	Master Diagram #	#	Sys
QAD 581 TERM	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												

Date : 04-01-92

## AC Electrical Load Monitoring System Ver 2.20

Sargent & Lundy Engineers  
Chicago, Ill.

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page 426 of

184363

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DATProj. No. : 8913-73  
Unit : 2

\*\*\* Load Data \*\*\*

Rec # 582 1/2-7505A SBTG SYS IM DAMPER 1/2A Status : E \*\*\* Safety - Related \*\*\*

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable
LOAD 582 TERM	460.	.7 HP	1	75.0	80.0	521.	83.0	1700	.0000
Running Load : Condition 1:		.0 HP	2:		.0 HP	3:		.0 HP	4: .0 HP

Rec # 583 2-1001-26B RHRS CONT SPRY SHTOF ISOVLV Status : E \*\*\* Safety - Related \*\*\*

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable
480V MCC 29-4	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 # 584 2-1001-23B RHRS BACKUP CONT SPRY VLV2B Status : E \*\*\* Safety - Related \*\*\*

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable
480V MCC 29	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 # 585 100-348 RHR MN SHTOF TO SPRN CH VLV Status : E \*\*\* Safety - Related \*\*\*

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable
480V MCC 29-4	460.	4.0 HP	1	80.0	85.0	543.	58.0	1800	.0000
Running Load : Condition 1:		.0 HP	2:		.0 HP	3:		.0 HP	4: .0 HP

Rec # 586 2-1001-36B RHRS SPRN CH DMPLW VLV 2B Status : E \*\*\* Safety - Related \*\*\*

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable
80V MCC 29-4	460.	.6 HP	1	75.0	80.0	566.	83.0	1800	.0000
Running Load : Condition 1:		.0 HP	2:		.0 HP	3:		.0 HP	4: .0 HP

Rec # 587 2-1001-37B RHRS SPRN CH SPRY HDR VLV2B Status : E \*\*\* Safety - Related \*\*\*

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable
80V MCC 29-4	460.	.7 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 # 588 2-1001-43C RHRS SHTDN CLG VLV 2C Status : E \*\*\* Safety - Related \*\*\*

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed (sec)	SC TC Modification # / Cable
80V MCC 29-4	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

Date : 04-01-92

Sargent &amp; Lundy Engineers

Rev. 0

Chicago, Ill.

Project No. 8913-73

Page A27 of

184363

Utility : Sargent &amp; Lundy Internal Use

Proj. No. : 8913-73

Station : QUAD CITIES-FILE:23.DAT

Unit : 2

\*\*\* Load Data \*\*\*

Rec # 589 2-1001-430 RHRS SHTDN CLG VLV 2D 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 29-4 460. 1.0 HP 1 75.0 80.0 714. 79.0 1800 .0000  
 Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP

Rec # 590 2-1001-19B RHRS CLG PMP CRS HDR 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 29-4 460. 2.6 HP 1 80.0 85.0 302. 68.0 1800 .0000  
 Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP

Rec # 591 2-1001-16B RHRS HT EXCH 1003B BYPS 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 29-4 460. 5.3 HP 1 80.0 85.0 536. 56.0 1800 .0000  
 Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP

Rec # 592 2-1001-7D RHRS CLNT PMP SUCT HDR 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 29-4 460. 1.0 HP 1 75.0 80.0 426. 79.0 1800 .0000  
 Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP

Rec # 593 2-1001-5B RHRS CONT CLNT SERV WTR 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 29-4 460. .6 HP 1 75.0 80.0 571. 83.0 1700 .0000  
 Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP

Rec # 594 2-1001-7C RHRS CLNT PMP SUCT HDR 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 29-4 460. 1.0 HP 1 75.0 80.0 286. 79.0 1800 .0000  
 Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP

Rec # 595 2-202-6A RX WTR RECIRC LP EDLG VLV2A 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 28/29-5 440. 8.0 HP 1 80.0 85.0 625. 54.0 1800 .0000  
 Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP

Date : 04-01-92

Sargent &amp; Lundy Engineers

REV. 0

Chicago, Ill.

Project No. 8913-73

Page 228 of —

Utility : Sargent &amp; Lundy Internal Use

Proj. No. : 8913-73

Station : QUAD CITIES-FILE:23.DAT

Unit : 2

184363

## \*\*\* Load Data \*\*\*

Rec # 596 2-202-4A 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 28/29-5 460. 16.0 HP I 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 # 597 2-202-5A RX WTR RECIRC PMP DISCHGVLV 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 28/29-5 460. 14.0 HP I 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 # 598 2-1001-29A RHRS INBD SHTOF VLV 2A 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 28/29-5 460. 20.6 HP I 85.0 85.0 759. 43.0 3365 .0000  
 Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP

Rec # 599 2-1001-28A RHRS OUTBD SHTOF VLV 2A 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 28/29-5 460. 52.0 HP I 90.0 85.0 829. 38.0 1800 .0000  
 Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP

Rec # 600 2-202-9A RX WTR RECIRC LP EQU BPSVLV Status : E \*\*\* Safety - Related \*\*\*  
 Rated Eff PF LRC St pf SC TC Modification # / Cable  
 Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys  
 80V MCC 28/29-5 440. .1 HP I 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 # 601 2-202-6B RX WTR RECIRC LP EXLG VLV2B Status : E \*\*\* Safety - Related \*\*\*  
 Rated Eff PF LRC St pf SC TC Modification # / Cable  
 Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys  
 80V MCC 28/29-5 460. 8.0 HP I 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 # 602 2-202-4B 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  
 80V MCC 28/29-5 460. 15.0 HP I 85.0 85.0 625. 44.0 1800 .0000  
 Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP



Date : 04-01-92

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:23.DAT

Proj. No. : 8913-73  
Unit : 2

184363

\*\*\* Load Data \*\*\*

Rec # 603 2-202-58 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 2B/29-5 460. 14.0 HP 1 85.0 85.0 777. 49.0 1800 .0000  
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP

Rec # 604 2-1001-298 RHRS INBD SHTOF 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 2B/29-5 460. 20.6 HP 1 85.0 85.0 759. 43.0 1800 .0000  
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP

Rec # 605 2-1001-288 RHRS OUTBD SHTOF 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 2B/29-5 460. 52.0 HP 1 90.0 85.0 829. 38.0 3530 .0000  
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP

Rec # 606 2-202-9B RX WTR RECIRC LP EQL BPSVLV Status : E \*\*\* Safety - Related \*\*\*  
Rated Eff PF LRC St pf SC TC Modification # / Cable  
Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys  
80V MCC 2B/29-5 440. .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 # 607 2-5734G DRYWELL CLG BLWR 2G Status : E  
Rated Eff PF LRC St pf SC TC Modification # / Cable  
Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys  
80V MCC 29-6 460. 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 # 608 2-5734C DRYWELL CLG BLWR 2C Status : E  
Rated Eff PF LRC St pf SC TC Modification # / Cable  
Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys  
10V MCC 29-6 460. 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 # 609 2-5417A GLYCOL PMP 2A Status : E  
Rated Eff PF LRC St pf SC TC Modification # / Cable  
Source Bus Volts Rating Type (%) (%) (%) (%) Speed (sec) Master Diagram # # Sys  
0V MCC 20-1 460. 5.0 HP 1 80.0 85.0 625. 58.0 1800 .0000  
Running Load : Condition 1: 4.5 HP 2: 4.5 HP 3: 4.5 HP 4: 4.5 HP



Date : 04-01-92

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

Calc. No. 8913-73-14-1  
REV. 0  
Project No. 8913-73  
Page A30 of

184363

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

\*\*\* Load Data \*\*\*

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Rec # 771 2-57140 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 25-2	460.	2.0 HP	1	84.0	84.0	86.2	75.0	1750	.0000 M04-2-91-011	77754		
Running Load : Condition 1: 2.0 HP 2: 2.0 HP 3: .0 HP 4: 2.0 HP												

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Rec # 772 1-2399-40 HPCI INBD ISOLN VLV Status : M \*\*\* 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.	.3 HP	1	75.0	80.0	60.2	85.0	1800	.0000 M04-1-91-013B	68350		
Running Load : Condition 1: .0 HP 2: .0 HP 3: .0 HP 4: .0 HP												

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Rec # 773 TURB TRNG GEAR PGBK MOTOR Status : M

Source Bus	Rated Volts	Rating	Type	Eff (%)	PF (%)	LRC (%)	St pf (%)	Speed	SC TC Modification # / Cable	(sec) Master Diagram #	#	Sys
80V MCC 29-3	440.	1.4 HP	1	85.0	60.0	62.5	20.0	450	.0000			
Running Load : Condition 1: .0 HP 2: 1.3 HP 3: 1.3 HP 4: 1.3 HP												

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Date : 04-13-92

AC Electrical Load Monitoring System Ver 2.20

Sargent &amp; Lundy Engineers

Chicago, Ill.

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page A31 of 184363

## \*\*\*\*\* Running Voltage Summary \*\*\*\*\*

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DATProj. No. : 8913-73  
Unit : 2\*\*\*\*\*  
\* 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 Equivalent Source	4160.0	3820.1 91.8 %	3820.1 91.8 %	3820.1 91.8 %	3820.1 91.8 %	
15	4KV SWGR 24-1	4160.0	3820.0 91.8 %	3820.0 91.8 %	3820.0 91.8 %	3820.0 91.8 %	
28	HIGH SIDE OF XFMR 29	4160.0	3819.7 91.8 %	3819.4 91.8 %	3819.4 91.8 %	3819.4 91.8 %	
29	480V SWGR 29	480.0	442.9 92.3 %	435.8 90.8 %	435.9 90.8 %	435.9 90.8 %	
53	480V MCC 29-1	480.0	440.9 91.8 %	431.1 89.8 %	431.0 89.8 %	431.0 89.8 %	
54	480V MCC 29-2	480.0	435.2 90.7 %	426.5 88.9 %	426.8 88.9 %	426.8 88.9 %	
55	480V MCC 29-3	480.0	442.9 92.3 %	429.7 89.5 %	429.8 89.5 %	429.8 89.5 %	
56	480V MCC 29-4	480.0	441.4 91.9 %	434.3 90.5 %	434.4 90.5 %	434.4 90.5 %	
57	480V MCC 28/29-5	480.0	442.9 92.3 %	435.8 90.8 %	435.9 90.8 %	435.9 90.8 %	
58	480V MCC 29-6	480.0	442.9 92.3 %	435.8 90.8 %	435.9 90.8 %	435.9 90.8 %	
70	LOAD 518 TERM	480.0	440.9 91.8 %	400.8 83.5 %	400.7 83.5 %	400.7 83.5 %	
71	LOAD 519 TERM	480.0	440.9 91.8 %	416.8 86.8 %	416.8 86.8 %	416.8 86.8 %	
72	LOAD 520 TERM	480.0	440.9 91.8 %	431.1 89.8 %	417.0 86.9 %	417.0 86.9 %	
73	LOAD 521 TERM	480.0	440.9 91.8 %	431.1 89.8 %	431.0 89.8 %		
74	LOAD 523 TERM	480.0	440.9 91.8 %	431.1 89.8 %	431.0 89.8 %	431.0 89.8 %	

Date : 04-13-92

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

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page A32 of

184363

## \*\*\*\*\* Running Voltage Summary \*\*\*\*\*

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

\*\*\*\*\*  
\* 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
75	LOAD 524 TERM	480.0	440.9 91.8 %	412.1 85.8 %	412.0 85.8 %	412.0 85.8 %	
76	LOAD 529 TERM	480.0	440.9 91.8 %	431.1 89.8 %	431.0 89.8 %	431.0 89.8 %	
77	LOAD 530 TERM	480.0	440.9 91.8 %	431.1 89.8 %	431.0 89.8 %	431.0 89.8 %	
78	LOAD 532 TERM	480.0	440.9 91.8 %	428.8 89.3 %	428.8 89.3 %	428.8 89.3 %	
79	LOAD 533 TERM	480.0	440.9 91.8 %	431.1 89.8 %	431.0 89.8 %	431.0 89.8 %	
80	LOAD 542 TERM	480.0	440.9 91.8 %	431.1 89.8 %	431.0 89.8 %	431.0 89.8 %	
81	LOAD 543 TERM	480.0	440.9 91.8 %	431.1 89.8 %	431.0 89.8 %	431.0 89.8 %	
82	LOAD 544 TERM	480.0	430.9 89.8 %	420.8 87.7 %	420.8 87.7 %	420.8 87.7 %	
83	LOAD 516 TERM	480.0	429.2 89.4 %	421.9 87.9 %	422.0 87.9 %	422.0 87.9 %	
84	LOAD 550 TERM	480.0	435.2 90.7 %	421.1 87.7 %	421.4 87.8 %	421.4 87.8 %	
85	LOAD 552 TERM	480.0	435.2 90.7 %	421.3 87.8 %	426.8 88.9 %	426.8 88.9 %	
86	LOAD 551 TERM	480.0	431.5 89.9 %	422.8 88.1 %	423.1 88.2 %	423.1 88.2 %	
87	LOAD 553 TERM	480.0	433.0 90.2 %	424.3 88.4 %	424.7 88.5 %	424.7 88.5 %	
88	LOAD 560 TERM	480.0	425.6 88.7 %	416.8 86.8 %	417.1 86.9 %	417.1 86.9 %	
89	LOAD 561 TERM	480.0	425.6 88.7 %	416.8 86.8 %	417.1 86.9 %	417.1 86.9 %	

Date : 04-13-92

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

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page A33 of

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

184363

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:23.DAT

Proj. No. : 8913-73  
Unit : 2

\* 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
90	LOAD 567 TERM	480.0	435.2 90.7 %	426.5 88.9 %	426.8 88.9 %	426.8 88.9 %	
91	LOAD 556 TERM	480.0	435.2 90.7 %	421.8 87.9 %	422.1 87.9 %	422.1 87.9 %	
92	LOAD 577 TERM	480.0	431.5 89.9 %	424.3 88.4 %	424.3 88.4 %	424.3 88.4 %	
93	LOAD 578 TERM	480.0	426.8 88.9 %	419.4 87.4 %	419.5 87.4 %	419.5 87.4 %	
94	LOAD 580 TERM	480.0	441.4 91.9 %	434.3 90.5 %	434.4 90.5 %	434.4 90.5 %	
95	LOAD 581 TERM	480.0	441.4 91.9 %	434.3 90.5 %	434.4 90.5 %	434.4 90.5 %	
96	LOAD 582 TERM	480.0	441.4 91.9 %	434.3 90.5 %	434.4 90.5 %	434.4 90.5 %	
97	LOAD 527 TERM	480.0	440.9 91.8 %	419.9 87.5 %	419.9 87.5 %	419.9 87.5 %	

Date : 04-13-92

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

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page A34 of

184363

## \*\*\*\*\* Load Summary by Bus \*\*\*\*\*

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : 480V SWGR 29  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
508	2-1902B /FUEL POOL CLG WTR PMP 2B Status : E Load type : Induction	100.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	90.0	625.0	1770	.0000
								*** Safety - Related ***				
509	2-3701B RX BLDG CLG WTR PMP 2B Status : E Load type : Induction	125.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	90.0	625.0	1780	.0000
510	2-5704B RX BLDG EXH FAN 2B Status : E Load type : Induction	100.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	90.0	625.0	1775	.0000
511	2-5704C RX BLDG EXH FAN 2C Status : E Load type : Induction	100.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	90.0	625.0	1775	.0000
512	2-5703A RX BLDG SPLY FAN 2A Status : E Load type : Induction	100.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	90.0	625.0	1800	.0000
513	2-5705C TURB BLDG EXH FAN 2C Status : E Load type : Induction	150.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	90.0	625.0	1780	.0000
514	RX BLDG LIGHTING 2 Status : E Load type : Resistive	108.0 KVA	89.1 KVA	89.1 KVA	89.1 KVA	89.1 KVA		90.0	100.0	.0	0	.0000
515	2-5702B E. TURB BLDG SPLY FAN 2B Status : E Load type : Induction	100.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0	90.0	625.0	1800	.0000
517	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	85.0	90.0	625.0	1780	.0000
53	Bus name : 480V MCC 29-1 Connection rating : 220.0 Amps		59. kVA	132. kVA	135. kVA	135. kVA						
54	Bus name : 480V MCC 29-2 Connection rating : 220.0 Amps		195. kVA	231. kVA	225. kVA	225. kVA						
55	Bus name : 480V MCC 29-3 Connection rating : 220.0 Amps		0. kVA	153. kVA	153. kVA	153. kVA						
56	Bus name : 480V MCC 29-4 Connection rating : 220.0 Amps		45. kVA	45. kVA	45. kVA	45. kVA						
57	Bus name : 480V MCC 28/29-5 Connection rating : 220.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						

Date : 04-13-92

AC Electrical Load Monitoring System Ver 2.20

Sargent & Lundy Engineers

Chicago, Ill.

Calc. No. 8913-73-14-1

Rev. 0

Project No. 8913-73

Page A35 of

184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : 480V SWGR 29  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
58	Bus name : 480V MCC 29-6 Connection rating : 290.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						
83	Bus name : LOAD 516 TERM Connection rating : 2000.0 Amps		81. kVA	81. kVA	81. kVA	81. kVA						
Total kVA input :			466.	728.	725.	725.						
kW :			431.	657.	654.	654.						
kVAR :			177.	314.	313.	313.						



Date : 04-13-92

AC Electrical Load Monitoring System Ver 2.20

Sargent &amp; Lundy Engineers

Chicago, Ill.

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page 436 of

184363

## \*\*\*\*\* Load Summary by Bus \*\*\*\*\*

Utility : Sargent & Lundy Internal Use  
 Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
 Unit : 2

Bus Name : 480V MCC 29-1  
 Rated Voltage : 480.0 volts  
 Source : 3, Equivalent Source

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					
522	120/208V XFMR-FD 29-1-1	15.0	12.1	12.1	12.1	12.1		75.0	100.0	.0	0	.0000
Status : E	Load type : Resistive	KVA	KVA	KVA	KVA	KVA		*** Safety - Related ***				
525	2-1279-2B RX WTR CLNUP SYS FLTR HOPMP	4.0	.0	4.0	4.0	4.0		85.0	80.0	625.0	1800	.0000
Status : E	Load type : Induction	HP	HP	HP	HP	HP						
526	2-5708B DW&TORUS PURGE EXH FAN 2B	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 ***				
528	2-1279-116 RESIN FEED TNK AGITATOR	.8	.0	.0	.0	.0		80.0	75.0	625.0	1725	.0000
Status : E	Load type : Induction	HP	HP	HP	HP	HP						
531	2-1205B 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						
534	2-1201-80 RWCU SYS RX-BOILER ISOL 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 ***				
535	2-2301-4 HPCI TURB STM SUP ISOL VLV	4.0	.0	.0	.0	.0		85.0	80.0	640.0	1700	.0000
Status : E	Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
536	2-1001-186B RHRS HT EXCH REV INLET VLV	1.6	.0	.0	.0	.0		80.0	75.0	310.0	1800	.0000
Status : E	Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
537	2-1402-24B CORESPRY OUTBD ISOL VLV 2B	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 ***				
538	2-1402-25B CORESPRY INBD ISOL VLV 2B	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 ***				
539	2-1001-185B RHRS HT EXCH NORM OUT VLV	1.6	.0	.0	.0	.0		80.0	75.0	325.0	1800	.0000
Status : E	Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
540	2-1001-187B RHRS HT EXCH REV OUT VLV	1.6	.0	.0	.0	.0		80.0	75.0	250.0	1800	.0000
Status : E	Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
541	2-1001-4B RHRS HT EXCH NORM INL VLV	3.9	.0	.0	.0	.0		85.0	80.0	607.0	1800	.0000
Status : E	Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
545	2-3701 CLSD CLG WTR HDR ISOL 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						

Date : 04-13-92

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

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page A37 of

184363

## \*\*\*\*\* Load Summary by Bus \*\*\*\*\*

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:23.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : 480V MCC 29-1  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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	SC°C (sec)
			1	2	3	4	5					
546	2-1402-3B CORESPRY PMP SUCT VLV 2B Status : E Load type : Induction	1.7 HP	.0 HP	.0 HP	.0 HP	.0 HP		80.0	75.0	251.0	1800	.0000
								*** Safety - Related ***				
547	2-1402-4A CORESPRY TST BYPS VLV Status : E Load type : Induction	1.7 HP	.0 HP	.0 HP	.0 HP	.0 HP		80.0	75.0	638.0	1800	.0000
								*** Safety - Related ***				
70	Bus name : LOAD 518 TERM Connection rating : 2000.0 Amps		0. kVA	50. kVA	50. kVA	50. kVA						
71	Bus name : LOAD 519 TERM Connection rating : 2000.0 Amps		0. kVA	6. kVA	6. kVA	6. kVA						
72	Bus name : LOAD 520 TERM Connection rating : 2000.0 Amps		0. kVA	0. kVA	3. kVA	3. kVA						
73	Bus name : LOAD 521 TERM Connection rating : 2000.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						
74	Bus name : LOAD 523 TERM Connection rating : 2000.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						
75	Bus name : LOAD 524 TERM Connection rating : 2000.0 Amps		0. kVA	9. kVA	9. kVA	9. kVA						
76	Bus name : LOAD 529 TERM Connection rating : 2000.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						
77	Bus name : LOAD 530 TERM Connection rating : 2000.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						
78	Bus name : LOAD 532 TERM Connection rating : 2000.0 Amps		0. kVA	1. kVA	1. kVA	1. kVA						
79	Bus name : LOAD 533 TERM Connection rating : 2000.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						
80	Bus name : LOAD 542 TERM Connection rating : 2000.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						
81	Bus name : LOAD 543 TERM Connection rating : 2000.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						

Date : 04-13-92

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

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page A38 of

184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : 480V MCC 29-1  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
82	Bus name : LOAD 544 TERM Connection rating : 2000.0 Amps		50. kVA	50. kVA	50. kVA	50. kVA						
97	Bus name : LOAD 527 TERM Connection rating : 2000.0 Amps		0. kVA	3. kVA	3. kVA	3. kVA						
Total kVA input :			59.	130.	133.	133.						
kW :			59.	122.	125.	125.						
kVAR :			8.	45.	47.	47.						

Date : 04-13-92

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

Calc. No. 8913-73-14-1

Rev. 0

Project No. 8913-73

Page A39 of

184363

## \*\*\*\*\* Load Summary by Bus \*\*\*\*\*

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : 480V MCC 29-2  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
548	2A-5701 RECIRC MC SET VENT FAN 2A	60.0	.0	.0	.0	.0		85.0	90.0	625.0	1800	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP						
549	RX PROT M-G SET 2B	25.0	16.5	16.5	16.5	16.5		85.0	85.0	625.0	1787	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP						
554	TURB BLDG EMERG LGTS	47.0	.0	.0	.0	.0		90.0	100.0	.0	0	.0000
	Status : E Load type : Resistive	KW	KW	KW	KW	KW						
			*** Safety - Related ***									
555	ALT FD DG1 CWP CLR FANS A&B	1.5	.0	.0	.0	.0		80.0	75.0	625.0	1800	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP						
			*** Safety - Related ***									
557	RHRS SW PMP 2C CLR FAN B	3.0	.0	2.7	2.7	2.7		85.0	80.0	625.0	1730	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP						
			*** Safety - Related ***									
558	RHR SW PMP 2C CLR FAN C	3.0	.0	2.7	2.7	2.7		85.0	80.0	625.0	1730	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP						
			*** Safety - Related ***									
559	RHR SW PMP 2C CLR FAN D	3.0	.0	2.7	2.7	2.7		85.0	80.0	625.0	1730	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP						
			*** Safety - Related ***									
562	RHR SW PMP 2D CLR FAN A	3.0	.0	2.7	2.7	2.7		85.0	80.0	625.0	1730	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP						
			*** Safety - Related ***									
563	RHR SW PMP 2D CLR FAN B	3.0	.0	2.7	2.7	2.7		85.0	80.0	625.0	1730	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP						
			*** Safety - Related ***									
564	RHR SW PMP 2D CLR FAN C	3.0	.0	2.7	2.7	2.7		85.0	80.0	625.0	1730	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP						
			*** Safety - Related ***									
565	RHR SW PMP 2D CLR FAN D	3.0	.0	2.7	2.7	2.7		85.0	80.0	625.0	1730	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP						
			*** Safety - Related ***									
566	2-5707B RX FD PMP VENT FAN 2B	60.0	54.0	54.0	54.0	54.0		85.0	90.0	625.0	1750	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP						
84	Bus name : LOAD 550 TERM		0.	6.	6.	6.						
	Connection rating : 2000.0 Amps		kVA	kVA	kVA	kVA						
85	Bus name : LOAD 552 TERM		0.	6.	0.	0.						
	Connection rating : 2000.0 Amps		kVA	kVA	kVA	kVA						

Date : 04-13-92

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

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page 040 of

184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : 480V MCC 29-2  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
86	Bus name : LOAD 551 TERM Connection rating : 2000.0 Amps		84. kVA	84. kVA	84. kVA	84. kVA						
87	Bus name : LOAD 553 TERM Connection rating : 2000.0 Amps		36. kVA	36. kVA	36. kVA	36. kVA						
88	Bus name : LOAD 560 TERM Connection rating : 2000.0 Amps		2. kVA	2. kVA	2. kVA	2. kVA						
89	Bus name : LOAD 561 TERM Connection rating : 2000.0 Amps		2. kVA	2. kVA	2. kVA	2. kVA						
90	Bus name : LOAD 567 TERM Connection rating : 2000.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						
91	Bus name : LOAD 556 TERM Connection rating : 2000.0 Amps		0. kVA	3. kVA	3. kVA	3. kVA						
Total kVA input :			192.	226.	221.	221.						
kW :			176.	206.	201.	201.						
kVAR :			76.	94.	91.	91.						

Date : 04-13-92

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

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page 041 of

184363

## \*\*\*\*\* Load Summary by Bus \*\*\*\*\*

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : 480V MCC 29-3  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
568	2-5620A Status : E	TURB BEARING LIFT PMP 2A 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
569	2-5620G Status : E	TURB BEARING LIFT PMP 2B 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
570	2-5620C Status : E	TURB BEARING LIFT PMP 2C 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
571	2-5620D Status : E	TURB BEARING LIFT PMP 2D 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
572	2-5620E Status : E	TURB BEARING LIFT PMP 2E 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
573	2-5600 Status : E	TURBINE TURNING GEAR Load type : Induction	60.0 HP	.0 HP	60.0 HP	60.0 HP	60.0 HP	85.0	90.0	625.0	1175	.0000
574	2-5608 Status : E	TURB TURNING GEAR OIL PMP 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
575	2-5788E Status : E	DRYWELL CLG BLR 2E Load type : Induction	84.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	85.0	90.0	625.0	1800	.0000
773	Status : M	TURB TRNG GEAR PGBK MOTOR 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

Total kVA input : 0. 151. 151. 151.

kW : 0. 128. 128. 128.

kVAR : 0. 80. 80. 80.



Date : 04-13-92

## AC Electrical Load Monitoring System Ver 2.20

Sargent &amp; Lundy Engineers

Chicago, Ill.

Calc. No. 8913-73-19-

Rev. 0

Project No. 8913-73

Page A42 of

184363

## \*\*\*\*\* Load Summary by Bus \*\*\*\*\*

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:23.DATProj. No. : 8913-73  
Unit : 2Bus Name : 480V MCC 29-4  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
576	2-5734		DRYWELL CLG BLR 2D	84.0	.0	.0	.0	.0		85.0	90.0	625.0	1800	.0000
	Status : E		Load type : Induction	HP	HP	HP	HP	HP						
579	2-3799		DW/TORUS DIFF PRESS COMP 2B	40.0	.0	.0	.0	.0		85.0	85.0	625.0	1765	.0000
	Status : E		Load type : Induction	HP	HP	HP	HP	HP						
583	2-1001-26B		RHRS CONT SPRY SHTOF ISOVLV	1.6	.0	.0	.0	.0		80.0	75.0	638.0	1800	.0000
	Status : E		Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
584	2-1001-23B		RHRS BACKUP CONT SPRY VLV2B	1.6	.0	.0	.0	.0		80.0	75.0	638.0	1800	.0000
	Status : E		Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
585	1001-34B		RHR MN SHTOF TO SPRN CH VLV	4.0	.0	.0	.0	.0		85.0	80.0	543.0	1800	.0000
	Status : E		Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
586	2-1001-36B		RHRS SPRN CH DMPLN VLV 2B	.6	.0	.0	.0	.0		80.0	75.0	566.0	1800	.0000
	Status : E		Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
587	2-1001-37B		RHRS SPRN CH SPRY HDR VLV2B	.7	.0	.0	.0	.0		80.0	75.0	571.0	1800	.0000
	Status : E		Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
588	2-1001-43C		RHRS SHTDN CLG VLV 2C	1.0	.0	.0	.0	.0		80.0	75.0	571.0	1800	.0000
	Status : E		Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
589	2-1001-43D		RHRS SHTDN CLG VLV 2D	1.0	.0	.0	.0	.0		80.0	75.0	714.0	1800	.0000
	Status : E		Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
590	2-1001-19B		RHRS CLG PMP CRS HDR VLV	2.6	.0	.0	.0	.0		85.0	80.0	302.0	1800	.0000
	Status : E		Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
591	2-1001-16B		RHRS HT EXCH 1003B BYPS VLV	5.3	.0	.0	.0	.0		85.0	80.0	536.0	1800	.0000
	Status : E		Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
592	2-1001-7D		RHRS CLNT PMP SUCT HDR VLV	1.0	.0	.0	.0	.0		80.0	75.0	428.0	1800	.0000
	Status : E		Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
593	2-1001-5B		RHRS CONT CLNT SERV WTR VLV	.6	.0	.0	.0	.0		80.0	75.0	571.0	1700	.0000
	Status : E		Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
594	2-1001-7C		RHRS CLNT PMP SUCT HDR VLV	1.0	.0	.0	.0	.0		80.0	75.0	286.0	1800	.0000
	Status : E		Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				

Date : 04-13-92

AC Electrical Load Monitoring System Ver 2.20

Sargent &amp; Lundy Engineers

Chicago, Ill.

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page #43 of

184363

## \*\*\*\*\* Load Summary by Bus \*\*\*\*\*

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:23.DATProj. No. : 8913-73  
Unit : 2Bus Name : 480V MCC 29-4  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
92	Bus name : LOAD 577 TERM Connection rating : 2000.0 Amps		25. kVA	25. kVA	25. kVA	25. kVA						
93	Bus name : LOAD 578 TERM Connection rating : 2000.0 Amps		21. kVA	21. kVA	21. kVA	21. kVA						
94	Bus name : LOAD 580 TERM Connection rating : 2000.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						
95	Bus name : LOAD 581 TERM Connection rating : 2000.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						
96	Bus name : LOAD 582 TERM Connection rating : 2000.0 Amps		0. kVA	0. kVA	0. kVA	0. kVA						
Total kVA input :			45.	45.	45.	45.						
kW :			44.	44.	44.	44.						
kVAR :			11.	11.	11.	11.						

Date : 04-13-92

AC Electrical Load Monitoring System Ver 2.20

Sargent &amp; Lundy Engineers

Chicago, Ill.

Calc. No. 8913-73-13-1

Rev. 0

Project No. 8913-73

Page A44 of

184363

## \*\*\*\*\* Load Summary by Bus \*\*\*\*\*

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:23.DATProj. No. : 8913-73  
Unit : 2Bus Name : 480V MCC 28/29-5  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
595	2-202-6A	RX WTR/RECIRC LP EDLG VLV2A Status : E Load type : Induction	8.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0 *** Safety - Related ***	80.0	625.0	1800	.0000
596	2-202-4A	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 *** Safety - Related ***	85.0	625.0	1800	.0000
597	2-202-5A	RX WTR RECIRC PMP DISCHGVLV Status : E Load type : Induction	14.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0 *** Safety - Related ***	85.0	777.0	3420	.0000
598	2-1001-29A	RHRS INBD SHTOF VLV 2A Status : E Load type : Induction	20.6 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0 *** Safety - Related ***	85.0	759.0	3365	.0000
599	2-1001-28A	RHRS OUTBD SHTOF VLV 2A Status : E Load type : Induction	52.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0 *** Safety - Related ***	90.0	829.0	1800	.0000
600	2-202-9A	RX WTR RECIRC LP EQU BPSVLV Status : E Load type : Induction	.1 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	80.0 *** Safety - Related ***	75.0	625.0	1800	.0000
601	2-202-6B	RX WTR RECIRC LP EXLG VLV2B Status : E Load type : Induction	8.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0 *** Safety - Related ***	80.0	827.0	1800	.0000
602	2-202-4B	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 *** Safety - Related ***	85.0	625.0	1800	.0000
603	2-202-5B	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 *** Safety - Related ***	85.0	777.0	1800	.0000
604	2-1001-29B	RHRS INBD SHTOF VLV 1B Status : E Load type : Induction	20.6 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0 *** Safety - Related ***	85.0	759.0	1800	.0000
605	2-1001-28B	RHRS OUTBD SHTOF VLV 1B Status : E Load type : Induction	52.0 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	85.0 *** Safety - Related ***	90.0	829.0	3530	.0000
606	2-202-9B	RX WTR RECIRC LP EQU BPSVLV Status : E Load type : Induction	.1 HP	.0 HP	.0 HP	.0 HP	.0 HP	.0	80.0 *** Safety - Related ***	75.0	625.0	1800	.0000

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

kW : 0. 0. 0. 0.

kVAR : 0. 0. 0. 0.

Date : 04-13-92

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

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page 045 of

184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : 480V MCC 29-B  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
607	2-5734G DRYWELL CLG BLWR 2G Status : E Load type : Induction	84.0 HP	.0 HP	.0 HP	.0 HP	.0 HP		85.0	90.0	625.0	1800	.0000
608	2-5734C DRYWELL CLG BLWR 2C Status : E Load type : Induction	84.0 HP	.0 HP	.0 HP	.0 HP	.0 HP		85.0	90.0	625.0	1800	.0000

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

kW : 0. 0. 0. 0.

kVAR : 0. 0. 0. 0.

Date : 04-13-92

AC Electrical Load Monitoring System Ver 2.20

Sargent & Lundy Engineers

Chicago, Ill.

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page 446 of

184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:23.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 518 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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	STC (sec)
			1	2	3	4	5					
518	2-5727 PG HVAC SPLY FAN 2	50.0	0	48.0	48.0	48.0		85.0	90.0	625.0	1150	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				

Total kVA input : 0. 47. 47. 47.

kW : 0. 40. 40. 40.  
kVAR : 0. 25. 25. 25.

Date : 04-13-92

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

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page #47 of

184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 519 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

Load or Bus		Rated hp/kW	Max. Design hp/kW/kVA for Condition					PF	EFF	LRC	Speed	SCTC
No.	** Equip. No./ Load Name or Bus Name **	kVA	1	2	3	4	5	(%)	(%)	(%)	RPM	(sec)
519	2-5748B CORE SPRAY EMERG AHU 2B	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 : 04-13-92

AC Electrical Load Monitoring System Ver 2.20

Sargent & Lundy Engineers  
Chicago, Ill.

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page 448 of

184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:23.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 520 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
520	2-5203 NORM FEED DG OIL XFER PMP 2	3.0	.0	.0	2.7	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.	3.	3.
kw :	0.	0.	3.	3.
kVAR :	0.	0.	2.	2.

Date : 04-13-92

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

Calc. No. 8913-73-19-1  
REV. 0  
Project No. 8913-73  
Page A49 of

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

184363

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 521 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

Load or Bus		Rated hp/kw	Max. Design hp/kw/kVA for Condition					PF	EFF	LRC	Speed	SCTC
No.	** Equip. No./ Load Name or Bus Name **	kVA	1	2	3	4	5	(%)	(%)	(%)	RPM	(sec)
521	1-5203 / ALT FD/ DG1 FUEL OIL XFR PMP	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.

Date : 04-13-92

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

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page 150 of

184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 523 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
523		2-1102B		STNDBY LQD CONTRL PMP 2B	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 : 04-13-92

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

Calc. No. 8913-73-13-1  
Rev. 0  
Project No. 8913-73  
Page 451 of

184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 524 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
524	2-5746B / RHRS EMERG AHU 2B	7.5	.0	7.5	7.5	7.5		85.0	80.0	625.0	1740	.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.

Date : 04-13-92

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

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page 452 of 452

184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 529 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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	STC (sec)
			1	2	3	4	5					
529	2-2301-57 / MPC1 CLG WTR GLW SL CONDMP	25.0	.0	.0	.0	.0	.0	85.0	85.0	625.0	3530	.0000
	Status : E Load type : Induction	HP	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 : 04-13-92

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

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page A53 of

184303

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:23.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 530 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
530	1-5727 ALT FD DG RM HVAC SPLY FAN1	50.0	.0	.0	.0	.0		85.0	90.0	625.0	1150	.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 : 04-13-92

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

Calc. No. 8913-75-19-1  
Rev. 2  
Project No. 8913-75  
Page A54 of

184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 532 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
532	2252-81A POST LOCK H2 Q2 MON PMP 2B	1.0	.0	.9	.9	.9		80.0	75.0	625.0	1770	.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 : 04-13-92

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

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page 455 of

184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 533 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
533		2-5746B	ALT FD RHRS EMERG AHU 2B		7.5	.0	.0	.0	.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.	0.	0.	0.						
kW :						0.	0.	0.	0.						
kVAR :						0.	0.	0.	0.						

Date : 04-13-92

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

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page 456 of

184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 542 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
542	MPCI TK/HTR	9.0	.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.

Date : 04-13-92

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

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page 457 of

184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 543 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
543	2-7503 RX BLDG VNT-SBGT SUP DMPR	11.0	.0	.0	.0	.0		85.0	85.0	279.0	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.

Date : 04-13-92

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page 456 of 184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:23.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 544 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

Load or Bus No.	** Equip. No./ Load Name or Bus Name **	Rated hp/kW kVA	Max. Design hp/kW/kVA for Condition					PF (%)	EF (%)	LRC (%)	Speed RPM	SCTC (sec)
			1	2	3	4	5					
544	2-1103 / STANDBY LQD CONT-TK HTR	60.0	48.4	48.4	48.4	48.4		100.0	100.0	.0	0	.0000
	Status : E Load type : Resistive	KW	KW	KW	KW	KW						
Total kVA input :			48.	48.	48.	48.						
kW :			48.	48.	48.	48.						
kVAR :			0.	0.	0.	0.						

Date : 04-13-92

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

Calc. No. 8913-73-14-1  
Rev. 0  
Project No. 9913-73  
Page A59 of

184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 516 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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	SCIC (sec)
			1	2	3	4	5					
516	2-3903 PG CLG WTR PMP #2	100.0	90.0	90.0	90.0	90.0		86.0	100.0	615.0	3550	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				

Total kVA input : 78. 78. 78. 78.

kW : 67. 67. 67. 67.  
kVAR : 40. 40. 40. 40.



Date : 04-13-92

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

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page 260 of

184363

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

Utility : Sargent & Lundy Internal Use  
Station : GWAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 550 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

Load or Bus		Rated hp/kW kVA	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					
550	2-5209B DG STARTING AIR COMPR 2B	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 : 04-13-92

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

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page A61 of

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:23.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 552 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

184363

Load or Bus		Rated hp/kW kVA	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					
552	2-5209A DG STARTING AIR COMP 2A	5.0	.0	5.0	.0	.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.	0.	0.						
kW :			0.	5.	0.	0.						
kVAR :			0.	3.	0.	0.						

Date : 04-13-92

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

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page 062 of 184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 551 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

Load or Bus	Rated hp/kW	Max. Design hp/kW/kVA for Condition					PF	EFF	LRC	Speed	SCTC
No. ** Equip. No./ Load Name or Bus Name **	kVA	1	2	3	4	5	(%)	(%)	(%)	RPM	(sec)
551 250VDC BATTERY CHARGER #2	93.9	83.5	83.5	83.5	83.5		95.0	100.0	.0	0	.0000
Status : E Load type : Resistive	KVA	KVA	KVA	KVA	KVA		*** Safety - Related ***				

Total kVA input : 84. 84. 84. 84.

kW : 79. 79. 79. 79.

kVAR : 26. 26. 26. 26.

Date : 04-13-92

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

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page 463 of

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

184363

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 553 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
553	T25VDC BATTERY CHARGER #2	39.9	35.5	35.5	35.5	35.5		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.

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

Date : 04-13-92

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page 664 of

184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:23.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 560 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
560	DG2 CLG WTR PMP CLR FAN A	1.5	1.4	1.4	1.4	1.4		80.0	75.0	625.0	1800	.0000
	Status : E Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				

Total kVA input : 2. 2. 2. 2.  
kW : 1. 1. 1. 1.  
kVAR : 1. 1. 1. 1.

Date : 04-13-92

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

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page 865 of

184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:23.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 561 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
561	DG2 CLG WTR PMP CLR FAN B	1.5	1.4	1.4	1.4	1.4		80.0	75.0	625.0	1800	.0000
Status : E	Load type : Induction	HP	HP	HP	HP	HP		*** Safety - Related ***				
Total kVA input :			2.	2.	2.	2.						
kW :			1.	1.	1.	1.						
kVAR :			1.	1.	1.	1.						



Date : 04-13-92

AC Electrical Load Monitoring System Ver 2.20

Sargent & Lundy Engineers

Chicago, Ill.

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page 066 of

184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 567 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
567	2-2501	ACAD ATR COMPR	25.0	.0	.0	.0	.0	.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 :				0.	0.	0.	0.	0.					
kW :				0.	0.	0.	0.	0.					
kVAR :				0.	0.	0.	0.	0.					

Date : 04-13-92

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

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page A67 of

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

184363

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 556 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
556	/RHR SW PMP 2C CLR FAN A	3.0	.0	2.7	2.7	2.7		85.0	80.0	625.0	1730	.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.						

Date : 04-13-92

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

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page A6B of

184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 577 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
577		1/2-7503A	SBGT AIR HTRS		30.0	24.6	24.6	24.6	24.6		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 : 04-13-92

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

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page 069 of

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

184363

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:Z3.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 578 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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	1/2-5706A SGT 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.

Date : 04-13-92

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

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page A70 of

184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:23.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 580 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

Load or Bus		Rated hp/kW kVA	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					
580	1/2-7504A SBT OUTSD AIR SPLY DAMPER	.1	.0	.0	.0	.0	.0	80.0	75.0	625.0	1800	.0000
	Status : E Load type : Induction	HP	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 : 04-13-92

AC Electrical Load Monitoring System Ver 2.20

Sargent & Lundy Engineers

Chicago, Ill.

Calc. No. 8913-73-19-1

Rev. 0

Project No. 0913-73

Page A71 of

184363

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

Utility : Sargent & Lundy Internal Use

Station : QUAD CITIES-FILE:23.DAT

Proj. No. : 8913-73

Unit : 2

Bus Name : LOAD 581 TERM

Rated Voltage : 480.0 volts

Source : 3, Equivalent Source

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					
581	1/2-7507A / SBT FAN DISCH DAMPER 1/2A	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.



Date : 04-13-92

AC Electrical Load Monitoring System Ver 2.20

Sargent & Lundy Engineers

Chicago, Ill.

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page A72 of

184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:23.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 582 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
582	1/2-7505A / SBT SYS IN DAMPER 1/2A	.7	.0	.0	.0	.0	.0	80.0	75.0	521.0	1700	.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 : 04-13-92

Calc. No. 8913-73-19-1  
Rev. 0

Project No. 8913-73  
Page A73 of 184363

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

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:23.DAT

Proj. No. : 8913-73  
Unit : 2

Bus Name : LOAD 527 TERM  
Rated Voltage : 480.0 volts  
Source : 3, Equivalent Source

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					
527	2-5747 MPC1 EMERG AHU #2	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.						

184363

SARGENT & LUNDY  
ENGINEERS

Calc. For Quad Cities 2/11 Safety-related Continuous

Load Running/Starting Voltages

☒ Safety-Related

☐ Non-Safety-Related

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page B1 of

Client	Commonwealth Edison Company
Project	Quad Cities Unit 2
Proj. No.	8913-73
Equip. No.	

Prepared by	Date
Reviewed by	Date
Approved by	Date

## APPENDIX B

## CASE B COMPUTER PRINTOUTS

(BLOCK MOTOR STARTING EVALUATION)

184363

**SARGENT & LUNDY**  
ENGINEERS

Calc. For Quad Cities 2/11 Safety-related Continuous

Load Running/Starting Voltages

X	Safety-Related		Non-Safety-Related
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Calc. I.D. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page 52 of

Client	Commonwealth Edison Company		
Project	Quad Cities Unit 2		
Proj. No.	8913-73	Equip. No.	

Prepared by	Date
Reviewed by	Date
Approved by	Date

Listed in the following order:

Condition 1 Block Motor Starting, File: S1.DAT

Load Tickets for R Type Loads,  
(Bus Data, Connection Data, and other loads remain  
unchanged from Z3.DAT)  
Motor Block Starting Printout

Condition 2 Block Motor Starting, File: S2.DAT

Load Tickets for R Type Loads,  
(Bus Data, Connection Data, and other loads remain  
unchanged from Z3.DAT)  
Motor Block Starting Printout

\*\*\* Sargent &amp; Lundy -- ELMS-AC Program \*\*\*

Calc. No. 8913-73-10-1

Rev. 0

Project No. 8913-73

Page B3 of

Utility : Sargent & Lundy Internal Use  
 Station : QUAD CITIES-FILE:S1.DAT

Project No. : 8913-73  
 Unit No. 2

## AC Load Ticket

Record Number = 514

Equip. No. / Load Name ... RX BLDG LIGHTING 2  
 Status (E,N, or M) ..... E (Existing, New, or Modified)  
 Source Bus Name ..... 480V SWGR 29  
 Motor Rated Volts ..... 480.0  
 Rated hp, kW, or kVA ..... 108.0 \*\*\* Load Brake Power \*\*\*  
 Units (hp,kw, or kVA) .... KVA Cond 1 : 80.8 KVA  
 Load Type (I,S,G or R) ... R Cond 2 : 89.1 KVA  
 Rated Efficiency (%) ..... 100.0 Cond 3 : 89.1 KVA  
 Rated Power Factor (%) ... 90.0 Cond 4 : 89.1 KVA  
 Locked Rotor Current (%) . 0. Cond 5 : 0.0 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) ..... No

Routing:

Comments:

25

Prepared by: \_\_\_\_\_

Reviewed by: \_\_\_\_\_

Approved by: \_\_\_\_\_

\*\*\* Sargent &amp; Lundy -- ELMS-AC Program \*\*\*

Utility : Sargent & Lundy Internal Use  
 Station : QUAD CITIES-FILE:S1.DAT

Project No. : 8913-73  
 Unit No. 2

DRG. No. 8913-73-19-1  
 Rev. 0  
 Project No. 8913-73  
 Page 84 of

## AC Load Ticket

\*\*\*\*\*

Record Number 522

Equip. No. / Load Name ... 120/208V XFMR FD 29-1-1  
 Status (E,N, or M)..... E (Existing, New, or Modified)  
 Source Bus Name ..... 480V MCC 29-1  
 Motor Rated Volts ..... 480.0  
 Rated hp, kW, or kVA ..... 15.0 \*\*\* Load Brake Power \*\*\*  
 Units (hp,kw, or kVA) .... KVA  
 Load Type (I,S,G or R) ... R  
 Rated Efficiency (%) ..... 100.0  
 Rated Power Factor (%) ... 75.0  
 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 : 11.1 KVA  
 Cond 2 : 12.1 KVA  
 Cond 3 : 12.1 KVA  
 Cond 4 : 12.1 KVA  
 Cond 5 : 1.0 KVA

Routing:

Comments:

25

Prepared by: \_\_\_\_\_

Reviewed by: \_\_\_\_\_

Approved by: \_\_\_\_\_

184363

\*\*\* Sargent &amp; Lundy -- ELMS-AC Program \*\*\*

Utility : Sargent & Lundy Internal Use  
 Station : QUAD CITIES-FILE:S1.DAT

Project No. : 8913-73  
 Unit No. 2

Calc. No. 8913-73-19-1  
 Rev. 2  
 Project No. 8913-73  
 Page 85 of

## AC Load Ticket

Record Number = 544

Equip. No. / Load Name ... 2-1103 STANDBY LQD CONT TX HTR  
 Status (E,N, or M) ..... E (Existing, New, or Modified)  
 Source Bus Name ..... LOAD 544 TERM  
 Motor Rated Volts ..... 480.0  
 Rated hp, kW, or kVA ..... 60.0 \*\*\* Load Brake Power \*\*\*  
 Units (hp,kw, or kVA) .... KW Cond 1 : 44.4 KW  
 Load Type (I,S,G or R) ... R Cond 2 : 48.4 KW  
 Rated Efficiency (%) ..... 100.0 Cond 3 : 48.4 KW  
 Rated Power Factor (%) ... 100.0 Cond 4 : 48.4 KW  
 Locked Rotor Current (%) . 0. Cond 5 : 0.0 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) ..... No

Routing:

Comments:

32

prepared by: \_\_\_\_\_

viewed by: \_\_\_\_\_

proved by: \_\_\_\_\_



Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:S1.DAT

Project No. : 8913-73  
Unit No. 2

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page 26 of

AC Load Ticket

Record Number #: 551

Equip. No. / Load Name ... 250VDC BATTERY CHARGER #2  
Status (E,N, or M) ..... E (Existing, New, or Modified)  
Source Bus Name ..... LOAD 551 TERM  
Motor Rated Volts ..... 480.0  
Rated hp, kW, or kVA ..... 93.9 \*\*\* Load Brake Power \*\*\*  
Units (hp/kW, or kVA) .... KVA Cond 1 : 79.5 KVA  
Load Type (I,S,G or R) ... R Cond 2 : 83.5 KVA  
Rated Efficiency (%) ..... 100.0 Cond 3 : 83.5 KVA  
Rated Power Factor (%) ... 95.0 Cond 4 : 83.5 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:

05

Prepared by: \_\_\_\_\_

Reviewed by: \_\_\_\_\_

Approved by: \_\_\_\_\_

184363

\*\*\* Sargent &amp; Lundy -- ELMS-AC Program \*\*\*

Utility : Sargent & Lundy Internal Use  
 Station : QUAD CITIES-FILE:S1.DAT

Project No. : 8913-73  
 Unit No. 2

Calc. No. 8913-73-19-1  
 Rev. 0  
 Project No. 8913-73  
 Page B7 of

## AC Load Ticket

Record Number = 553

Equip. No. / Load Name ...	125VDC BATTERY CHARGER #2
Status (E,N, or M) .....	E (Existing, New, or Modified)
Source Bus Name .....	LOAD 553 TERM
Motor Rated Volts/.....	480.0
Rated hp, kW, or kVA .....	39.9
Units (hp,kW, or kVA) ....	KVA
Load Type (I,S,G or R) ..	R
Rated Efficiency (%) . ...	77.0
Rated Power Factor (%) ..	0.0
Locked Rotor Current (%) .	0.0
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 : 33.8 KVA  
 Cond 2 : 35.5 KVA  
 Cond 3 : 35.5 KVA  
 Cond 4 : 35.5 KVA  
 Cond 5 : .0 KVA

Routing:

Comments:

Prepared by: \_\_\_\_\_

Reviewed by: \_\_\_\_\_

Approved by: \_\_\_\_\_

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:S1.DAT

Project No. : 8913-73  
Unit No. 2

Calc. No. 8913-73-19-1  
Rev. 0  
Project No. 8913-73  
Page 88 of

AC Load Ticket

Record Number is 577

Equip. No. / Load Name ... 1/2-7503A SBT AIR HTRS  
Status (E,N, or M) ..... E (Existing, New, or Modified)  
Source Bus Name .../..... LOAD 577 TERM  
Motor Rated Volts/..... 480.0  
Rated hp, kW, or kVA ..... 30.0 \*\*\* Load Brake Power \*\*\*  
Units (hp,kW, or kVA) .... KW Cond 1 : 22.0 KW  
Load Type (I,S,G or R) ... R Cond 2 : 24.6 KW  
Rated Efficiency (%) ..... 100.0 Cond 3 : 24.6 KW  
Rated Power Factor (%) ... 100.0 Cond 4 : 24.6 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:

12

Prepared by: \_\_\_\_\_

Reviewed by: \_\_\_\_\_

Approved by: \_\_\_\_\_

184363

LAID, No. 0912-73-19-1

Rev. 2

Project No. 8913-72

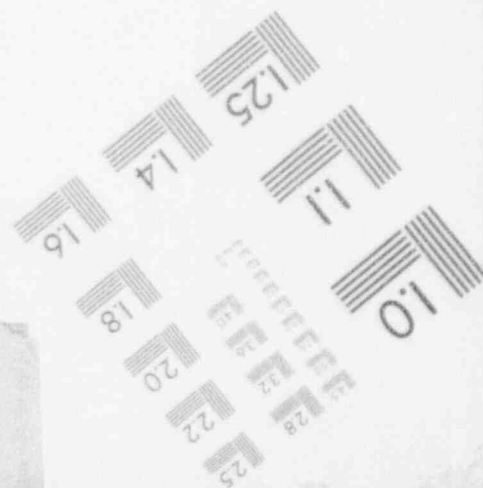
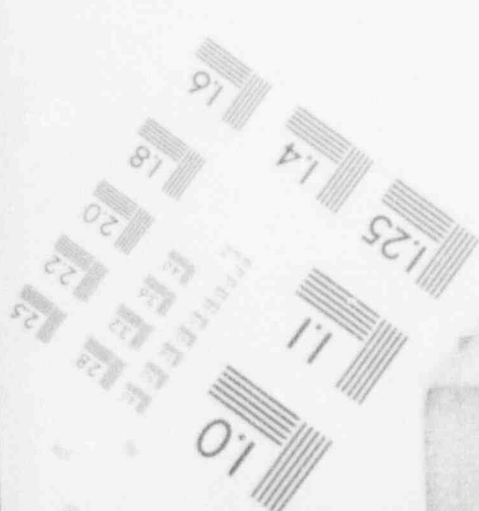
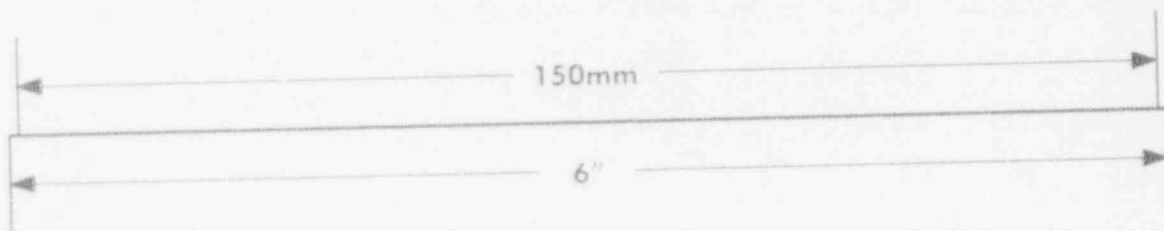
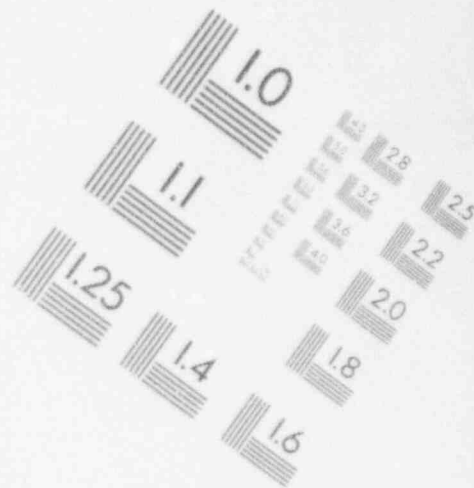
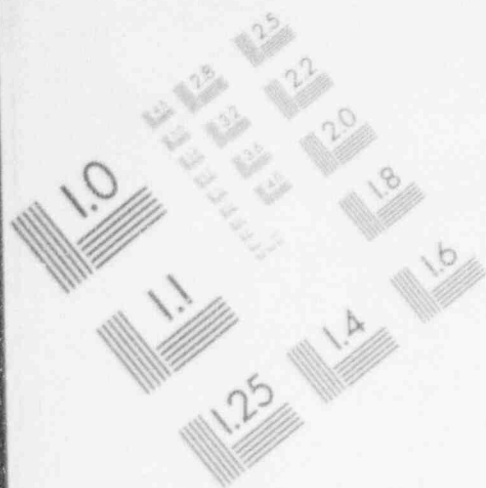
Page 89 of

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

Motor Number	Motor Name	
516	2-3903	DG CLG WTR PMP #2
534	2-1201-80	RWCU SYS RX-BOILER ISOL VLV
560		DGZ CLG WTR PMP CLR FAN A
561		DGZ CLG WTR PMP CLR FAN B
578	1/2-5706A	SBGT FAN 1
580	1/2-7504A	SBGT OUTSD AIR SPLY DAMPER
581	1/2-7507A	SBGT FAN DISCH DAMPER 1/2A
582	1/2-7505A	SBGT SYS IN DAMPER 1/2A
598	2-1001-29A	RHRS INBD SHOT VLV 2A
601	2-202-6B	RX WTR RECIRC LP EXLG VLV2B
603	2-202-5B	RX WTR RECIRC PMP DISCH VLV

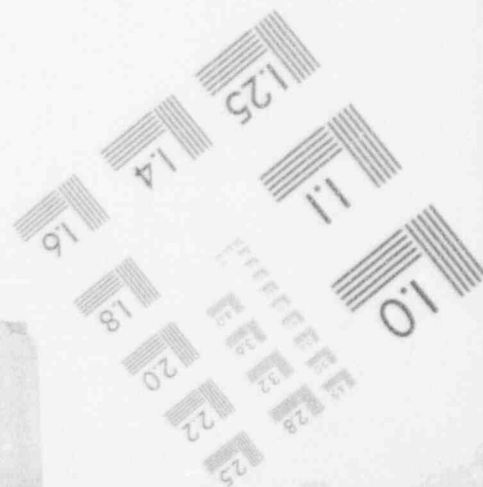
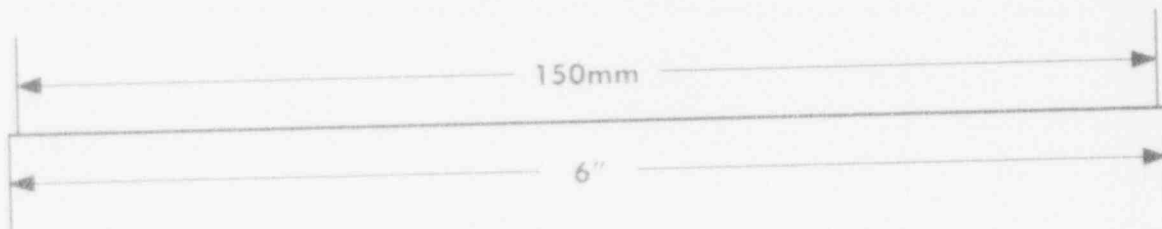
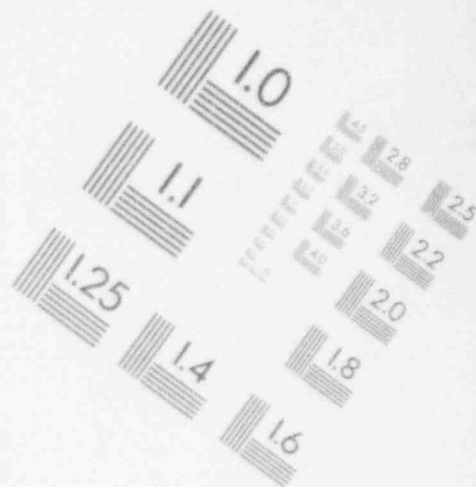
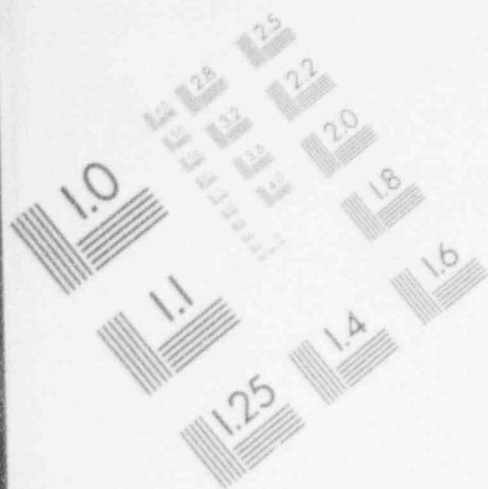
1

IMAGE EVALUATION  
TEST TARGET (MT-3)



1

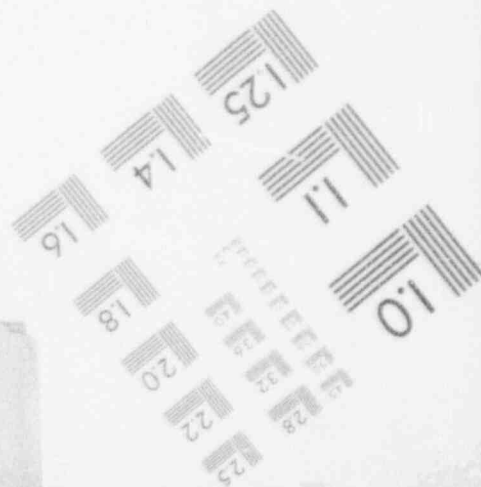
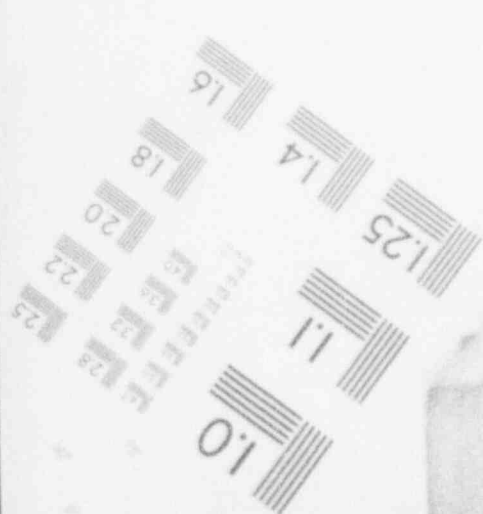
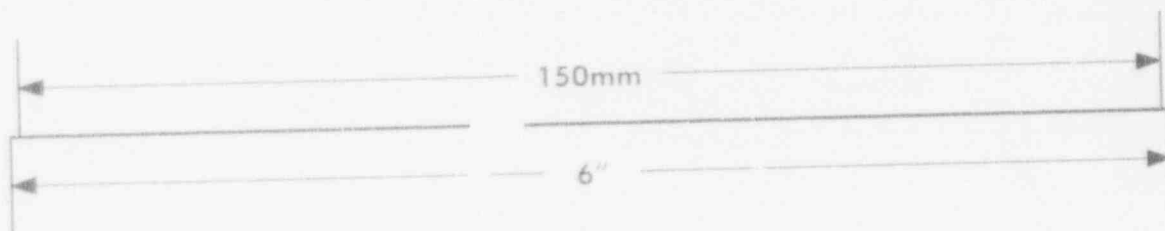
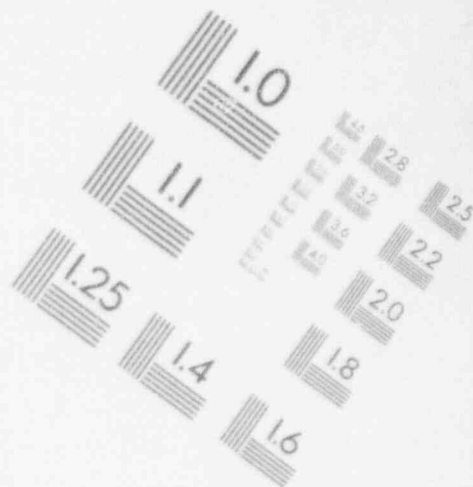
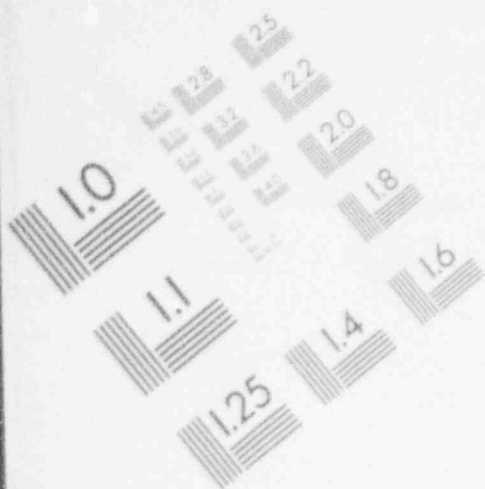
IMAGE EVALUATION  
TEST TARGET (MT-3)





1

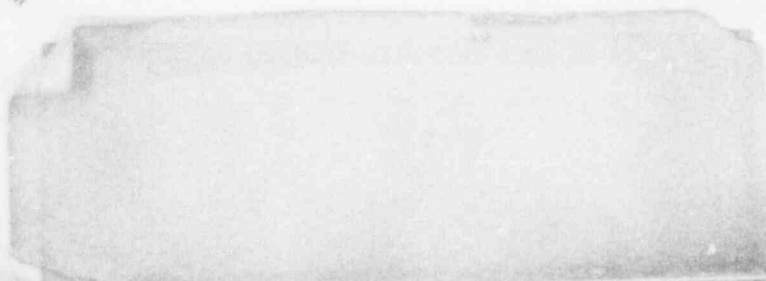
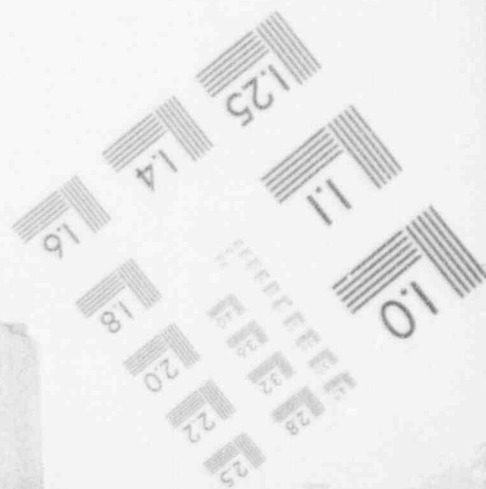
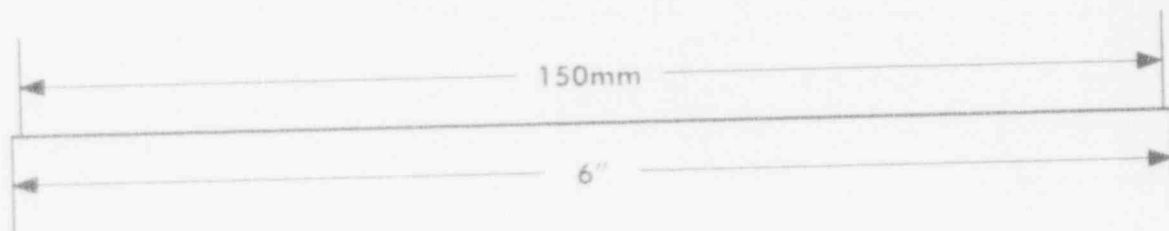
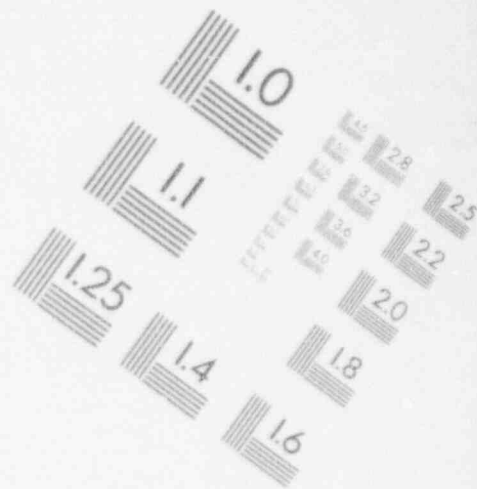
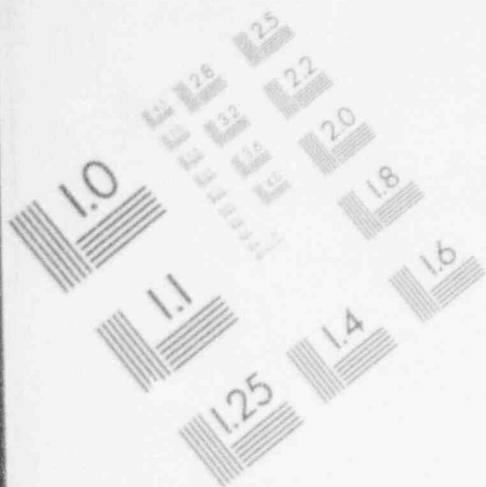
IMAGE EVALUATION  
TEST TARGET (MT-3)





# 1

## IMAGE EVALUATION TEST TARGET (MT-3)



184363

Calc. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page B10 of

SARGENT &amp; 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 Equivalent Source	3820.2	4160.0	91.8
15	4kv SWGR 24-1	3820.0	4160.0	91.8
28	HIGH SIDE OF XFMR 29	3819.0	4160.0	91.8
29	480V SWGR 29	415.1	480.0	86.5
53	480V MCC 29-1	412.8	480.0	86.0
54	480V MCC 29-2	406.5	480.0	84.7
55	480V MCC 29-3	415.1	480.0	86.5
56	480V MCC 29-4	410.6	480.0	85.5
57	480V MCC 28/29-5	405.6	480.0	84.5
58	480V MCC 29-6	415.1	480.0	86.5
70	LOAD 518 TERM	412.8	480.0	86.0
71	LOAD 519 TERM	412.8	480.0	86.0
72	LOAD 520 TERM	412.8	480.0	86.0
73	LOAD 521 TERM	412.8	480.0	86.0
74	LOAD 523 TERM	412.8	480.0	86.0
75	LOAD 524 TERM	412.8	480.0	86.0
76	LOAD 529 TERM	412.8	480.0	86.0
77	LOAD 530 TERM	412.8	480.0	86.0
78	LOAD 532 TERM	412.8	480.0	86.0
79	LOAD 533 TERM	412.8	480.0	86.0
80	LOAD 542 TERM	412.8	480.0	86.0
81	LOAD 543 TERM	412.8	480.0	86.0
82	LOAD 544 TERM	403.0	480.0	84.0
83	LOAD 516 TERM	361.7	480.0	75.3
84	LOAD 550 TERM	406.5	480.0	84.7
85	LOAD 552 TERM	406.5	480.0	84.7
86	LOAD 551 TERM	402.8	480.0	83.9
87	LOAD 553 TERM	404.3	480.0	84.2
88	LOAD 560 TERM	356.3	480.0	74.2
89	LOAD 561 TERM	356.3	480.0	74.2
90	LOAD 567 TERM	406.5	480.0	84.7
91	LOAD 556 TERM	406.5	480.0	84.7
92	LOAD 577 TERM	401.1	480.0	83.6
93	LOAD 578 TERM	368.5	480.0	76.8
94	LOAD 580 TERM	409.4	480.0	85.3
95	LOAD 581 TERM	385.8	480.0	80.4
96	LOAD 582 TERM	399.8	480.0	83.3
97	LOAD 527 TERM	412.8	480.0	86.0

\*\*\* Sargent &amp; Lundy -- ELMS-AC Program \*\*\*

Utility : Sargent & Lundy Internal Use  
 Station : QUAD CITIES-FILE:S2.DAT

Project No. : 8913-73  
 Unit No. 2

Draw. No. 8913-73-15-1  
 Rev. 0  
 Project No. 8913-73  
 Page 211 of

## AC Load Ticket

Record Number 514

Equip. No. / Load Name ...	RX GLDG LIGHTING 2
Status (E,N, or M) .....	E (Existing, New, or Modified)
Source Bus Name .....	480V SWGR 29
Motor Rated Volts .....	480.0
Rated hp, kW, or kVA .....	108.0
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) .....	No

## \*\*\* Load Brake Power \*\*\*

Cond 1 :	89.1 KVA
Cond 2 :	86.7 KVA
Cond 3 :	89.1 KVA
Cond 4 :	89.1 KVA
Cond 5 :	.0 KVA

Routing:

Comment:

Prepared by: \_\_\_\_\_

Reviewed by: \_\_\_\_\_

Approved by: \_\_\_\_\_

184363

\*\*\* Sargent &amp; Lundy -- ELMS-AC Program \*\*\*

Circ. No. 8913-73-19-1

Rev. 0

Project No. 8913-73

Page B12 of

Utility : Sargent & Lundy Internal Use  
Station : QUAD CITIES-FILE:52.DATProject No. : 8913-73  
Unit No. 2

## AC Load Ticket

\*\*\*\*\*

Record Number #: 522 14

Equip. No. / Load Name ... 120/208V XFMR FD 29-1-1  
 Status (E,N, or M) ..... E (Existing, New, or Modified)  
 Source Bus Name .../..... 480V MCC 29-1  
 Motor Rated Volts ..... 480.0  
 Rated hp, kW, or KVA ..... 15.0 \*\*\* Load Brake Power \*\*\*  
 Units (hp,kW, or KVA) .... KVA      Cond 1 : 12.1 KVA  
 Load Type (I,S,G or R) ... R      Cond 2 : 11.3 KVA  
 Rated Efficiency (%) ..... 100.0      Cond 3 : 12.1 KVA  
 Rated Power Factor (%) ... 75.0      Cond 4 : 12.1 KVA  
 Locked Rotor Current (%) . 0.      Cond 5 : 10 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:

00

Entered by: \_\_\_\_\_

Viewed by: \_\_\_\_\_

Approved by: \_\_\_\_\_

184363

\*\*\* Sargent &amp; Lundy -- ELMS-AC Program \*\*\*

Utility : Sargent & Lundy Internal Use  
 Station : QUAD CITIES-FILE:S2.DAT

Project No. : 8913-73  
 Unit No. 2

Calc. No. 8913-73-14-1  
 Rev. 0  
 Project No. 8913-73  
 Page 813 of

## AC Load Ticket

\*\*\*\*\*

Record Number = 544

Equip. No. / Load Name ... 2-1103      STANDBY LQD CONT TK HTR  
 Status (E,N, or M) ..... E (Existing, New, or Modified)  
 Source Bus Name ... LOAD 544 TERM  
 Motor Rated Volts ..... 480.0  
 Rated hp, kW, or kVA ..... 60.0      \*\*\* Load Brake Power \*\*\*  
 Units (hp,kW, or kVA) .... KW      Cond 1 : 48.4 KW  
 Load Type (I,S,G or R) ... R      Cond 2 : 47.1 KW  
 Rated Efficiency (%) ..... 100.0      Cond 3 : 48.4 KW  
 Rated Power Factor (%) ... 100.0      Cond 4 : 48.4 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) ..... No

Routing:

Comments:

22

Prepared by: \_\_\_\_\_

Reviewed by: \_\_\_\_\_

Approved by: \_\_\_\_\_

\*\*\* Sargent &amp; Lundy -- ELMS-AC Program \*\*\*

Utility : Sargent & Lundy Internal Use  
 Station : QUAD CITIES-FILE:S2.DAT

Project No. : 8913-73  
 Unit No. 2

Calc. No. 8913-73-19-1  
 Rev. 0  
 Project No. 8913-73  
 Page B14 of

## AC Load Ticket

Record Number # 551

Equip. No. / Load Name ... 250VDC BATTERY CHARGER #2  
 Status (E, N, or M) ..... E (Existing, New, or Modified)  
 Source Bus Name ..... LOAD 551 TERM  
 Motor Rated Volts/..... 480.0  
 Rated hp, kW, or kVA ..... 93.9 \*\*\* Load Brake Power \*\*\*  
 Units (hp, kW, or kVA) .... KVA  
 Load Type (L, 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 : 83.0 KVA  
 Cond 2 : 81.4 KVA  
 Cond 3 : 33.5 KVA  
 Cond 4 : 83.5 KVA  
 Cond 5 : 0.0 KVA

Routing:

Comments:

Prepared by: \_\_\_\_\_

Viewed by: \_\_\_\_\_

Approved by: \_\_\_\_\_



184363

\*\*\* Sargent &amp; Lundy -- ELMS-AC Program \*\*\*

Utility : Sargent & Lundy Internal Use  
 Station : QUAD CITIES-FILE:S2.DAT

Project No. : 8913-73  
 Unit No. 2

Calc. No. 8913-73-19-1  
 Rev. 2  
 Project No. 8913-73  
 Page B15 of

## AC Load Ticket

Record Number 553

Equip. No. / Load Name ... 125VDC BATTERY CHARGER #2  
 Status (E,N, or M) ..... E (Existing, New, or Modified)  
 Source Bus Name ..... LOAD 553 TERM  
 Motor Rated Volts ..... 480.0  
 Rated hp, kW, or kVA ..... 39.9 \*\*\* Load Brake Power \*\*\*  
 Units (hp,kW, or kVA) .... KVA Cond 1 : 35.5 KVA  
 Load Type (I,S,G or R) ... R Cond 2 : 34.6 KVA  
 Rated Efficiency (%) ..... 100.0 Cond 3 : 35.5 KVA  
 Rated Power Factor (%) ... 95.0 Cond 4 : 35.5 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:

32

Prepared by: \_\_\_\_\_

Reviewed by: \_\_\_\_\_

Approved by: \_\_\_\_\_



\*\*\* Sargent &amp; Lundy -- ELMS-AC Program \*\*\*

Utility : Sargent & Lundy Internal Use  
 Station : QUAD CITIES-FILE:S2.DAT

Project No. : 8913-73  
 Unit No. 2

Calc. No. 8913-73-19-1  
 REV. 0  
 Project No. 8913-73  
 Page B16 of

## AC Load Ticket

\*\*\*\*\*

Record Number = 577

Equip. No. / Load Name ... 1/2-7503A SGBT AIR HTRS  
 Status (E,W, or M) ..... E (Existing, New, or Modified)  
 Source Bus Name ..... LOAD 577 TERM  
 Motor Rated Volts ..... 480.0  
 Rated hp, kW, or kVA ..... 30.0 \*\*\* Load Brake Power \*\*\*  
 Units (hp, kW, or kVA) .... KW      Cond 1 : 24.6 KW  
 Load Type (I, S, G or R) ... R      Cond 2 : 23.7 KW  
 Rated Efficiency (%) ..... 100.0      Cond 3 : 24.6 KW  
 Rated Power Factor (%) ... 100.0      Cond 4 : 24.6 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:

32

repared by: \_\_\_\_\_

eviewed by: \_\_\_\_\_

proved by: \_\_\_\_\_

184363

Calc. No. 8913-73-14-1

Rev. 0

Project No. 8913-73

Page B17 of

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

Motor Number	Motor Name
-----------------	---------------

556		RHR SW PMP 2C CLR FAN A
557		RHRS SW PMP 2C CLR FAN B
558		RHR SW PMP 2C CLR FAN C
559		RHR SW PMP 2C CLR FAN D
562		RHR SW PMP 2D CLR FAN A
563		RHR SW PMP 2D CLR FAN B
564		RHR SW PMP 2D CLR FAN C
565		RHR SW PMP 2D CLR FAN D
583	2-1001-26B	RHRS CONT SPRY SHTOF ISOVLV
584	2-1001-23B	RHRS BACKUP CONT SPRY VLV2B
585	1001-34B	RHR MN SHTOF TO SPRN CH VLV
586	2-1001-36B	RHRS SPRN CH DMPLN VLV 2B

184363

Calc. No. 8913-73-1-1

Rev. 0

Project No. 8913-73

Page 818 of *FINAL*

SARGENT & LUNDY ELMS-AC ** MOTOR START VOLTAGE SUMMARY ** SOURCE : 3 COND : 2				
INTERNAL		BUS RUNNING	BUS RATED	% OF
BUS NUMBER	BUS NAME	VOLTS	VOLTS	RATED
3	SOURCE Equivalent Source	3820.1	4160.0	91.8
15	4KV SWGR 24-1	3820.0	4160.0	91.8
28	HIGH SIDE OF XFMR 29	3819.2	4160.0	91.8
29	480V SWGR 29	430.1	480.0	89.6
53	480V MCC 29-1	425.3	480.0	88.6
54	480V MCC 29-2	416.3	480.0	86.7
55	480V MCC 29-3	423.9	480.0	88.3
56	480V MCC 29-4	427.0	480.0	89.0
57	480V MCC 28/29-5	430.1	480.0	89.6
58	480V MCC 29-6	430.1	480.0	89.6
70	LOAD 518 TERM	394.5	480.0	82.2
71	LOAD 519 TERM	410.9	480.0	85.6
72	LOAD 520 TERM	425.3	480.0	88.6
73	LOAD 521 TERM	425.3	480.0	88.6
74	LOAD 523 TERM	425.3	480.0	88.6
75	LOAD 524 TERM	406.0	480.0	84.6
76	LOAD 529 TERM	425.3	480.0	88.6
77	LOAD 530 TERM	425.3	480.0	88.6
78	LOAD 532 TERM	423.0	480.0	88.1
79	LOAD 533 TERM	425.3	480.0	88.6
80	LOAD 542 TERM	425.3	480.0	88.6
81	LOAD 543 TERM	425.3	480.0	88.6
82	LOAD 544 TERM	415.2	480.0	86.5
83	LOAD 516 TERM	416.0	480.0	86.7
84	LOAD 550 TERM	410.8	480.0	85.6
85	LOAD 552 TERM	411.0	480.0	85.6
86	LOAD 551 TERM	405.0	480.0	84.4
87	LOAD 553 TERM	414.1	480.0	86.3
88	LOAD 560 TERM	406.3	480.0	84.6
89	LOAD 561 TERM	406.3	480.0	84.6
90	LOAD 567 TERM	416.3	480.0	86.7
91	LOAD 556 TERM	394.7	480.0	82.2
92	LOAD 577 TERM	417.2	480.0	86.9
93	LOAD 578 TERM	411.9	480.0	85.8
94	LOAD 580 TERM	427.0	480.0	89.0
95	LOAD 581 TERM	427.0	480.0	89.0
96	LOAD 582 TERM	427.0	480.0	89.0
97	LOAD 527 TERM	414.0	480.0	86.3