Entergy Nuclear South
Entergy Operations, Inc.
17265 River Road
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Joseph A. Kowalewski
Vice President, Operations
Waterford 3

W3F1-2010-0050

June 8, 2010

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: Response to Request for Additional Information Associated with Technical Specification Table 3.4-1 Isolation Valve Addition
Waterford Steam Electric Station Unit 3
Docket No. 50-382
License No. NPF-38

REFERENCES:
1. W3F1-2010-0019, Technical Specification Table 3.4-1 Isolation Valve Addition, February 22, 2010.
2. NRC Letter, Request for Additional Information Re: Technical Specification Table 3.4-1 Isolation Valve Addition, April 14, 2010 [ADAMS Accession Number ML101040651].

Dear Sir or Madam:

In Reference 1, Entergy Operations, Inc. (Entergy) proposed a change to Waterford Steam Electric Station Unit 3 (Waterford 3) Technical Specifications (TS) Table 3.4-1 Isolation Valve Addition.

During the submittal review process, the Nuclear Regulatory Commission (NRC) determined that a Request for Additional Information (RAI) was required to complete the review of the Entergy request (Reference 2).

A001
NRR

The response to the RAI is included in Attachment 1 to this letter. This letter contains no new commitments.

If you have any questions or require additional information, please contact William Steelman at 504-739-6685.

I declare under penalty of perjury that the foregoing is true and correct. Executed on June 8, 2010.

Sincerely,

JAK/WJS

Attachment: Response to Request for Additional Information

cc: Mr. Elmo E. Collins, Jr.
Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
612 E. Lamar Blvd., Suite 400
Arlington, TX 76011-4125

NRC Senior Resident Inspector
Waterford Steam Electric Station Unit 3
P.O. Box 822
Killona, LA 70066-0751

U. S. Nuclear Regulatory Commission
Attn: Mr. N. Kalyanam
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Washington, DC 20555-0001

Wise, Carter, Child & Caraway
ATTN: J. Smith
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Jackson, MS 39205

Winston & Strawn
ATTN: N.S. Reynolds
1700 K Street, NW
Washington, DC 20006-3817

Morgan, Lewis & Bockius LLP
ATTN: T.C. Poindexter
1111 Pennsylvania Avenue, NW
Washington, DC 20004

Attachment to

W3F1-2010-0050

Response to Request for Additional Information

NRC REQUEST FOR ADDITIONAL INFORMATION

In Reference 1, Entergy Operations, Inc. (Entergy) proposed a change to Waterford Steam Electric Station Unit 3 (Waterford 3) Technical Specifications (TS) Table 3.4-1 Isolation Valve Addition. During the submittal review process, the Nuclear Regulatory Commission (NRC) determined that a Request for Additional Information (RAI) was required to complete the review of the Entergy request (Reference 2).

The following lists the Waterford 3 NRC RAIs and responses.

RAI 1

Provide name plate ratings and procurement details of the solenoid valves.

RAI 1 Response

The preliminary valve drawing no. 2141673xx (attached) from the manufacturer (Valcor) reflects a nameplate primary pressure rating of Class 1717 and pressure boundary design of 2485 psig at 650 deg. F. The solenoid valves are being procured in accordance with Waterford-3 Specification 1564.110A (Control Valves & Accessories & Line Service Solenoid Valves Safety Class 1, 2, 3 & Non-nuclear Safety Class). Procurement requirements / details are as follows: 3/4" Diameter, Schedule 160, Socket Weld, Class 1E qualified to IEEE-323, ASME III, Class 1, Seismic Cat. 1, Borated Water Service, Stainless Steel Body, EGS type ECSA Conduit Seal, Radiation Environment 5.1 x 10^7 rads, with independent limit switches (2) normally open and (2) normally closed.

RAI 2

Provide the electrical one line and applicable schematic drawings showing the power and control circuits for valves SI-4052A and SI-4052B.

RAI 2 Response

Drawing G287 sheet 1 is the electrical one line diagram for the DC control power (3A-DC-S and 3B-DC-S) and 120VAC Static Uninterruptible Power Supply (SUPS) 3A-S and 3B-S.

Drawings B424 Sheets 596, E596, 595, and E595 are the schematic drawings showing the power for valve SI-4052A and its indication lights.

Drawings B424 Sheets 591, E591, 590, and E590 are the schematic drawings showing the power for valve SI-4052B and its indication lights.

These drawings are attached to this response.

RAI 3

Provide a summary of the voltage drop calculation including circuit lengths and the cable design details. Also, explain how the cables are routed from the distribution panels to the valves and the criteria used to meet electrical separation, independence, and redundancy requirements.

RAI 3 Response

The voltage drop calculation determines that the Power Distribution Panels (PDP's) 3A-S and 3B-S have sufficient voltage to assure that the new solenoids can operate properly. The lowest design voltages at SI-4052A and SI-4052B are 96.9Vdc and 98.7Vdc, respectively. The existing loads along with SI-405A (B) also remain above the minimum voltage required after the addition of the new solenoid valves, SI-4052A and SI-4052B. The new solenoid valve has an operating voltage rating range of 90V – 140V and a full load current rating of 1.5A.

The original controls for SI-405A(B) were modified by Engineering Change (EC) 935 to eliminate the Control Room CP-8 test switches and test indicating lights. The spared conductors (Class 1E) for cables associated with existing SI-405A(B) will be used for the new solenoid. These cables are routed from the Control Room Panel CP-8, located in the Reactor Auxiliary Building (RAB) +46 Elevation to the Auxiliary Relay Panel A (B), located in the RAB +35 Elevation, to the containment electrical penetrations RAB +35 Elevation and terminated at the solenoids located inside the Reactor Containment Building +21 Elevation.

Class 1E spare cables between the Remote Shutdown Panel LCP-43 and the Auxiliary Relay Panel A (B) are used for the new solenoid. This portion of the circuit is associated with controlling the valves from the alternate shutdown panel during a control room evacuation event. The cable lengths between the LCP-43 and the Auxiliary Relay Panel A and B are 115 feet and 55 feet, respectively.

These cable are class 1E and are routed in safety related raceway that meet all separation, independence, and redundancy requirements in accordance with Regulatory guide 1.75 "Criteria for Independence of Electrical Safety Systems" and IEEE-384 "Criteria for Separation of Class 1E Equipment and Circuits". Train A and Train B are independent of each other with regard to power requirement and train separation requirement.

The cable length between the Control Room and Auxiliary Relay Panel A is 110 feet. The cable length between Auxiliary Relay Panel A and containment electrical penetration is approximately 335 feet. The cable length between containment electrical penetration and the solenoid is approximately 260 feet.

Similarly, the cable length between the Control Room and Auxiliary Relay Panel B is 90 feet. The cable length between Auxiliary Relay Panel B and containment electrical

penetration is approximately 160 feet. The cable length between containment electrical penetration and the solenoid is approximately 260 feet.

RAI 4

Provide a summary of the loading calculations that indicates battery and power distribution panels have acceptable margin available for this modification.

RAI 4 Response

Two calculations associated with safety related Battery 3A-S are ECE91-061 "Battery 3A-S Cell Sizing" and ECE91-058 "Battery 3A-S Calculation for Station Blackout". Likewise, the two calculations associated with safety related Battery 3B-S are ECE91-062 "Battery 3B-S Cell Sizing" and ECE91-059 "Battery 3B-S Calculation for Station Blackout." The Power Distribution Panel (PDP) loading calculations for PDP-3A1-DC-S and PDP-3B1-DC-S are ECE91-193 and ECE91-194, respectively.

The purpose of ECE91-061 is to ensure that Waterford 3 has adequate battery capacity to power DC loads during a design basis accident and a loss of offsite power (LOOP). The Emergency Diesel Generator starts within 10 seconds of a LOOP and provides power to the two safety related Battery Chargers via the load sequencer relay 7 seconds upon restoration of AC power. Therefore, the calculation analyzes the Battery to provide power to the associated DC buses for a bounding time of 1 minute. Shutdown cooling is not commenced during the first minute of the LOOP event. Hence, the new solenoid SI-4052A will not be energized (i.e. to open) which will not impact the loading on the battery.

The purpose of ECE91-058 is to ensure that Waterford 3 has adequate battery capacity to support decay heat removal (natural recirculation) during a Station Blackout for a 4-hour coping duration. The new solenoid SI-4052A will not be energized during natural recirculation and hence will not impact the loading on the battery.

Each train of safety related battery at Waterford 3 has 60 cells with an 8-hour rating of 2320 ampere hours at 1.75 end cell voltage. Two auxiliary relays, rated at 0.082 FLA, are added for the control circuit on SI-4052A. The indicating lights on the valves SI-405A are removed from the battery. The net change is an increase of 0.002A, which has insignificant impact on the battery margin.

Same analysis on Battery 3B-S is applicable for SI-4052B.

The PDP panels are rated for 400 amps. The PDP-3A1-DC-S capacity is approximately 48% of its rating and PDP-3B1-DC-S is approximately 53% of its rating. This change increases the PDP load by less than one amp and is well within the available PDP capacity margin.

RAI 5

Provide a summary of the calculations that indicates Static Uninterruptible Power Supplies (SUPS) 3A-S and 3B-S and power distribution panels have acceptable margin available for this modification.

RAI 5 Response

The loading calculations for SUPS 3A-S, SUPS 3B-S, Power Distribution Panel (PDP) 390-SA, and PDP-391-SB are ECE91-176 and ECE91-177, respectively. SUPS 3A-S and 3B-S are rated at 20kVA. The load on SUPS 3A-S is approximately 31% of its rating and the load on SUPS 3B-S is approximately 27%. The PDP panels are rated for 100 amps. The PDP-390-SA is approximately 52% of its rating and PDP-391-SB is approximately 46% of its rating. The indicating lights for SI-4052A (B) will be powered from SUPS 3A-S and 3B-S. A total of 0.016 FLA will be added to each SUPS and PDP, which has insignificant impact on the SUPS and PDP margin.

RAI 6a

Describe the environmental parameters for the valves and cables including their physical locations.

RAI 6a Response

The following environmental parameters are defined in Environmental Zone Map drawings G-M-0001, G-M-0002, G-M-0004, G-M-0009, and G-M-0012.

Normal Service Conditions

a. Temperature	120°F Normal Inside Containment 104°F Normal Outside Containment
b. Pressure:	14.7 psia Nominal
c. Radiation (40 year):	0.31 Mrad Gamma Inside Containment (Air Equivalent)
d. Relative Humidity:	20% to 90%
Plant Design Basis Events	(Worst Case)
a. Accident Temperature:	414°F Maximum Inside Containment (MSLB) 269°F Maximum Inside Containment (LOCA) 150°F for 4 hours Maximum Outside Containment

b. Accident Pressure:	44 psig Maximum Inside Containment 14.7 psia Maximum Outside Containment
c. Accident Type	MSLB & LOCA (with Loss of Offsite Power for 4 Hours)
d. Required Operating Time	120 days post accident
e. Radiation:	33 Mrads Gamma (Air Equivalent) Inside Containment 330 Mrads Beta Inside Containment
f. Relative Humidity:	100% Maximum Inside Containment 20% to 90% Outside Containment
g. Submergence:	None
h. Chemical Spray:	Yes: Inside Containment Only

The Bypass Line installed around valves SI-405A(B) including solenoid valves SI-4052A(B) will be located in the Reactor Containment Building Elev. +21 outside the D-ring. The cables will be located in the Reactor Auxiliary Building, control room, and containment.

RAI 6b

Explain how these components are qualified to meet the requirements of 10 CFR 50.49 for the environmental conditions they are expected to be exposed to. Also, provide a summary of the environmental qualification reports including the accident profiles.

RAI 6b Response

The EQ solenoid valves to be installed under Engineering Changes (ECs) 14765, 14766 and 14767 are currently in the procurement process and will meet 1564.110A Rev.15 specification which envelopes the environmental requirements. EC 14765 states the modification installation shall not commence until an EQ assessment is developed and approved since vendor documentation to validate qualification is not available at this time. In addition to EC 14765 tracking qualification of these components, Action Request AR 84956-03 has been generated to evaluate the manufacturers EQ documentation ensuring the 10 CFR 50.49 requirements and the site requirements are satisfied. In addition, Waterford 3 submittal letter W3F1-2010-0019 Attachment 4 contains the following commitment:

> SI-4052A(B) will be procured to withstand the environmental and accident conditions inside containment as shown in FSAR Table 3.11-1.

RAI 7

Provide a summary of the protective device coordination of the circuits including the respective containment penetrations for valves SI-4052A and SI-4052B.

RAI 7 Response

The new solenoid valve, SI-4052A(B), will be added in parallel with valve SI-405A (B) and will be fed from 125V dc control power, which is the same circuit that provides control power to SI-405A(B). The electrical penetrations (141 and 142) associated with these circuits are protected by double protections (two fuses) which currently meet the requirement of Technical Specification 3/4.8.4.

The valve position indication lights for SI-4052A(B) and SI-405A(B) will be powered separately from the control circuit power for the same shutdown loop's valves SI-401A(B). The electrical penetrations (141 and 142) associated with these circuits are protected by double protections (breaker/fuse) which are currently tested in accordance with Technical Specification surveillance 4.8.4.1.

REFERENCES

1. W3F1-2010-0019, Technical Specification Table 3.4-1 Isolation Valve Addition, February 22, 2010.
2. NRC Letter, Request for Additional Information Re: Technical Specification Table 3.4-1 Isolation Valve Addition, April 14, 2010 [ADAMS Accession Number ML101040651].
3. NRC Letter, Acceptance Review for Technical Specification Table 3.4-1 Isolation Valve Addition, March 23, 2010 [ADAMS Accession Number ML100820566].

DESIGN/PERFORMANCE

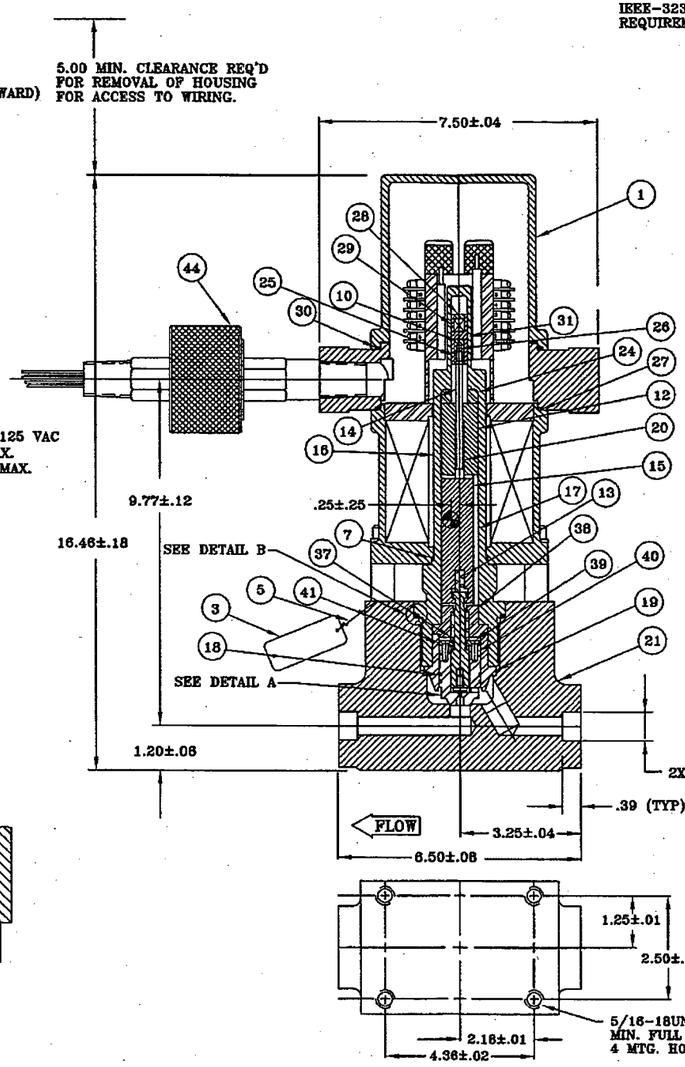
1. FLUID_____ BORATED
2. DESIGN & OPERATIONAL CONDITIONS
   - PRIMARY PRESSURE RATING_____ CLASS 1717
   - PRESSURE BOUNDARY DESIGN_____ 2485 PSIG AT 650°F
   - NORMAL OPERATIONAL DESIGN_____ 2350 PSIG AT 560°F
3. FLOW_____ Cv=4.0 MIN.
4. HYDROSTATIC CONDITIONS
   - SHELL LEAKAGE_____ ZERO AT 6200 PSIG WATER & 70°F
   - DISC LEAKAGE_____ .125 cc/MIN. WATER AT 4535 PSIG WATER & 70°F (FORWARD)
5. SOLENOID OPERATOR
   - COIL INSULATION_____ CLASS H
   - ENCLOSURE RATING____ NEMA 4
   - VOLTAGE_____ 90-140 VDC
   - CURRENT INRUSH_____ 1.5 AMP MAX. AT 125VDC & 70°F
   - HOLDING_____ 1.5 AMP MAX. AT 125VDC & 70°F
   - DUTY_____ CONTINUOUS AT 125VDC MAX.
6. FAILURE POSITION___ CLOSED
7. WEIGHT_____ 65 LBS. MAX. (WEIGHT DOES NOT INCLUDE PIGTAILS)
8. INSTALLATION HEAT TRANSFER DUE TO IN-LINE WELDING SHALL BE MINIMIZED SUCH THAT MAX. BODY TEMPERATURE WITHIN 1" OF WELD SHALL NOT EXCEED 400°F.
9. RADIATION ENVIRONMENT
   GAMMA RADIATION INTEGRATED DOSAGE OF 5.1 X 10^7 RADS
10. CODE COMPLIANCE
    ASME SECT. III 1977 EDITION INCLUDING SUMMER 1977 ADDENDA
    CLASS 1 DESIGN
11. POSITION INDICATION___ MAGNETIC REED SWITCH___ SWITCHING VOLTAGE___ 125 VDC OR 125 VAC
    SWITCHING CURRENT___ .50 AMPS MAX.
    SWITCHING CAPABILITY___ 60 WATTS MAX.
12. CUSTOMER DOCUMENTS
    a) WATERFORD 3

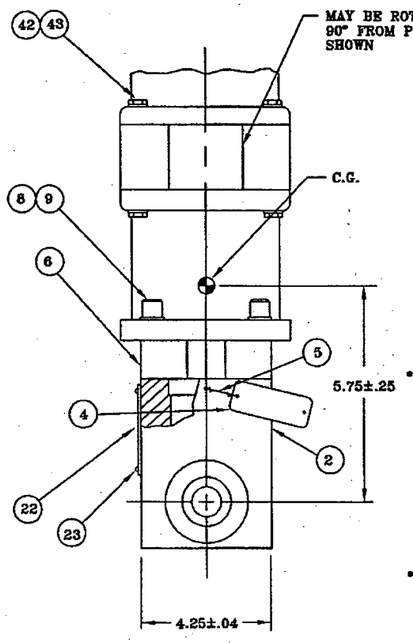
    b) TAG NUMBERS:
    SI-4052A
    SI-4052B

10 LEADWIRES 30 FT. LONG MIN.
#16 AWG SOLID COPPER CONDUCTOR,
POLYMIDE INSULATED, 600 VOLT 200°C
FIREWALL III SIS

OWNER IS RESPONSIBLE FOR MAINTAINING THE SEALS, ITEMS 7, 27 & 30 AND FOR SEALING THE CONDUIT CONNECTION AND PREVENTING THE ENTRANCE OF MOISTURE THRU THE CONDUIT TO MAINTAIN THE VALIDITY OF THE IEEE-323 QUALIFICATION AND THE REQUIREMENTS OF THE NEMA 4 ENCLOSURE.

REVISIONS				
ECO	LTR	DESCRIPTION	DATE	APPROVED





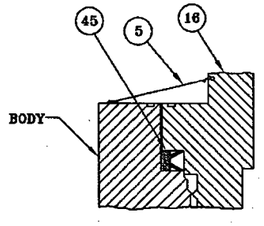
THIS DRAWING IS FOR PROPOSAL PURPOSES ONLY

ALL DIMENSIONS ARE FOR REFERENCE ONLY

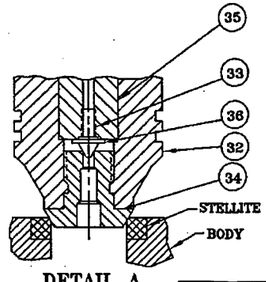
* PRESSURE RETAINING PARTS

ITEM	DESCRIPTION	MATERIAL
45	K-SEAL	INCONEL X750
44	CONNECTOR	EGS
43	LOCKWASHER	300 SERIES ST. STL.
42	SCREW, HEX HD.	300 SERIES ST. STL.
41	PLATE	ASTM A276 TYPE 316
40	HELI-COIL	300 SERIES ST. STL.
39	SCREW, FLAT HD.	300 SERIES ST. STL.
38	RING	ASTM A276 TYPE 316
37	SPRING	ELGILOY
36	SEAL	STELLITE 6B
35	POPPET	ASTM A479 TYPE 316
34	SEAL	STELLITE 6B
33	HELI-COIL	300 SERIES ST. STL.
32	DISC	ASME SA-479 TYPE 316
31	CUP	ASTM A479 TYPE 316
30	O-RING	SILICONE
29	MAGNET	REMCO-16
28	PLUG	ASTM A479 TYPE 316
27	O-RING	SILICONE
26	LOCKPIN	300 SERIES ST. STL.
25	COUPLING	ASTM A479 TYPE 316
24	SPACER	ASTM A276 TYPE 316
23	SCREW, DRIVE	300 SERIES ST. STL.
22	NAMEPLATE	302 OR 304 ST. STL.
21	BODY	ASME SA-240 TYPE 316
20	SPRING	ELGILOY
19	GUIDE	ASTM A276 TYPE 316
18	PISTON RING	410 ST. STL.
17	PIN	ASTM A479 TYPE 316
16	BONNET	ASME SA-479 TYPE 316
15	PLUNGER	430/ VALCOR STD. S121
14	ROD	ASTM A479 TYPE 316
13	SPRING	ELGILOY
12	STOP	430/ VALCOR STD. S121
11		
10	SPIROL PIN	INCONEL X-750
9	SCREW, CAP, SOC. HD.	300 SERIES ST. STL.
8	LOCKWASHER	302 OR 304 ST. STL.
7	PACKING	GRAFOIL
6	SPACER	300 SERIES ST. STL.
5	LOCKWIRE	302 OR 304 ST. STL.
4	VALVE TAG	300 SERIES ST. STL.
3	WELD CAUTION TAG	300 SERIES ST. STL.
2	VALVE ASSY	//
1	SOLENOID ASSY	//

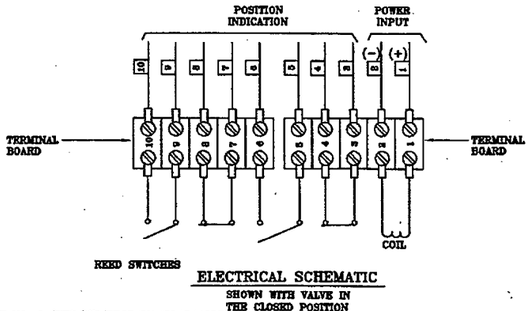
LIST OF MATERIALS



DETAIL B

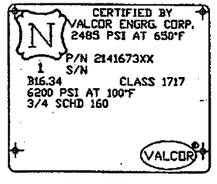


DETAIL A



ELECTRICAL SCHEMATIC

SHOWN WITH VALVE IN THE CLOSED POSITION



NAMEPLATE INFO.

VALCOR ENGINEERING CORP.
SPRINGFIELD, N.J.
SOLENOID OPERATOR
VOLTAGE: 125VDC
ENCLOSURE NEMA TYPE 4
P/N V105-394-XX

SOLENOID NAMEPLATE INFO.

NUCLEAR HARDWARE

SIGNATURES	DATE
DRAWN B. KARCH	4/30/10
CHECKED	
ENGINEER	
PRODUCTION	
APPROVED	
APPROVED	
APPROVED	

VALCOR ENGINEERING CORPORATION
SPRINGFIELD, NEW JERSEY

3/4 SCHD 160 CLASS 1717 D.C.

VALVE, SOLENOID, POSITION INDICATION, NUCLEAR SERVICE

MODEL: V526-6048-XX N.C.

SIZE	CODE IDENT. NO.	DWG. NO. & PART NO.
D	96487	2141673XX

SCALE -/- | COMP. NO. | SHT 1/1

PROPOSAL NO. NA092/402

FILE NO: O:/DWG/NU/PROP/NA/09/2/402C

THIS PAGE IS AN OVERSIZED DRAWING OR FIGURE,

THAT CAN BE VIEWED AT THE RECORD TITLED: "LOUISIANA POWER & LIGHT COMPANY, WATERFORD S.E.S. UNIT NO.3, 1977-1165 MW INSTALLATION 125 VDC AND 120 VAC ONE LINE DIAGRAM, G287, SH.1" WITHIN THIS PACKAGE...OR BY SEARCHING USING THE DOCUMENT/REPORT NO.

D-01X

Engineering Change Markup	EC#: 14766	Page 2 of 2
DOC#: B424		SHT#: 596 REV 21
Safety Related: ☒	Before View ☐	Control Room Drawing: ☒
Prepared By:	03/19/10 Date	Reviewer Name (Optional)

LCP-43(-9577)

RTGB-CP8(X-875)

125V DC, PDP-3A1-DC
CKT. #7, SI-EBKR-1A-7
FUSIBLE DISCONNECT SWITCHES
BOTH + AND -

NOTE:
FOR SWITCH DEVELOPMENTS SEE
SH. E596.

ADD

ADD

(X-1366,-1369)
(AD)
AUX
PNL 1

ISOL. PNL

JUNCTION BOX-1, SH. 595, 599

ANN(CP-19)
BAY 6

AIR PRESSURE LO
SI-IPS-0405A1
(PS-1)

AIR PRESSURE LO-LO
SI-IPS-0405A2
(PS-2)

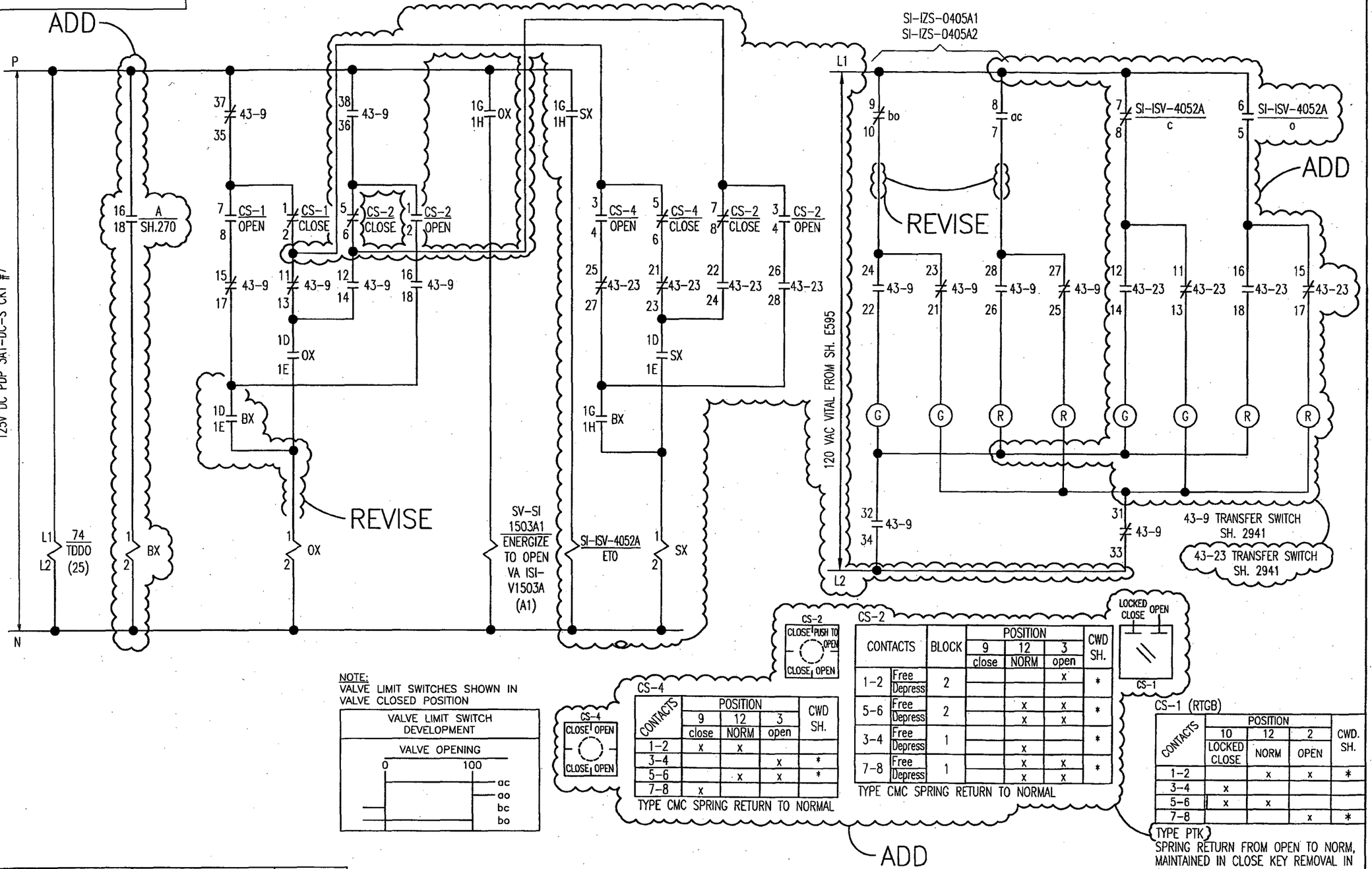
NOTE. FOR COMPUTER INPUTS
SEE CWD SH 2838

REV.	DATE	BY	APPROVAL
21	6-5-08	JAG	DD. DD
20	4-6-95	DD	THS CB
19	10-2-91	MU CB	LFP TMG EF
18	11-8-91	EJB	VL
17	10-5-91		

EBASCO SERVICES INCORPORATED
NEW YORK
DIV. I&C DR. REL
H.J. TYMANIC
DATE NOV 12, 1976
APPROVED

LOUISIANA POWER & LIGHT CO.
WATERFORD S.E.S. UNIT No.3
CONTROL WIRING DIAGRAM
RCS LOOP 2 SHUTDOWN COOLING
ISOLATION VA. ISI-1503A

B424
SHEET 596



NOTE:
VALVE LIMIT SWITCHES SHOWN IN VALVE CLOSED POSITION

VALVE LIMIT SWITCH DEVELOPMENT

CS-4

CONTACTS	POSITION 9 close	POSITION 12 NORM	POSITION 3 open	CWD SH.
1-2	x	x		
3-4			x	*
5-6		x	x	*
7-8	x			

TYPE CMC SPRING RETURN TO NORMAL

CS-2

CONTACTS		BLOCK	POSITION 9 close	POSITION 12 NORM	POSITION 3 open	CWD SH.
1-2	Free	2			x	*
	Depress					
5-6	Free	2		x	x	*
	Depress			x	x	
3-4	Free	1				*
	Depress			x		
7-8	Free	1		x	x	*
	Depress			x	x	

TYPE CMC SPRING RETURN TO NORMAL

CS-1

CS-1 (RTGB)

CONTACTS	POSITION 10 LOCKED CLOSE	POSITION 12 NORM	POSITION 2 OPEN	CWD. SH.
1-2		x	x	*
3-4	x			
5-6	x	x		
7-8			x	*

TYPE PTK
SPRING RETURN FROM OPEN TO NORM, MAINTAINED IN CLOSE KEY REMOVAL IN CLOSE POS ONLY

* THIS SHEET

ADD

Engineering Change Markup	EC#: 14766	Page 2 of 2
DOC#: B424	SHT#: E596	REV 4
Safety Related: ☒	Before View ☐	Control Room Drawing: ☒
Prepared By:	03/19/10 Date	Reviewer Name (Optional)

(G-167-2)

REV.	DATE	BY	APPROVAL

REV	DATE	CH	APPROVED
4	6-5-08	JAG	DD DD
3	10-2-91	ML HO	LFP CB TMS EF
2	10/22/90	DLH	VI
1	7-2-87	DL	

EBASCO SERVICES INCORPORATED
DIV I & C DR DS
CH S. LIN
DATE JAN. 9, 1980
APPROVED

LOUISIANA POWER & LIGHT CO.
WATERFORD S.E.S. UNIT NO.3
CONTROL WIRING DIAGRAM
RCS LOOP 2 SHUTDOWN COOLING
ISOLATION VA ISI-V1503A

B424
SHEET E596

REFERENCE ELEMENTARY CWD

AUX PNL-1 (AG)(X-1369,-1368,1462)

LCP-43 (-9577)

ADD (SH.596)

120V AC VITAL 9H-652

416.0V SWGR 3A3-S5 (-6328)

F-SA

L-SA

E-SA

G-SA

IA-T3 IA-T4

LOCKED CLOSE OPEN CS-1

CONTACTS	POSITION 10 CLOSE	12 NORM	2 OPEN	CWD SH
1-2		X	X	#
3-4	X			#*
5-6	X	X		#
7-8			X	*

TYPE PTK # THIS SHEET SPRING RETURN TO NORM FROM OPEN, MAINTAINED IN CLOSE, KEY REMOVABLE IN CLOSE POSITION ONLY.

RCS LOOP 2 SHDN CLG UPSTRM ISOL VA IN

NOTE:

CS-2

CONTACTS	POSITION 9 CLOSE	12 NORM	3 OPEN	CWD SH.
1-2	X	X		*
3-4			X	*
5-6		X	X	*
7-8	X			*

TYPE CMC # THIS SHEET SPRING RETURN TO NORM

ANN (CP-19) BAY 6 M0107

SI-EBKR-311A-8D

SI-EMTR-311A-8D

SI-EQL-311A-8D-2

SI-EHTR-311A-8D-1

SI-EHTR-311A-8D-2

40W MAX MTR SPACE HEATER

25W MAX SPACE HEATER

MOTOR (SI-652)

REACTOR AUX BLDG 480V MCC 3A311-S COMPT 8D

JUNCT BOX-1 X-13640

AUX PNL-1 (AA) SH269

REVISE VA LIMIT SW

SI-I2S-0401A

LIMIT SW DEVELOPMENT

EBASCO SYM	CONT	VALVE OPNG % 0 100	CWD SH.
bo	1-2		*
ac	3-4		*
bo	5-6		*
ac	7-8		
ao	9-10		*
bc	11-12		2836
ao	13-14		2836
bc	15-16		*
ax	17-18		
bx	19-20		*'
ax	21-22		
bx	23-24		
bx	25-26		*
ax	27-28		
bx	29-30		
ax	31-32		
TC	35-36	OPENS ON OLVD ON CLOSE STRK	*
TQ	45-46	OPENS ON OLVD ON OPEN STRK	*

CONT CLOSED * = THIS SHEET

G-167-2

Engineering Change Markup	EC#: 14766	Page 2 of 2
DOC#: B424	SHT#: 595	REV 28

Safety Related: ☒ | Before View ☐ | Control Room Drawing: ☒

Prepared By: | 10/03/09 Date | Reviewer Name (Optional): for DAS

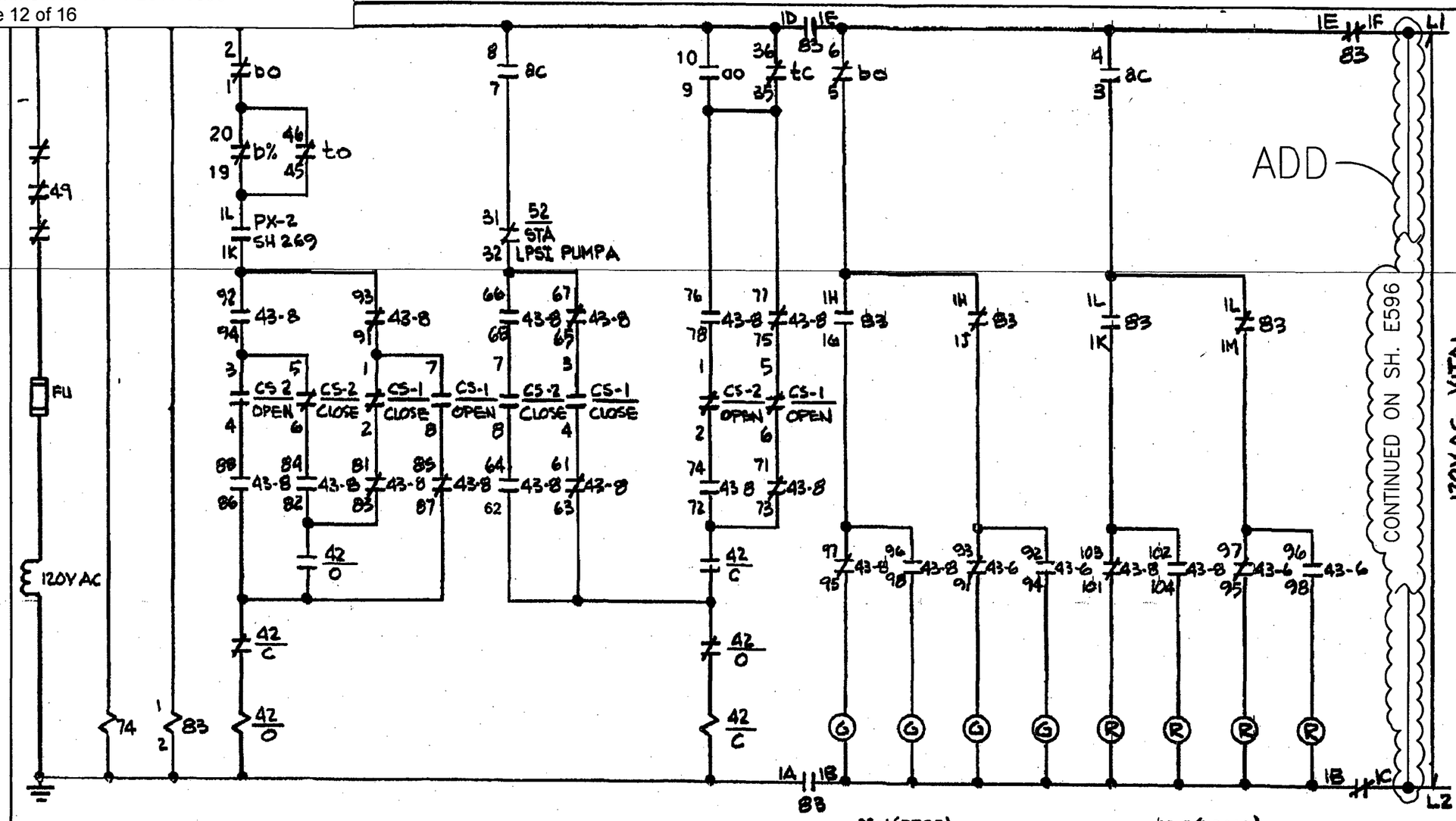
REV.	DATE	BY	APPROVAL

REV	DATE	BY	APPROVED
28	6-5-08	JAG	DD
27	9-21-95	LLB	ML
26	2-10-95	DDD	THS
25	8-17-93	THS	DDD

EBASCO SERVICES INCORPORATED NEW YORK

LOUISIANA POWER & LIGHT CO.
WATERFORD S.E.S. UNIT No.3
CONTROL WIRING DIAGRAM
RCS LOOP No.2 SHUTDOWN COOLING ISOL VA1SI-V1504A

B424
SHEET 595



CS-1 (RTGB)

CONTACTS	POSITION 1D CLOSE	12 NORM	2 OPEN	CWD SH.
1-2		X	X	*
3-4	X			*
5-6	X	X		*
7-8			X	*

SPRING RETURN TO NORMAL FROM OPEN, MAINTAINED IN CLOSE, KEY REMOVABLE IN CLOSE POSITION ONLY

CS-2 (LOCAL)

CONTACTS	POSITION 9 CLOSE	12 NORM	3 OPEN	CWD SH.
1-2	X	X		*
3-4			X	*
5-6		X	X	*
7-8	X			*

SPRING RETURN TO NORMAL

LIMIT SWITCH DEVELOPMENT

EBASCO SYMBOL	CONT	VALVE OPNG % 0 ... 100	CWD SH.
bo	1-2		*
ao	3-4		*
bc	5-6		*
ac	7-8		*
ao	9-10		*
bc	11-12		2836
ao	13-14		2836
bo	15-16		585
a%	17-18		
b%	19-20		*
a%	21-22		
b%	23-24		
b%	25-26		585
a%	27-28		
b%	29-30		
a%	31-32		
to	35-36	OPENS ON OVERLOAD ON CLOSE STROKE	*
to	45-46	OPENS ON OVERLOAD ON OPEN STROKE	*

— CONT CLOSED

43-8 TRANSFER SWITCH SH. 2841
* THIS SHEET

Engineering Change Markup	EC#: 14766	Page 2 of 2
DOC#: B-424	SHT#: E595	REV 7
Safety Related ☒	Before View ☐	Control Room Drawing ☒
Prepared By:	02/16/10 Date	Reviewer Name (Optional)

This drawing was used in its entirety to scan and rasterize to produce this revision, REV 4

REV	DATE	CH	APPROVED
7	2-10-99	C	RJC
6	12-2-92	RJC	
5	10-2-91	LFP	TMG
4	10/22/90	DLH	VI
3	7-6-88		
2	12-29-87		
1	12-2-83		

INCORP. SMP-964 R1, 249 N1, 2034 R3
SMP-1493 R1

(G-167-2)

EBASCO SERVICES INCORPORATED
DIV I & C DR DS
CH S. LIN
DATE JAN. 9, 1980
APPROVED

LOUISIANA POWER & LIGHT CO.
WATERFORD S.E.S. UNIT NO. 3
CONTROL WIRING DIAGRAM
RCS LOOP 2 SHUTDOWN COOLING
ISOLATION VA 1S1-V1504A

LOU-1564
B-424
SHEET E595

Engineering Change Markup	EC#: 14767		Page 2 of 2
DOC#: B424		SHT#: 591	REV 25
Safety Related: ☒	Before View ☐	Control Room Drawing: ☒	
Prepared By:	03/19/10 Date	Reviewer Name (Optional)	

LCP-43(-9581)

RTGB-CP8(X-879)

125V DC, PDP-3B1-DCS
CKT. #9, SI-EBKR-1B-9
FUSIBLE DISCONNECT SWITCH
BOTH + AND -

NOTE:
FOR SWITCH DEVELOPMENTS SEE
SH. E591.

ADD

ADD

ANN(CP-19)
BAY 6

AUX
PNL 2

ISOL. PNL
NOTE: FOR COMP INPUTS
SEE CWD SH.2838
(G-167-2)

JUNCTION
BOX-1
SH. 590 &
594

SI-ISV
0405B1
SV-SI
1501B1
ETO
VA-SI-1501B

SI-ISV-4052B
ETO

AIR
PRESSURE LO
SI-IPS-0405B1
(PS-1)

AIR
PRESSURE LO-LO
SI-IPS-0405B2
(PS-2)

CS-3

BLOCK	CONTACTS	POSITION		CWD SH.
		1Ø	2	
		NORM	BYP	
1	1-2		X	*
	3-4	X		

TYPE PTK * THIS SHEET
MAINTAINED CONTACTS
KEY REMOVABLE IN NORM POSITION ONLY

NORM BYP

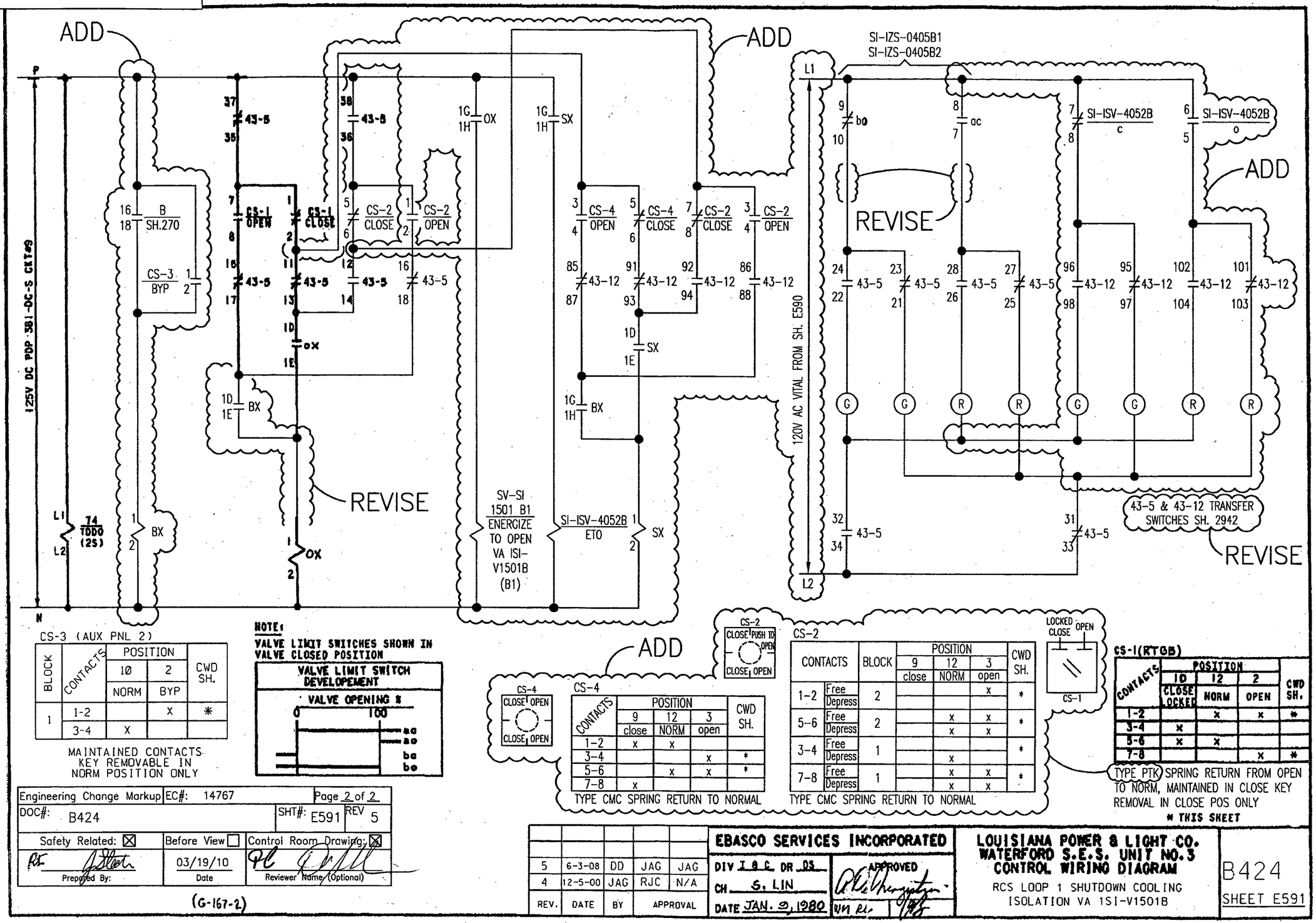
REV	DATE	BY	APPROVED
25	6-5-08	JAG	DD DD
24	12-5-00	JAG	RJC N/A
23	4-5-95	DD	THS CB
22	4-9-94	ML	LB N/A
21	10-3-91	ML HU	LFP CB TMG EF
20	8-16-90	MAM	JK MM
19	10-5-89	[illegible]	[illegible]

EBASCO SERVICES INCORPORATED
NEW YORK
DIV. I&C DR. REL
CH J.TYHANIC
DATE NOV 2, 1976
APPROVED

LOUISIANA POWER & LIGHT CO.
WATERFORD S.E.S. UNIT No.3
CONTROL WIRING DIAGRAM
RCS LOOP I SHUTDOWN COOLING
ISOLATION VA ISI-V1501B

B424
SHEET 591

FILENAME: IDEAS



CS-3 (AUX PNL 2)

BLOCK	CONTACTS	POSITION 10 NORM	POSITION 2 BYP	CWD SH.
1	1-2		X	*
	3-4	X		

MAINTAINED CONTACTS
KEY REMOVABLE IN
NORM POSITION ONLY

NOTE:
VALVE LIMIT SWITCHES SHOWN IN VALVE CLOSED POSITION

VALVE LIMIT SWITCH DEVELOPEMENT

VALVE OPENING %

0 100

ac
ac
bc
bo

CS-4

CS-4 (CLOSE, PUSH TO OPEN, CLOSE, OPEN)

CONTACTS	POSITION 9 close	POSITION 12 NORM	POSITION 3 open	CWD SH.
1-2	x	x		
3-4			x	*
5-6		x	x	*
7-8	x			

TYPE CMC SPRING RETURN TO NORMAL

CS-2

CS-2 (CLOSE, PUSH TO OPEN, CLOSE, OPEN)

CONTACTS		BLOCK	POSITION 9 close	POSITION 12 NORM	POSITION 3 open	CWD SH.
1-2	Free	2			x	*
	Depress					
5-6	Free	2		x	x	*
	Depress			x	x	
3-4	Free	1				*
	Depress			x		
7-8	Free	1		x	x	*
	Depress			x	x	

TYPE CMC SPRING RETURN TO NORMAL

LOCKED CLOSE OPEN

CS-1

CS-1(RTGB)

CONTACTS	POSITION 10 CLOSE LOCKED	POSITION 12 NORM	POSITION 2 OPEN	CWD SH.
1-2		x	x	*
3-4	x			
5-6	x	x		
7-8			x	*

TYPE PTK SPRING RETURN FROM OPEN TO NORM, MAINTAINED IN CLOSE KEY REMOVAL IN CLOSE POS ONLY

* THIS SHEET

Engineering Change Markup	EC#: 14767		Page 2 of 2
DOC#: B424		SHT#: E591	REV 5
Safety Related: ☒	Before View ☐	Control Room Drawing: ☒	
Prepared By:	03/19/10 Date	Reviewer Name (Optional)	

(G-167-2)

REV.	DATE	BY	APPROVAL
5	6-3-08	DD	JAG JAG
4	12-5-00	JAG	RJC N/A

EBASCO SERVICES INCORPORATED
DIV I & C DR DS
CH S. LIN
DATE JAN. 9, 1980
APPROVED

LOUISIANA POWER & LIGHT CO.
WATERFORD S.E.S. UNIT NO.3
CONTROL WIRING DIAGRAM
RCS LOOP 1 SHUTDOWN COOLING
ISOLATION VA 1SI-V1501B

B424
SHEET E591

FILENAME: IDEAS

AUX PNL 2
(AE) (X-1472, 1473, 1468)

LCP-43
(-9581)

4160V SWGR
3B3-S4
(-6452)

ADD
SH. 591
120 AC VITAL
SH 558

1D PX-4
1B T SH269
(AA)

ST-EREL-590

1A-T3

F-5B
L-5B
E-5B
G-5B

REFERENCE ELEMENTARY CWD
(Q-167-2)

480V, 3ϕ, 60HZ

SI-EBKR-311B-8D

SI-EMTR-311B-8D

SI-EOL-311B-8D-2

SI-EHTR-311B-8D-1

SI-EHTR-311B-8D-2

40W MAX MTR SPACE HEATER

25W MAX SPACE HEATER

(SI-666) MOTOR

120V

FU

CS-3
BYP

REACTOR AUX BLDG
480V MCC-3B311-S
COMPT 8D

SH. 592S

REVISE
VA LIMIT SW

AUX PNL-2
(AA) SH 269

TEE30590M2-NB
JB-1
X13641

TEE32838H-NB
140

M-XB M1-XB H1-XB H-XB J-XB ISOL PNL (X-3799)

ANN (CP-19)
BAY #6
NO107
PC1524

R-XB
N-XB

SH 592 (B)

LOCKED OPEN
CLOSE

CS-1

CONTACTS	POSITION 10 CLOSE	12 NORM	2 OPEN	CWD SH.
1-2		X	X	#
3-4	X			#
5-6	X	X		#
7-8			X	#

TYPE PTK # THIS SHEET
SPRING RETURN TO NORM FROM OPEN, MAINTAINED IN CLOSE, KEY REMOVABLE IN CLOSE POSITION ONLY.

RCS LOOP 1 SHDN CLG UPSTRM ISOL VA IN

CLOSE OPEN

RCS LOOP SHDN CLG UPSTRM ISOL VA IN

CS-2

CONTACTS	POSITION 9 CLOSE	12 NORM	3 OPEN	CWD SH.
1-2	X	X		#
3-4			X	#
5-6		X	X	#
7-8	X			#

TYPE GMC # THIS SHEET
SPRING RETURN TO NORM

NORM BYP

CS-3

BLOCK	CONTACTS	POSITION 10 NORM	2 BYP	CWD SH.
1	1-2		X	*
	3-4	X		

TYPE PTK • THIS SHEET
MAINTAINED CONTACTS
KEY REMOVABLE IN
NORM POSTITION ONLY

SI-I7S-0401B

LIMIT SW DEVELOPMENT

EBASCO SYM	CONT	VALVE OPEN % 0 100	CWD SH.
bo	1-2		*
ao	3-4		*
bo	5-6		*
ao	7-8		*
ao	9-10		*
bc	11-12		2#38
ao	13-14		2#38
bc	15-16		*
2%	17-18		
5%	19-20		*
4%	21-22		
3%	23-24		
6%	25-26		*
8%	27-28		
5%	29-30		
8%	31-32		
tc	35-36	OPENS ON CVLV ON CLOSE STRK	*
to	45-46	OPENS ON CVLV ON OPEN STRK	*

oo= CONT CLOSED * = THIS SHEET

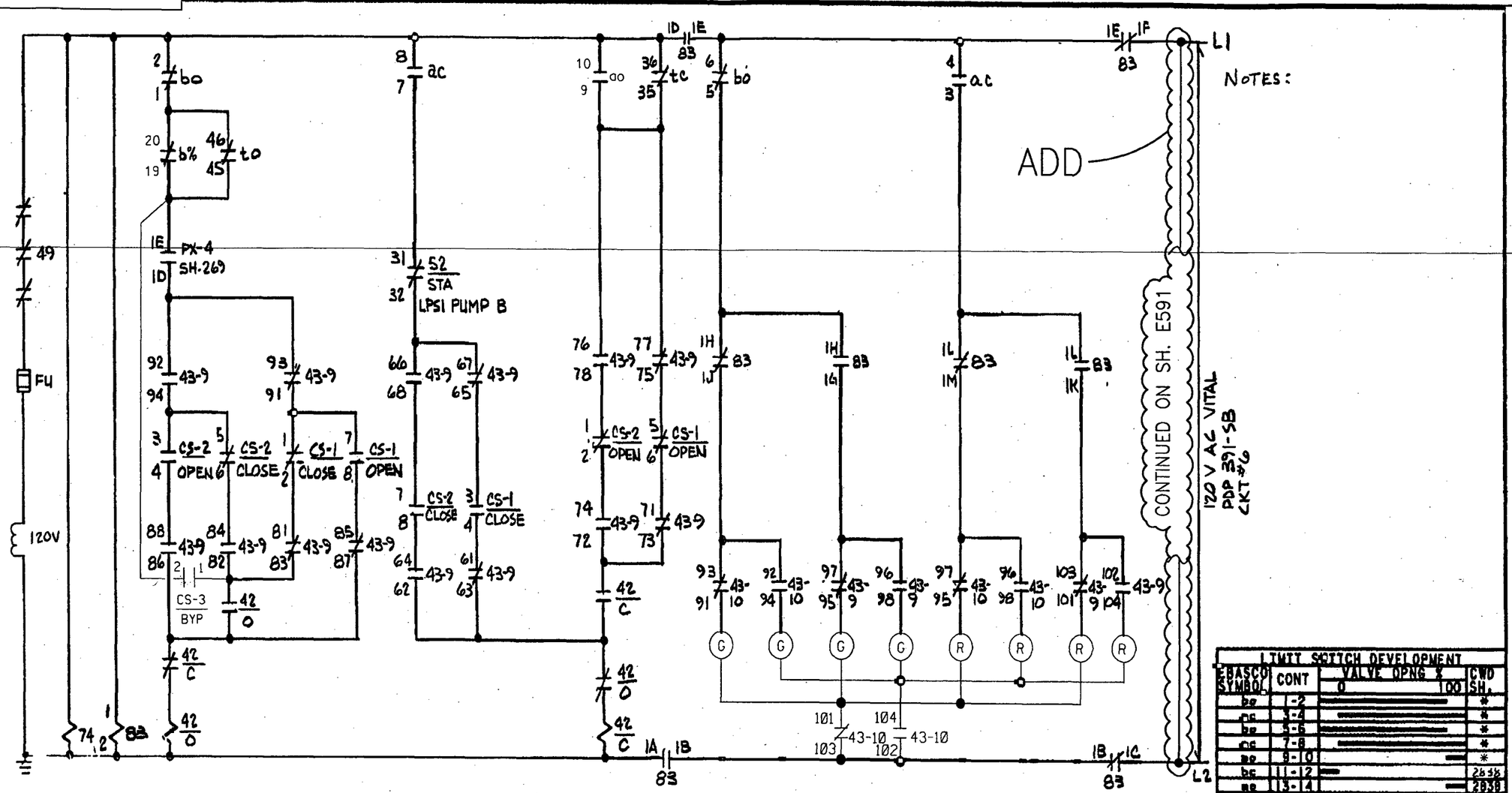
Engineering Change Markup	EC#: 14767	Page 2 of 2
DOC#: B424	SHT#: 590	REV 32
Safety Related: ☒	Before View ☐	Control Room Drawing: ☒
Prepared By:	10/03/09 Date	PC / P. S. Co. DAS Reviewer Name (Optional)

REV.	DATE	BY	APPROVAL
32	6-2-08	DD	JAG JAG
31	12-12-06	JAG	DDD N/A
30	12-5-00	JAG	RJC N/A
29	9-19-97	THS	RJC N/A
28	9-21-95	LLB	ML PJB
27	2-10-95	DDD	THS EF

EBASCO SERVICES INCORPORATED
NEW YORK
DIV. X & C DR. S.R.
SCALE NONE CH. J.T.
DATE SEPT 28, 1976

LOUISIANA POWER & LIGHT CO.
WATERFORD S.E.S. UNIT No.3
CONTROL WIRING DIAGRAM
RCS LOOP No.1 SHUTDOWN
COOLING ISOL VA 1SI-V1502

B424
SHEET 590



CS-3

BLOCK	CONTACTS	POSITION 10 NORM	POSITION 2 BYP	CWD SH
1	1-2		X	*
	3-4	X		

MAINTAINED CONTACTS
KEY REMOVABLE IN
NORM POSITION ONLY

CS-1 (RTGB)

CONTACTS	POSITION 10 CLOSE	12 NORM	2 OPEN	CWD SH.
1-2		X	X	*
3-4	X			*
5-6	X	X		*
7-8			X	*

SPRING RETURN TO NORMAL
FROM OPEN, MAINTAINED
IN CLOSE, KEY REMOVABLE
IN CLOSE POSITION ONLY

CS-2 (LOCAL)

CONTACTS	POSITION 9 CLOSE	12 NORM	3 OPEN	CWD SH.
1-2	X	X		*
3-4			X	*
5-6		X	X	*
7-8	X			*

SPRING RETURN TO NORMAL

LIMIT SWITCH DEVELOPMENT

EBASCO SYMBOL	CONT	VALVE OPNG % 0 — 100	CWD SH.
bo	1-2		*
co	3-4		*
bo	5-6		*
co	7-8		*
ao	9-10		*
bc	11-12		2838
ao	13-14		2838
bc	15-16		590
a%	17-18		*
b%	19-20		*
a%	21-22		
b%	23-24		
b%	25-26		590
a%	27-28		
b%	29-30		
a%	31-32		
to	35-36	OPENS ON OVERLOAD ON CLOSE STROKE	*
to	45-46	OPENS ON OVERLOAD ON OPEN STROKE	*

— CONT CLOSED

43-10, 43-9 TRANSFER SWITCH SH. 2942
* THIS SHEET

Engineering Change Markup	EC#: 14767	Page 2 of 2
DOC#: B424	SHT#: E590	REV 9
Safety Related ☒	Before View ☐	Control Room Drawing ☒
Prepared By:	02/16/10 Date	Reviewer Name (Optional)

(G-167-2)

This drawing was used in its entirety to scan and rasterize to produce this revision, REV 4.

REV	DATE	BY	APPROVED
9	12-12-06	JAG	DD N/A
8	12-5-00	JAG	RJC N/A
7	2-9-95	ⓓ	DDD EF
6	12-2-92	LB/ML	RJC N/A
5	10-3-91	ML/HU	LFP TMG
4	11/22/90	DLH	VI MM

EBASCO SERVICES INCORPORATED
DIV I & C DR DS
CH S. LIN
DATE JAN. 9, 1980
APPROVED

LOUISIANA POWER & LIGHT CO.
WATERFORD S.E.S. UNIT NO. 3
CONTROL WIRING DIAGRAM
RCS LOOP 1 SHUTDOWN
COOLING ISOLATION VA ISI-V1502B

B424
SHEET E590