ENCLOSURE 4
WATTS BAR NUCLEAR PLANT (WBN)
CALCULATION WBN-EEB-MS-TI15-0011
480V NON-CLASS 1E POWER CABLE ASSOCIATED CIRCUITS

QA Record

TVA 10697 (DNE-6-86) DNE CALCULATIONS PAGE 1D

TITLE	PLANT/UNIT
480V Non-Class 1E Power Cable Associated Circuits	WBN 1&2

ORIGINATING ORGANIZATION	KEY NOUNS (Consult RIMS DESCRIPTORS LIST)
NE, EE	Cable, Associated, Circuit Anal, Non-Safety Rel, Power

BRANCH/PROJECT IDENTIFIERS	Each time these calculations are issued, preparers must ensure that the original (RO) RIMS accession number is filled in.		
	Rev	(for RIMS' use)	RIMS accession number
WBN EEB-MS-TI15-0011	R0	900315E0015	B26900220409
APPLICABLE DESIGN DOCUMENT(S)	R 13	911030D0022 (36)	B26 '91 1002 401
WB-DC-30-4 R5 EEB TI-15 R0 FSAR 8.3.1.4.3	R 14	920117B0015 (31)	B26 '92 0102 400
SAR SECTION(S): 8.3 / UNID SYSTEM(S): NA	R 15	APR 28 1992 (438)	B18 '92 0427 253

Revision 0	R 13	R 14	R 15
ECN No. (or indicate Not Applicable) NA	DCN M-13390B	DCN M-15092-A	DCNs M-08614-A, M-12212-A
Prepared G.S. Bates *	RBarbaye	JTMorgb	Mac Roopam 04-25-92
Checked T.B. Thorsell*	JTMorgb	DJCbb	04-25-92
Reviewed T.B. Thorsell*	JTMorgb	DJC (2nd addition 12/30/91)	
Approved P. Schaffer/M.C. Brickey*	RBarbaye for PS / MCB	DJC for TBT C.C. Lyles for MCB	for MCB
Date	10-2-91	12/31/91	4/25/92
List all pages added by this revision.	See Rev. Log	SEE REV. LOG	See Rev Log
List all pages deleted by this revision.	↓	↓	↓
List all pages changed by this revision.	↓	↓	↓

Use form TVA 10534 if more space required.

Safety-related? Yes [X] No [ ]

Statement of Problem

FSAR Section 8.3 identifies acceptable protection of Non-1E circuits located in category 1 structures as two breakers in series, one breaker and one fuse in series, or one single fuse. In addition to meeting this protection requirement for reliability, it is necessary to identify the ratings of protective devices that will protect the class 1E circuits from thermal damage caused by associated non-1E circuits.

Abstract *For original signatures see RIMS No. B26900220409

These calculations contain an unverified assumption(s) that must be verified later. Yes [ ] No [X]

This calculation reviews all 480V non-1E power cables that have an end point in a category 1 building for proper protection to assure that associated class 1E circuits are protected against thermal damage. Included in this population of non-1E cables are appendix R 480V associated circuits. Sections 8.0 and 9.0 provide the summary of results and conclusions.

See rev. log for total pages and FSAR compliance.

ORIGINAL

[ ] Microfilm and store calculations in RIMS Service Center. Microfilm and destroy. [ ] EEB

[X] Microfilm and return calculations to: Calculation Control Center Address: QAC-IC-WBN

cc: RIMS, SL 26 C-K

TVA 10534 (DNE 6-86) **QA Record** DNE CALCULATIONS **ORIGINAL**

TITLE 480V NON-CLASS IE POWER CABLE ASSOCIATED CIRCUITS

PLANT/UNIT WBN 1&2

PREPARING ORGANIZATION NE, EE

KEY NOUNS (Consult RIMS DESCRIPTORS LIST) CABLE, ASSOCIATED, CIRCUIT ANAL, NON SAFETY REL, POWER

BRANCH/PROJECT IDENTIFIERS WBN EEB-MS-TI15-0011

Each time these calculations are issued, preparers must ensure that the original (RO) RIMS accession number is filled in.

Rev	(for RIMS' use)	RIMS accession number
R0	900315E0015	B26900220409
R10	910219D0005	B26 '91 0102 403
R11	910514B0005 (3/11)	B26 '91 0419 401
R12	910826E0001 (3/09)	B26 '91 0802 405

APPLICABLE DESIGN DOCUMENT(S)
WB-DC-30-4 R5
EEB TI-15 R0
FSAR 8.3.1.4.3

SAR SECTION(S) 8.3

UNID SYSTEM(S) NA TMB 4-16-91

Revision 0	R10	R11	R12
ECN No. (or indicate Not Applicable) NA TMB 4-16-91	NA TMB 4-16-91	NA TMB 4-16-91	See rev. log
Prepared G. S. BATES*	T.M. Barker 12-21-90	T.M. Barker 4-5-91 4-9-91 4-11-91	C.H. Peterson 8/1/91
Checked T. B. THORSELL*	C.H. Peterson 12/21/90	E. J. Gyorog 4/16/91	E. J. Gyorog 8/2/91
Reviewed T. B. THORSELL*	R.S. Hall GW	C.H. Peterson	D.M. Fields 8/2/91
Approved P. SCHAFFER/M.C. BRICKEY*	C.C. Lyke for MCB	M.C. Brickey	M.C. Brickey
Date	2-20-90	12/28/90	4-19-91	8-2-91

Use form TVA 10534 if more space required.

SEE REV LOG

- List all pages added by this revision.
- List all pages deleted by this revision.
- List all pages changed by this revision.

Safety-related? Yes ☒ No ☐

Statement of Problem

FSAR SECTION 8.3 IDENTIFIES ACCEPTABLE PROTECTION OF NON-IE CIRCUITS LOCATED IN CATEGORY I STRUCTURES AS TWO BREAKERS IN SERIES, ONE BREAKER AND ONE FUSE IN SERIES, OR ONE SINGLE FUSE.

IN ADDITION TO MEETING THIS PROTECTION REQUIREMENT FOR RELIABILITY, IT IS NECESSARY TO IDENTIFY THE RATINGS OF PROTECTIVE DEVICES THAT WILL PROTECT THE CLASS IE CIRCUITS FROM THERMAL DAMAGE CAUSED BY ASSOCIATED NON-IE CIRCUITS.

Abstract *FOR ORIGINAL SIGNATURES SEE RIMS NO. B26900220409

These calculations contain an unverified assumption(s) that must be verified later. ~~Yes ☒~~ No ☒

THIS CALCULATION REVIEWS ALL 480V NON-IE POWER CABLES THAT HAVE AN END POINT IN A CATEGORY I BUILDING FOR PROPER PROTECTION TO ASSURE THAT ASSOCIATED CLASS IE CIRCUITS ARE PROTECTED AGAINST THERMAL DAMAGE. INCLUDED IN THIS POPULATION OF NON-IE CABLES ARE APPENDIX R 480V ASSOCIATED CIRCUITS. Sections 8.0 and 9.0 provide the summary of results and conclusions.
SEE REV LOG FOR TOTAL PAGES AND FSAR COMPLIANCE.

1 OF 5

☐ Microfilm and store calculations in RIMS Service Center.

☒ Microfilm and return calculations to: ~~BECKY YOUNG~~ CALCULATION CONTROL CENTER

Microfilm and destroy. ☐ QAC-IC-WBN

Address: ~~T5OB, WBN~~

cc: RIMS, SL 26 C-K

QA Record

TITLE 480V NON-CLASS 1E POWER CABLE ASSOCIATED CIRCUITS

PLANT/UNIT WBN 1&2

PREPARING ORGANIZATION NE, EE

KEY NOUNS (Consult RIMS DESCRIPTORS LIST)

BRANCH/PROJECT IDENTIFIERS

WBN EEB-MS-TI15-0011

Each time these calculations are issued, preparers must ensure that the original (RO) RIMS accession number is filled in.

Rev	(for RIMS' use)	RIMS accession number
R0	900315E0015	B26900220409
R 7	900912A0020	B26 '90 0828 405
R 8	901027E0007	B26 '90 1005 417
R 9	910104E0034	B18 901216 502

APPLICABLE DESIGN DOCUMENT(S)
WB-DC-30-4 R5
EEB TI-15 R0
FSAR 8.3.1.4.3

SAR SECTION(S): 8.3

UNID SYSTEM(S):

Revision 0	R 7	R 8	R 9
ECN No. (or indicate Not Applicable)	DCN M-10541-B	DCN F-13654-A	DCN's M-09494-A C-03205-A
Prepared G. S. BATES*	8-25-90 T. M. Barker	10-5-90 T M Barker	12-11-90 T. M. Barker
Checked T. B. THORSELL*	8-27-90 T. B. Thorsell	10-5-90 for S24	GCP 12-14-90
Reviewed T. B. THORSELL*	8-27-90	10/5/90	12-14-90
Approved * P. SCHAFFER/M. C. BRICKEY	C.C. Lyke for MCB	C.C. Lyke for MCB	
Date 2-20-90	8/27/90	10/5/90	12-14-90

Use form T 10534 if more space required.

SEE REV LOG

- List all pages added by this revision.
- List all pages deleted by this revision.
- List all pages changed by this revision.

Safety-related? Yes ☒ No ☐

Statement of Problem

FSAR SECTION 8.3 IDENTIFIES ACCEPTABLE PROTECTION OF NON-1E CIRCUITS LOCATED IN CATEGORY I STRUCTURES AS TWO BREAKERS IN SERIES, ONE BREAKER AND ONE FUSE IN SERIES, OR ONE SINGLE FUSE.

IN ADDITION TO MEETING THIS PROTECTION REQUIREMENT FOR RELIABILITY, IT IS NECESSARY TO IDENTIFY THE RATINGS OF PROTECTIVE DEVICES THAT WILL PROTECT THE CLASS 1E CIRCUITS FROM THERMAL DAMAGE CAUSED BY ASSOCIATED NON-1E CIRCUITS.

Abstract *FOR ORIGINAL SIGNATURES SEE RIMS NO. B26900220409

These calculations contain an unverified assumption(s) that must be verified later. Yes ☒ No ☐

THIS CALCULATION REVIEWS ALL 480V NON-1E POWER CABLES THAT HAVE AN END POINT IN A CATEGORY I BUILDING FOR PROPER PROTECTION TO ASSURE THAT ASSOCIATED CLASS 1E CIRCUITS ARE PROTECTED AGAINST THERMAL DAMAGE. INCLUDED IN THIS POPULATION OF NON-1E CABLES ARE APPENDIX R 480V ASSOCIATED CIRCUITS.

SEE REV LOG FOR TOTAL PAGES AND FSAR COMPLIANCE.

☐ Microfilm and store calculations in RIMS Service Center. Calculation Control Center

☐ Microfilm and destroy.

☒ Microfilm and return calculations to: ~~BECKY YOUNG~~

Address: ~~T5OB, WBN~~ QAC-1C-WBN

cc: RIMS, SL 26 C-K

TVA 10697 (DNE-6-86) **QA Record** DNE CALCULATIONS ORIGINAL PAGE 1A

TITLE	PLANT/UNIT
480V NON-CLASS 1E POWER CABLE ASSOCIATED CIRCUITS	WBNP 1 & 2

PREPARING ORGANIZATION: NE, EE

KEY NOUNS (Consult RIMS DESCRIPTORS LIST)

BRANCH/PROJECT IDENTIFIERS: WBN EEB-MS-TI15-0011

Each time these calculations are issued, preparers must ensure that the original (RO) RIMS accession number is filled in.

Rev	(for RIMS' use)	RIMS accession number
R0	900315E0015	B26900220409
R4	900706D0008	B26 '90 0615 413
R5	900710D0008	B26 '90 0618 413
R6	900730A0005	B26 '90 0706 404

APPLICABLE DESIGN DOCUMENT(S): WB-DC-30-4 R5; EEB TI-15 R0; FSAR 8.3.1.4.3

SAR SECTION(S): 8.3 | UNID SYSTEM(S):

Revision 0	R4	R5	R6
ECN No. (or indicate Not Applicable) EJJ 6/6/90	DCNs M10448A M08613A	DCN M08613A	DCN K-03129-A
Prepared G.S. BATES *	T.M. Barker 6-13-90	E.J. Jahera 6/18/90	E.J. Jahera 7/6/90
Checked T.B. THORSELL *	E.J. Jahera 6/18/90	Christenson 6/18/90	Christenson 7/6/90
Reviewed T.B. THORSELL *	E.J. Jahera 6/18/90	Christenson 6/18/90	7/6/90
Approved P.J. SCHAFFER * M.C. BRICKEY *	M.C. Brickey	M.C. Brickey	C.C. Lyke for MCB
Date 2-20-90	6-15-90	6-18-90	7/6/90
List all pages added by this revision.	SEE REV. LOG	SEE REV. LOG	SEE REV. LOG
List all pages deleted by this revision.	SEE REV. LOG	SEE REV. LOG	SEE REV. LOG
List all pages changed by this revision.	SEE REV. LOG	SEE REV. LOG	SEE REV. LOG

Use form TVA 10534 if more space required.

Safety-related? Yes ☒ No ☐

Statement of Problem

FSAR SECTION 8.3 IDENTIFIES ACCEPTABLE PROTECTION OF NON-1E CIRCUITS LOCATED IN CATEGORY I STRUCTURES AS TWO BREAKER IN SERIES, ONE BREAKER AND ONE FUSE IN SERIES, OR ONE SINGLE FUSE.

IN ADDITION TO MEETING THIS PROTECTION REQUIREMENT FOR RELIABILITY, IT IS NECESSARY TO IDENTIFY THE RATINGS OF PROTECTIVE DEVICES THAT WILL PROTECT THE CLASS 1E CIRCUITS FROM THERMAL DAMAGE CAUSED BY ASSOCIATED NON-1E CIRCUITS.

ORIGINAL

Abstract

These calculations contain an unverified assumption(s) that must be verified later. Yes ☒ No ☐

THIS CALCULATION REVIEWS ALL 480V NON-1E POWER CABLES THAT HAVE AN END POINT IN A CATEGORY I BUILDING FOR PROPER PROTECTION TO ASSURE THAT ASSOCIATED CLASS 1E CIRCUITS ARE PROTECTED AGAINST THERMAL DAMAGE. INCLUDED IN THIS POPULATION OF NON-1E CABLES ARE APPENDIX R 480V ASSOCIATED CIRCUITS.

R4 | FSAR COMPLIANCE REVIEW M.C. Brickey (ABC/LE) DATE 6-15-90

R5 | FSAR COMPLIANCE REVIEW M.C. Brickey DATE 6-18-90

* FOR ORIGINAL SIGNATURES, SEE RIMS NO. B26900220409.

☐ Microfilm and store calculations in RIMS Service Center. Microfilm and destroy. ☐

☒ Microfilm and return calculations to: BECKY YOUNG Address: T20B, WBN

cc: RIMS, SL 26 C-K

TVA 10697 (DNE-6-86) **QA Record** ORIGINAL DNE CALCULATIONS Page 1 of ~~200~~ 204 WLB 2/15/90

TITLE	PLANT/UNIT
480 V Non-Class 1E Power Cable Associated Circuits	WBNP 1&2

PREPARING ORGANIZATION	KEY NOUNS (Consult RIMS DESCRIPTORS LIST)
NE, EE	CABLE, ASSOCIATED, CIRCUIT ANAL, NON SAFETY REL, POWER

BRANCH/PROJECT IDENTIFIERS: WBN EEB-MS-TI15-0011

Each time these calculations are issued, preparers must ensure that the original (RO) RIMS accession number is filled in.

Rev	(for RIMS' use)	RIMS accession number
R0	900315E0015	B26 '90 0220 409
R1	900524D0005	B26 '90 0413 410
R2	900716B0001	B26 '90 0427 405
R3	900730A0001	B26 '90 0511 409

APPLICABLE DESIGN DOCUMENT(S): WB-DC-30-4 R5; EEB TI-15 R0; FSAR 3.3.1.4.3

SAR SECTION(S): 8.3 | UNID SYSTEM(S):

Safety-related? Yes ☒ No ☐

	Revision 0	R1	R2	R3
ECN No. (or indicate Not Applicable)	N/A			DCN P-5297-A
Prepared	D S Bates	4-12-90 T. M. Barker	4-27-90 T. M. Barker	5-3-90 T. M. Barker
Checked	TB Thornell	4/12/90 WSH	4-27-90	5/7/90
Reviewed	TB Thornell	4/12/90 WSH	4-27-90 TMB	5/7/90 afal
Approved	afal 2/15/90	C.C. Lyke for MCB		DMG C.C. Lyke for MCB
Date	2-20-90	4/13/90	4-27-90	5/10/90
List all pages added by this revision.	See TVA			
List all pages deleted by this revision.	Form 10534			
List all pages changed by this revision.	Rev. Log			

Use form TVA 10534 if more space required.

Statement of Problem

FSAR Section 8.3 identifies acceptable protection of non-1E circuits located in Category I structures as two breakers in series, one breaker and one fuse in series, or one single fuse.

In addition to meeting this protection requirement for reliability, it is necessary to identify the ratings of protective devices that will protect the Class 1E circuits from thermal damage caused by associated non-1E circuits.

Abstract

These calculations contain an unverified assumption(s) that must be verified later. Yes ☒ No ☐

This calculation reviews all 480 V non-1E power cables that have an end point in a Category I building for proper protection to assure that associated Class 1E circuits are protected against thermal damage. Included in this population of non-1E cables are Appendix R 480 V associated circuits.

R0: FSAR Compliance Review M C Barker Date 2-20-90

R1: FSAR COMPLIANCE REVIEW C.C. Lyke for MCB DATE 4/13/90

R2: FSAR COMPLIANCE REVIEW M C Barker DATE 4-27-90

R3: FSAR COMPLIANCE REVIEW C. C. Lyke for MCB DATE 5/10/90

SEE REV LOG FOR TOTAL PAGES

~~THIS CALCULATION CONTAINS 205 PAGES INCLUDING PAGES 163A, 163B, 181A AND 181B, 3A, ATTACHMENT MO8663A (SH. 1 & 6), pt. 3B~~ R1 R2

☐ Microfilm and store calculations in RIMS Service Center. Microfilm and destroy. ☐

☒ Microfilm and return calculations to: Becky Young Address: 113-TSOB-WBN

cc: RIMS, SL 26 C-K

RI: COMPUTED [illegible] DATE 7-11-90 COMPUTED TMB DATE 4-27-90
CHECKED [illegible] DATE 4/11/90 CHECKED TAD DATE 4-27-90

TVA

WBN EEB-MS-TI15-0011

Title: 480 V Non Class 1E Power Cable Associated Circuits

REVISION LOG

Revision No.	DESCRIPTION OF REVISION	Date Approved
0	Initial Issue	
1	REVISED PAGE 5 & 1, & PAGE 4 ADDED PAGE 3A AND ATTACHMENT M08663A (SH. 1→6)	
2	ADD UNVERIFIED ASSUMPTION (p. 8); ADDED PAGE 3B; REVISED p. 1, 2, & 5	
3	ADD PAGE 3C & ATTACHMENT P5297A (SH 1→3); REVISE PAGES 1, 2, 4, & 5 TOTAL PAGES REV. 3 = 8. FOR COMPLETE CALCULATION ADD REV. 1, 2, & 3 TO REV. 0	TMB 5-3-90 GP 5/7/90
4	~~ADDED ATTACHMENT NOS. M08613A, PAGES 1-7 AND~~ EJJ 6/13/90 M10448A, PAGES 1-7. ADDED PAGES 1A AND 3D. REVISED PAGES 5 & 2 TOTAL PAGES ~~FOR~~ REVISION 4: ~~18~~ 13 PAGES. FOR COMPLETE CALCULATION COMBINE REVISIONS 0, 1, 2, 3, AND 4. ~~90~~	TMB 6-13-90 EJJ 6/13/90
5	ADDED ATTACHMENT NO. M08613A, PAGES 1-8 AND PAGE 3E REVISED PAGES 1A, 2, 4, AND 5. TOTAL PAGES FOR REVISION 5: 14 FOR COMPLETE CALCULATION COMBINE REVISION 0, 1, 2, 3, 4 AND 5.	EJJ GP 6/18/90
6	ISSUED CALC. TO SUPPORT DCN K-03123-A WHICH DELETES PAX MULTIPLEXER XFMR 0-DXF-253-1 FROM 480V AUX BLDG COM MCC B, COMPT 5F1. THE DELETION IS CONSERVATIVE AND WILL BE INCORPORATED IN THE NEXT ATTACHMENT TO THE CALCULATION. REVISED PAGES 1A AND 2. TOTAL PAGES FOR REVISION 6: ~~2~~ 3 GP 7/6/90. FOR COMPLETE RE CALCULATION COMBINE REVISIONS 0, 1, 2, 3, 4, 5 AND 6. ADDED PAGE 3F	EJJ 6/6/90 GP 7/6/90
7	O-MTR-31-203/204 (C&A BLDG VENT BD 1A2-A, COMPT 4B) DELETED PER DCN M-10541-B. THIS DELETION IS CONSERVATIVE AND WILL BE DELETED FOR THE CALCULATION ON A LATER REVISION. REVISED: PAGE 2 TOTAL PAGES REV. 7: 2 ADDED: PAGE 1B, FOR COMPLETE CALCULATION COMBINE REV. 0→7	TMB 8-25-90 TAD 8-27-90
8	ADD: ATTACHMENT F13654A FOR DCN F-13654-A PAGE 3G REVISED: PAGE 1B, 2, 4, 5 FSAR COMPLIANCE REVIEW C.C. Lyle for MCB DATE 10/5/90 TOTAL PAGES REV. 8: 18 FOR COMPLETE CALCULATION COMBINE REV 0→8	

TVA

WBN EEB-MS-TI15-0011

Title: 480V NON-CLASS 1E POWER CABLE ASSOCIATED CIRCUITS

REVISION LOG

Revision No.	DESCRIPTION OF REVISION	Date Approved
9	ADDED: ~~ATTACHMENT C03205A (FOR DCN C-03205-A)~~ TMB 12-13-90 PAGE: 2A, 3H ATTACHMENT NO. C03205A/M09494A (FOR DCN C-03205-A & M-09494A) REVISED: PAGE 1B, 4, 5 TOTAL PAGES REV. 9: ~~14~~ 16 TMB 12-13-90 FOR COMPLETE CALCULATION COMBINE REV Ø THRU 9 FSAR COMPLIANCE REVIEW MC Burks DATE 12-14-90	
10	ADDED: ATTACHMENT NO. UVA2.1/2.4 TO RESOLVE UNVERIFIED ASSUMPTIONS 2.1 AND 2.4 PAGE 3I, 1C REVISED: PAGE 2A, 4, 5, 8, 13, 14 (REMOVED UNVERIFIED ASSUMPTION 2.6) THIS IS A COMPLETE CALCULATION TOTAL PAGES REV. 10: 344 INCLUDING PAGES 1A, 1B, 1C, 2A, 3A, 3B, 3C, 3D, 3E, 3F, 3G, 3H, 3I, 163A, 163B, 181A, 181B, AND ATTACHMENTS ADDED ON R1 THRU R10. FSAR COMPLIANCE REVIEW C.C. Lyle for MCB DATE 12/28/90	CP 12/20/90
11	REVISED CALCULATION TO RESOLVE ENGINEERING SELF-ASSESMENT COMMENTS 2, 3, 4, 5, 6, 7, ~~8~~, 9, 11, AND 12 (ACTION ITEM NO. WBNA-08, REV. Ø). TMB 4-15-91 REVISED: PAGES 1C, 2A, 4, 5, and ~~8~~, 12, 15 TMB 4-17-91 PAGES 1 of 24 and 4 of 24 (ATTACHMENT 1) PAGES A1, A2, A3, A4, and A5 of APPENDIX A PAGES C1, C5 thru C20, and C23 thru C27 of APPENDIX C MINOR ADMINISTRATIVE CORRECTION WAS MADE TO DELETE THE TOTAL CALCULATION PAGE COUNT WHICH WAS SHOWN ON SEVERAL PAGES. ADDED: PAGE 3J PAGES 80 thru 93 of ATTACHMENT UVA2.1/2.4 DELETED: PAGES B0 thru B17 of APPENDIX B TOTAL PAGES REV. 11: 341 INCLUDING PAGES 1A, 1B, 1C, 2A, 3A, 3B, 3C, 3D, 3E, 3F, 3G, 3H, 3I, 3J, 163A, 163B, 181A, 181B, AND ALL ATTACHMENTS ADDED ON SUBSEQUENT REVISIONS FSAR COMPLIANCE MC Burks DATE 4-19-91	TMB 3-8-91 EJJ 4/16/91 EJJ 4/18/91

TVA

Title: 480V Non-Class 1E Power Cable Associated Circuits

REVISION LOG

WBN EEB-MS-TI15-0011

Revision No.	DESCRIPTION OF REVISION	Date Approved
12	Added Attachments ECN 6670, P00972B, P03437A. Added page 2B, 3K; revised page 1C, 4. Total pages R12 = 360. No FSAR sections are deemed relevant to this revision. R12 FSAR Compliance _____ ASSC/LE / 8-2-91 Date	See cover sheet for approval and date.
13	Revised calculation to support DCN M-13300-B which reclassifies voltage level from V3 to V4 for cable PL3390. Added attachment M13300B. Added page : 1D, 3L, and attachment M13300B (4 pages) Revised pages: 2B, 4 & 5 **Total number of pages for Revision 13 = 366** No FSAR sections are impacted by this revision. FSAR Compliance: _____ Date: 10-2-91	SEE COVER SHEET FOR APPROVAL AND DATE.
14	Revised Calculation to support DCN M-15092-A which change the size of cable 1PL3017 from a #10 to a #6. Added Attachment M15092A (4 pgs) and Page 3M, revised pgs 1D, 2B, 4 & 5. Total Number of Pages R14 = 371 No FSAR Sections are impacted by this Revision. FSAR Compliance C.C. Lyle for MCB Date 12/31/91	See cover sheet for approval and date

TITLE: 480V NON-CLASS 1E POWER CABLE ASSOCIATED CIRCUITS	REVISION LOG WBN EEB-MS-TI15-0011

REVISION NUMBER	DESCRIPTION OF REVISION	DATE APPROVED
15	ADDED ATTACHMENT M08614A TO SUPPORT DCNs M-08614-A& THIS ATTACHMENT REEVALUATES AND REVISES APPENDIX F, G AND H OF THIS CALCULATION BASED UPON THE LATEST CONFIGURATION CONTROL DRAWINGS, THE CCRS, CALCULATION WBN EEB-MS-TI08-0008 ATTACHMENT M12212A, AND ATTACHMENT M08613A OF THIS BASELINE CALCULATION. FOR BASELINE: PAGES REVISED: 1D, 4 PAGES DELETED: NONE PAGES ADDED: 2C, 3N FOR ATTACHMENT: PAGES REVISED: NONE PAGES DELETED: NONE PAGES ADDED: 1 THRU. 9, APP. 1 (5 PAGES) APP. 2 (1 PAGE) APP. 3 (46 PAGES) APP. 4 (2 PAGES) APP. 5 (2 PAGES) TOTAL PAGES INCLUDING REV 15 = 438 FSAR SECTION 8.3.1.4.3 WAS REVIEWED. NO DISCREPANCIES EXIST BETWEEN THIS REVISION AND THE FSAR. M.R. 4/24/92 FSAR COMPLIANCE REVIEW Don Hallum for MCB DATE 4/25/92 ABC/LDE PREPARED BY Mac Roopani DATE 4/24/92 CHECKED BY Joe Tarpley DATE 04-24-92	M-12212-A. SEE COVER SHEET FOR APPROVAL & DATE

THIS SHEET ADDED BY REVISION 15

CALCULATION DESIGN VERIFICATION (INDEPENDENT REVIEW) FORM

WBN EEB-MS-TI15-0011	0
Calculation No.	Revision

Method of design verification (independent review) used (check method used):

1. Design Review ____X____
2. Alternate Calculation _____
3. Qualification Test _____

Justification (explain below):

Method 1: In the design review method, justify the technical adequacy of the calculation and explain how the adequacy was verified (calculation is similar to another, based on accepted handbook methods, appropriate sensitivity studies included for confidence, etc.).

Method 2: In the alternate calculation method, identify the pages where the alternate calculation has been included in the calculation package and explain why this method is adequate.

Method 3: In the qualification test method, identify the QA documented source(s) where testing adequately demonstrates the adequacy of this calculation and explain.

Independently reviewed Calculation WBN EEB-MS-TI15-0011, R0 for technical adequacy as addressed in 10CFR50, Appendix B (NEP 3.1 Attachment 10). The design input data and assumptions were reviewed and found appropriate and reasonable. The calculation methods were based on Branch Technical Instruction ~~EEB-TI08~~ EEB-TI15, Rev.0. The results and conclusions are adequate.

TBT 2-5-90

T B Thornell — Design Verifier (Independent Reviewer)

2-5-90 — Date

JUN 21 1988

CALCULATION DESIGN VERIFICATION (INDEPENDENT REVIEW) FORM

WBN-EEB-MS-TI15-0011 — Calculation No.

1 — Revision

Method of design verification (independent review) used (check method used):

1. Design Review ✓
2. Alternate Calculation
3. Qualification Test

Justification (explain below):

Method 1: In the design review method, justify the technical adequacy of the calculation and explain how the adequacy was verified (calculation is similar to another, based on accepted handbook methods, appropriate sensitivity studies included for confidence, etc.).

Method 2: In the alternate calculation method, identify the pages where the alternate calculation has been included in the calculation package and explain why this method is adequate.

Method 3: In the qualification test method, identify the QA documented source(s) where testing adequately demonstrates the adequacy of this calculation and explain.

Reviewed R1 for technical adequacy as addressed in NEP 3.1 Attachment 10. R1 updates the protective settings of Group 1 loads. These settings were determined and documented in WBN-EEB-MS-TI08-0008 R1. The results/conclusions are adequate.

William S. Holbert — Design Verifier (Independent Reviewer)

4/11/90 — Date

CALCULATION DESIGN VERIFICATION (INDEPENDENT REVIEW) FORM

WBN EEB-MS-TI15-0011 — Calculation No.

2 — Revision

Method of design verification (independent review) used (check method used):

1. Design Review ✓
2. Alternate Calculation
3. Qualification Test

Justification (explain below):

Method 1: In the design review method, justify the technical adequacy of the calculation and explain how the adequacy was verified (calculation is similar to another, based on accepted handbook methods, appropriate sensitivity studies included for confidence, etc.).

Method 2: In the alternate calculation method, identify the pages where the alternate calculation has been included in the calculation package and explain why this method is adequate.

Method 3: In the qualification test method, identify the QA documented source(s) where testing adequately demonstrates the adequacy of this calculation and explain.

Reviewed R2 for technical adequacy as addressed in NEP 3.1 Attachment 10. R2 ~~updated~~ 9-27-90 ~~the protective~~ added an unverified assumption. The results and conclusions are unchanged

Thomas A Lemm — Design Verifier (Independent Reviewer)

9-27-90 — Date

NEP-3.1
Attachment 6
~~Page 1 of 1~~

CALCULATION DESIGN VERIFICATION (INDEPENDENT REVIEW) FORM

WBN EEB-MS-TI15-0011 — Calculation No.

3 — Revision

Method of design verification (independent review) used (check method used):

1. Design Review ✓
2. Alternate Calculation
3. Qualification Test

Justification (explain below):

Method 1: In the design review method, justify the technical adequacy of the calculation and explain how the adequacy was verified (calculation is similar to another, based on accepted handbook methods, appropriate sensitivity studies included for confidence, etc.).

Method 2: In the alternate calculation method, identify the pages where the alternate calculation has been included in the calculation package and explain why this method is adequate.

Method 3: In the qualification test method, identify the QA documented source(s) where testing adequately demonstrates the adequacy of this calculation and explain.

Independently reviewed for technical adequacy in accordance with NEP 3.1, Attachment 10. Inputs and outputs are appropriate and reasonable. Reviewed purpose, assumptions, methodology and conclusions to verify technical adequacy.

S K Sutton — Design Verifier (Independent Reviewer)

5/7/90 — Date

CALCULATION DESIGN VERIFICATION (INDEPENDENT REVIEW) FORM

WBN EEB-MS-TI15-0011 — Calculation No.

R4 — Revision

Method of design verification (independent review) used (check method used):

1. Design Review ✓
2. Alternate Calculation
3. Qualification Test

Justification (explain below):

Method 1: In the design review method, justify the technical adequacy of the calculation and explain how the adequacy was verified (calculation is similar to another, based on accepted handbook methods, appropriate sensitivity studies included for confidence, etc.).

Method 2: In the alternate calculation method, identify the pages where the alternate calculation has been included in the calculation package and explain why this method is adequate.

Method 3: In the qualification test method, identify the QA documented source(s) where testing adequately demonstrates the adequacy of this calculation and explain.

Independently reviewed calculation WBN EEB-MS-TI15-0011 in accordance with NEP-3.1 for technical adequacy.

Verified that the design inputs and outputs are reasonable and consistent based on experience and engineering judgement. Reviewed the purpose, assumptions, methodology and conclusions to verify adequacy of the calculation.

E. I. Iskaras — Design Verifier (Independent Reviewer)

6/13/90 — Date

CALCULATION DESIGN VERIFICATION (INDEPENDENT REVIEW) FORM

WBN EEB-MS-TI15-0011 — Calculation No.

R5 — Revision

Method of design verification (independent review) used (check method used):

1. Design Review ✓
2. Alternate Calculation
3. Qualification Test

Justification (explain below):

Method 1: In the design review method, justify the technical adequacy of the calculation and explain how the adequacy was verified (calculation is similar to another, based on accepted handbook methods, appropriate sensitivity studies included for confidence, etc.).

Method 2: In the alternate calculation method, identify the pages where the alternate calculation has been included in the calculation package and explain why this method is adequate.

Method 3: In the qualification test method, identify the QA documented source(s) where testing adequately demonstrates the adequacy of this calculation and explain.

Reviewed to verify technical adequacy. Inputs and outputs are appropriate and reasonable. Reviewed purpose, assumptions, methodology and conclusions to verify adequacy.

S/ [illegible] — Design Verifier (Independent Reviewer)

6/18/90 — Date

CALCULATION DESIGN VERIFICATION (INDEPENDENT REVIEW) FORM

WBNEEBMSTI150011
Calculation No.

R6
Revision

Method of design verification (independent review) used (check method used):

1. Design Review
2. Alternate Calculation ✓
3. Qualification Test

Justification (explain below):

Method 1: In the design review method, justify the technical adequacy of the calculation and explain how the adequacy was verified (calculation is similar to another, based on accepted handbook methods, appropriate sensitivity studies included for confidence, etc.).

Method 2: In the alternate calculation method, identify the pages where the alternate calculation has been included in the calculation package and explain why this method is adequate.

Method 3: In the qualification test method, identify the QA documented source(s) where testing adequately demonstrates the adequacy of this calculation and explain.

Reviewed to verify that this revision is conservative in nature and appropriate.

[signature]
Design Verifier
(Independent Reviewer)

7/6/90
Date

NEP-3.1
Attachment 6
Page 1 of 1

CALCULATION DESIGN VERIFICATION (INDEPENDENT REVIEW) FORM

WBNEEB-MS-TI15-0011 — Calculation No.
8 — Revision

Method of design verification (independent review) used (check method used):

1. Design Review ✓
2. Alternate Calculation
3. Qualification Test

Justification (explain below):

Method 1: In the design review method, justify the technical adequacy of the calculation and explain how the adequacy was verified (calculation is similar to another, based on accepted handbook methods, appropriate sensitivity studies included for confidence, etc.).

Method 2: In the alternate calculation method, identify the pages where the alternate calculation has been included in the calculation package and explain why this method is adequate.

Method 3: In the qualification test method, identify the QA documented source(s) where testing adequately demonstrates the adequacy of this calculation and explain.

Reviewed R8 for technical adequacy as addressed in NEP 3.1 Attachment 10. The design inputs are from calc WBN-EEB-MS-TI08-0008 R10. The results and conclusions are reasonable.

William T. Holbert — Design Verifier (Independent Reviewer)
10/5/90 — Date

CALCULATION DESIGN VERIFICATION (INDEPENDENT REVIEW) FORM

WBN EEB-MS-TI15-0011 — Calculation No.

9 — Revision

Method of design verification (independent review) used (check method used):

1. Design Review ✓
2. Alternate Calculation
3. Qualification Test

Justification (explain below):

Method 1: In the design review method, justify the technical adequacy of the calculation and explain how the adequacy was verified (calculation is similar to another, based on accepted handbook methods, appropriate sensitivity studies included for confidence, etc.).

Method 2: In the alternate calculation method, identify the pages where the alternate calculation has been included in the calculation package and explain why this method is adequate.

Method 3: In the qualification test method, identify the QA documented source(s) where testing adequately demonstrates the adequacy of this calculation and explain.

Reviewed R9 for technical adequacy per NEP 3.1 Attachment 10. The design input data, results and conclusion found to be reasonable and adequate.

GCPatel
Design Verifier
(Independent Reviewer)

12-14-90
Date

CALCULATION DESIGN VERIFICATION (INDEPENDENT REVIEW) FORM

WBN EEB-MS-TI15-0011 — Calculation No.

10 — Revision

Method of design verification (independent review) used (check method used):

1. Design Review ✓
2. Alternate Calculation
3. Qualification Test

Justification (explain below):

Method 1: In the design review method, justify the technical adequacy of the calculation and explain how the adequacy was verified (calculation is similar to another, based on accepted handbook methods, appropriate sensitivity studies included for confidence, etc.).

Method 2: In the alternate calculation method, identify the pages where the alternate calculation has been included in the calculation package and explain why this method is adequate.

Method 3: In the qualification test method, identify the QA documented source(s) where testing adequately demonstrates the adequacy of this calculation and explain.

Reviewed for technical adequacy in accordance with NEP 3.1. Verified design inputs and methodology were appropriate and the results and conclusion were reasonable based on experience and engineering judgement.

Design Verifier (Independent Reviewer) — 12/20/90 Date

CALCULATION DESIGN VERIFICATION (INDEPENDENT REVIEW) FORM

WBN EEB-MS-TI15-0011	11
Calculation No.	Revision

Method of design verification (independent review) used (check method used):

1. Design Review	✓
2. Alternate Calculation	
3. Qualification Test	

Justification (explain below):

Method 1: In the design review method, justify the technical adequacy of the calculation and explain how the adequacy was verified (calculation is similar to another, based on accepted handbook methods, appropriate sensitivity studies included for confidence, etc.).

Method 2: In the alternate calculation method, identify the pages where the alternate calculation has been included in the calculation package and explain why this method is adequate.

Method 3: In the qualification test method, identify the QA documented source(s) where testing adequately demonstrates the adequacy of this calculation and explain.

Independently reviewed revision 11 of calculation WBN EEB-MS-TI15-0011 in accordance with NEP 3.1 for technical adequacy.

Inputs and Outputs were reviewed and were found appropriate and reasonable. The purpose, assumptions, methodology and conclusions are adequate.

E. J. Salvas — Design Verifier (Independent Reviewer)

4/16/91 — Date

CALCULATION DESIGN VERIFICATION (INDEPENDENT REVIEW) FORM

WBN EEB-MS-TI15-0011 — Calculation No.

R12 — Revision

Method of design verification (independent review) used (check method used):

1. Design Review ✓
2. Alternate Calculation
3. Qualification Test

Justification (explain below):

Method 1: In the design review method, justify the technical adequacy of the calculation and explain how the adequacy was verified (calculation is similar to another, based on accepted handbook methods, appropriate sensitivity studies included for confidence, etc.).

Method 2: In the alternate calculation method, identify the pages where the alternate calculation has been included in the calculation package and explain why this method is adequate.

Method 3: In the qualification test method, identify the QA documented source(s) where testing adequately demonstrates the adequacy of this calculation and explain.

Independently reviewed revision 11 of calculation WBN EEB-MS-TI15-0011 for technical adequacy as addressed in NEP 3.1, ATTACHMENT 10. Reviewed that the design inputs are appropriate and reasonable. Verified that the purpose, assumptions, methodology, results, and conclusions are technically adequate.

E. I. Ighavas — Design Verifier (Independent Reviewer)

8/2/91 — Date

CALCULATION DESIGN VERIFICATION (INDEPENDENT REVIEW) FORM

WBN EEB-MS-TI15-0011 — Calculation No.
13 — Revision

Method of design verification (independent review) used (check method used):

1. Design Review ✓
2. Alternate Calculation
3. Qualification Test

Justification (explain below):

Method 1: In the design review method, justify the technical adequacy of the calculation and explain how the adequacy was verified (calculation is similar to another, based on accepted handbook methods, appropriate sensitivity studies included for confidence, etc.).

Method 2: In the alternate calculation method, identify the pages where the alternate calculation has been included in the calculation package and explain why this method is adequate.

Method 3: In the qualification test method, identify the QA documented source(s) where testing adequately demonstrates the adequacy of this calculation and explain.

INDEPENDENTLY REVIEWED CALCULATION WBN EEB-MS-TI15-0011 FOR TECHNICAL ADEQUECY AS ADDRESSED IN 10CFR50. APPENDIX B (NEP 3.1, ATTACHMENT 10) THE DESIGN INPUT DATA AND ASSUMPTIONS WERE REVIEWED AND WERE FOUND APPROPRIATE AND REASONABLE. THE CALCULATION METHODS WERE BASED ON BRANCH TECHNICAL INSTRUCTION EEB-TI-09, REVISION 2. THE RESULTS AND CONCLUSIONS ARE ADEQUATE.

Jeffrey T. Mrozek — Design Verifier (Independent Reviewer)
9-20-91 — Date

CALCULATION DESIGN VERIFICATION (INDEPENDENT REVIEW) FORM

WBN-EEB-MS-TI15-0011 — Calculation No.
R14 — Revision

Method of design verification (independent review) used (check method used):

1. Design Review ✓
2. Alternate Calculation
3. Qualification Test

Justification (explain below):

Method 1: In the design review method, justify the technical adequacy of the calculation and explain how the adequacy was verified (calculation is similar to another, based on accepted handbook methods, appropriate sensitivity studies included for confidence, etc.).

Method 2: In the alternate calculation method, identify the pages where the alternate calculation has been included in the calculation package and explain why this method is adequate.

Method 3: In the qualification test method, identify the QA documented source(s) where testing adequately demonstrates the adequacy of this calculation and explain.

INDEPENDENTLY REVIEWED CALCULATION WBN-EEB-MS-TI15-0011 R14 FOR TECHNICAL ADEQUECY AS ADDRESSED IN 10CFR50. APPENDIX B (NEP 3.1, ATTACHMENT 10) THE DESIGN INPUT DATA AND ASSUMPTIONS WERE REVIEWED AND WERE FOUND APPROPRIATE AND REASONABLE.

D. J. Calvelli — Design Verifier (Independent Reviewer)
12/11/01 — Date

CALCULATION DESIGN VERIFICATION (INDEPENDENT REVIEW) FORM

WBN EEB-MS-TI15-0011	15
Calculation No.	Revision

Method of design verification (independent review) used (check method used):

1.	Design Review	*
2.	Alternate Calculation	N/R
3.	Qualification Test	N/R

Justification (explain below):

Method 1: In the design review method, justify the technical adequacy of the calculation and explain how the adequacy was verified (calculation is similar to another, based on accepted handbook methods, appropriate sensitivity studies included for confidence, etc.).

Method 2: In the alternate calculation method, identify the pages where the alternate calculation has been included in the calculation package and explain why this method is adequate.

Method 3: In the qualification test method, identify the QA documented source(s) where testing adequately demonstrates the adequacy of this calculation and explain.

* Independently reviewed calculation WBN EEB-MS-TI15-0011 R15 for technical adequacy as addressed in 10CFR50, Appendix B (NEP 3.1, Attachment 10). The design input data and assumptions were reviewed and were found appropriate and reasonable.

Design Verifier
(Independent Reviewer)

04-21-92
Date

THIS SHEET ADDED BY REVISION 15

PREP TMB DATE 3-8-91
CHK EJH DATE 4/16/91

TABLE OF CONTENTS

Prepared WJBates Date 2/5/90 Checked TBT Date 2-5-90

FSAR COMPLIANCE

FSAR Compliance for RO: This FSAR Compliance Review is performed in accordance with PM 87-31 (EEB).

a. No discrepancies exist between this calculation and the FSAR

b. Applicable FSAR Sections:

8.3.1.4.3

FSAR COMPLIANCE FOR ~~RO~~ R1: SECTION 8.3.1.4.3 WAS REVIEWED. NO DISCREPANCIES WERE NOTED. TMB 4-11-90 | R1

FSAR COMPLIANCE FOR R2: SECTION 8.3.1.4.3 WAS REVIEWED. NO DISCREPANCIES NOTED | R2

FSAR COMPLIANCE FOR R3: SECTION 8.3.1.4.3 WAS REVIEWED. NO DISCREPANCIES NOTED | R3

FSAR COMPLIANCE FOR R4: SECTION 8.3.1.4.3 WAS REVIEWED. NO DISCREPANCIES NOTED. | R4
R4: COMPUTED TMB DATE 6-13-90
CHECKED EJJ DATE 6-13-90

~~FSAR COMPLIANCE FOR~~ R5: SECTION 8.3.1.4.3 WAS REVIEWED. NO DISCREPANCIES NOTED | R5
COMPUTED EJJ DATE 6/13/90
CHECKED CP DATE 6/18/90

SECTION 8.3.1.43 WAS REVIEWED. NO DISCREPANCIES NOTED. | R8

SECTION 8.3.1.4.3 WAS REVIEWED. NO DISCREPANCIES NOTED | R9

SECTION 8.3.1.4.3 WAS REVIEWED. NO DISCREPANCIES NOTED | R10

SECTION 8.3.1.4.3 WAS REVIEWED. NO DISCREPANCIES NOTED | R11
COMPUTED TMB DATE 3-7-91
CHECKED EJJ DATE 4/16/91

SECTION 8.3.1.4.3 WAS REVIEWED. NO DISCREPANCIES NOTED | R13
PREP. BY: Rudy Bodyk 30 SEP91

SECTION 8.3.1.4.3 WAS REVIEWED, NO DISCREPANCIES NOTED | R14
PREP BY Jeffrey J. Mrazek 12-9-91

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JJB 2/5/90 TMB 3-7-91

Prepared JJ Bates Date 2/5/90 Checked TBT Date 2-5-90

1. Purpose

To analyze 480-V non-Class 1E power cables to demonstrate that associated Class 1E power cables are not degraded below an acceptable level.

NRC Regulatory Guide 1.75 and IEEE Standard 384-1981 require that non-Class 1E cables must be separated from Class 1E cables by a minimum distance. If the requirement cannot be met the non-Class 1E circuits must be analyzed to demonstrate that the Class 1E circuits are not degraded below an acceptable level.

1.1 Scope

The scope of this calculation is limited to analysis of 480-V non-Class 1E power cables in seismic Category I structures. These cables and their protective devices were identified. Adequacy and proper number of the protective devices to prevent thermal damage to the non-Class 1E cables due to faults are evaluated. Protection of the cables is evaluated only for the first 10 seconds from the time of initiation of fault.

If a non-Class 1E cable is protected adequately by any of the three following means, the protective devices are not required to be inspected periodically to protect the Class 1E cables it associates with:

two breakers in series,
a breaker and a fuse in series, or
a single fuse.

If a non-Class 1E cable is protected by a single breaker, the breaker must be tested periodically to assure its reliability and to assure that the Class 1E cables it associates with are not degraded below an acceptable level.

This criteria has been evaluated and justified by TVA and is documented in the Watts Bar FSAR, Section 8.3

Output cables from lighting cabinets are generally not within the scope of this calculation. An exception is O-LAC-233-160 which has been included at the request of TVA.

Prepared [illegible] Date 2/5/90 Checked [illegible] Date 2-5-90

Feed cables to 480-V boards are not evaluated in this calculation because they are protected by 6.9-kV breakers and those evaluations are addressed in a separate calculation.

Coordination of the protection system for 480-V 1E loads has been evaluated in a calculation, WBN EEB-MS-TI08-008, which includes breakers supplying power to non-1E loads.

Power cables from 480-V Ice Condenser MCC, 0-MCC-61-1 could not be evaluated because of incomplete and/or inconsistent information found in References 3.1, 3.64, and 3.66, and the TELAS database.

2. Assumptions

2.1 WBNP cable routing system non-QA report of Equipment Loading Report for NV4 non-1E cables, dated January 5, 1990, provides a complete and accurate list for the purpose of this calculation. ~~This is an unverified assumption.~~ R10

2.2 In the above report, location designations with prefixes A, C, K, R and D are in Category I structures. The remaining designations are in non-Category I structures.

2.3 Several power outlets are connected in series by cables. Power to them is supplied through one breaker. Therefore, protection of all these cables are assured by considering only those cables that come out of the MCCs.

2.4 Non-Class 1E power cables that have an end point location in a Category 1 structure, comprise all non-1E cables that are potentially associated circuits. ~~This is an unverified assumption.~~ R10

2.5 For the purpose of this calculation, all 480 V non-Class 1E power cables in Category I structures are assumed to be associated cables.

2.6 ~~AN UNVERIFIED ASSUMPTION (CHANGED BY A, C, K, R, D)~~ PROTECTIVE DEVICES ARE QUALIFIED FOR THE ENVIRONMENT THEY ARE LOCATED IN. ~~THIS~~ R2 R10

3. References

3.1 Watts Bar Nuclear Plant Cable Routing System Equipment Loading Report for NV4 Non-1E cables dated January 5, 1990, a non-QA Report

3.2 WBNP FSAR, Chapter 8, Amendment 62

3.3 480-V Penetration Protection Calculation, EEB-MS-TI08-0015, R0

3.4 Non-1E Power Circuits located in Category I Structures, DS1284E2, R2.

3.5 Associated Cables Analysis, 2GDS211RP, December 15, 1983

Prepared JA Bates Date 2/5/90 Checked TBT Date 2-5-90

3.6 480-V Intake Pumping Station Bd. Single Line, 35N713-1, R10, Wiring Diagram

3.7 480-V Intake Pumping Station MCC, Single Line, 35N713-2, R10, Wiring Diagram

3.8 480V Aux. Bldg. Com Bd, Single Line, 45N731, R9 (0-BD-206-1), Wiring Diagram

3.9 480-V Diesel Aux. Bd 1A1-A, Single Line, 45W732-1, R20 (1-MCC-215-A1), Wiring Diagram

3.10 480-V Diesel Aux. Bd 1A2-A, Single Line, 45W732-2, R15 (1-MCC-215-A2), Wiring Diagram

3.11 480-V Diesel Aux. Bd 1B1-B, Single Line, 45W732-3, R19 (1-MCC-215-B1), Wiring Diagram

3.12 480-V Diesel Aux. Bd 1B2-B, Single Line, 45W732-4, R14 (1-MCC-215-B2), Wiring Diagram

3.13 480-V Diesel Aux. Bd C2-5, Single Line, 45W733-5, R5 (0-MCC-215-C2-S), Wiring Diagram

3.14 480-V Diesel Aux. Bd C2-5, Single Line, 45W733-6, R4 (0-MSS-215-C2-S), Wiring Diagram

3.15 480-V Turb. Bldg. Common MCC A, Single Line, 45W740-1, R11 (0-MCC-207-A), Wiring Diagram

3.16 480-V Fuel and Waste Hdl Bd A, Single Line 45W743-1, 3, R19 (0-MCC-216-A), Wiring Diagram

3.17 480-V Fuel and Waste Hdl Bd B, Single Line 45W743-2, R18 (0-MCC-216-B) Wiring Diagram

3.18 480-V Auxiliary Bldg Com MCC A, Single Line, Sh. 1, 45W744-1, R4 (0-MCC-208-A) Wiring Diagram

3.19 480-V Auxiliary Bldg Com MCC A, Single Line, Sh. 1, 45W744-2, R2 (0-MCC-208-A) Wiring Diagram

3.20 480-V Auxiliary Bldg Com MCC B, Single Line, Sh. 1, 45W744-3, R13 (0-MCC-208-B) Wiring Diagram

3.21 480-V Auxiliary Bldg Com MCC B, Single Line, Sh. 2, 45W744-4, R11 (0-MCC-208-A) Wiring Diagram

HAB 2/15/90
SMH 3-7-90

Prepared GLBate Date 2/5/90 Checked TBT Date 2-5-90

3.22 480-V Auxiliary Bldg Com MCC C, Single Line, Sh. 1, 45W744-5, R11 (O-MCC-208-A) Wiring Diagram

3.23 480-V Lube Oil Board, Single Line 45W745, R12 (O-MCC-218-1) Wiring Diagram

3.24 480-V Chem & Vol Cont Bd A, Single Line, 45W746-1, R11 (O-MCC-217-A) Wiring Diagram

3.25 480-V Chem & Vol Cont Bd B, Single Line, 45W746-2, R11 (O-MCC-217-B) Wiring Diagram

3.26 480-V Unit Bd 1A, Single Line, 45N747-1, R12 (O-BD-203-A) Wiring Diagram

3.27 480-V Unit Bd 1B, Single Line, 45N747-2, R12 (O-BD-203-A) Wiring Diagram

3.28 480-V Cord Denin Wast MCC, Single Line, 45W748, R2 (O-MCC-249-1) Wiring Diagram

3.29 480-V Shutdown Bd 1A1-A, Single Line, 45W749-1, R23 (1-BD-212-A1) Wiring Diagram

3.30 480-V Shutdown Bd 1A2-A, Single Line, 45W749-2, R22 (1-BD-212-A2) Wiring Diagram

3.31 480-V Shutdown Bd 1B1-B, Single Line, 45W749-3, R22 (1-BD-212-B1) Wiring Diagram

3.32 480-V Shutdown Bd 1B2-B, Single Line, 45W749-4, R23, (1-BD-212-B2) Wiring Diagram

3.33 480-V Reactor MOV Bd 1A1, Single Line, Sh. 1 45W751-1, R25 (1-MCC-213-A1) Wiring Diagram

3.34 480-V Reactor MOV Bd 1A1, Single Line, Sh. 2 45W751-2, R18 (1-MCC-213-A1) Wiring Diagram

3.35 480-V Reactor MOV Bd 1A1, Single Line Sh. 3 45W751-3, R21 (1-MCC-213-A1) Wiring Diagram

3.36 480-V Reactor MOV Bd 1A2, Single Line Sh. 4 45W751-4, R26 (1-MCC-213-A2) Wiring Diagram

3.37 480-V Reactor MOV Bd 1A2, Single Line Sh. 5 45W751-5, R22 (1-MCC-213-A2) Wiring Diagram

XMB 2/5/90
TMB 3-7-91

Prepared JSBate Date 2/5/90 Checked TBT Date 2-5-90

3.38 480-V Reactor MOV Bd 1A2, Single Line Sh. 6 45W751-6, R16 (1-MCC-213-A2) Wiring Diagram

3.39 480-V Reactor MOV Bd 1B1, Single Line Sh. 7 45W751-7, R27 (1-MCC-213-B1) Wiring Diagram

3.40 480-V Reactor MOV Bd 1B1, Single Line Sh. 8 45W751-8, R16 (1-MCC-213-B1) Wiring Diagrams

3.41 480-V Reactor MOV Bd 1B1, Single Line Sh. 9 45W751-9, R25 (1-MCC-213-B1) Wiring Diagram

3.42 480-V Reactor MOV Bd 1B2, Single Line Sh. 10 45W751-10, R24 (1-MCC-213-B2) Wiring Diagram

3.43 480-V Reactor MOV Bd 1B2, Single Line Sh. 11 45W751-11, R19 (1-MCC-213-B2) Wiring Diagram

3.44 480-V Reactor MOV Bd 1B2, Single Line Sh. 12 45W751-12, R14 (1-MCC-213-B2) Wiring Diagram

3.45 480-V Turbine MOV Bd 1A, Single Line Sh. 2 45W753-2, R12 (1-MCC-209-A) Wiring Diagram

3.46 480-V Turbine MOV Bd 1A, Single Line Sh. 3 45W753-3, R8 (1-MCC-209-A) Wiring Diagram

3.47 480-V Turbine MOV Bd 1C, Single Line Sh. 6 45W753-6, R10 (1-MCC-209-C) Wiring Diagram

3.48 480-V Reactor Building Vent. Board 1A-A, Single-Line Sh. 1, 45W755-1, R13 (1-MCC-232-A-A)

3.49 480-V Reactor Building Vent. Board 1A-A, Single-Line Sh. 2, 45W755-2, R16 (1-MCC-232-A-A)

3.50 480-V Reactor Building Vent. Board 1A-A, Single-Line Sh. 1, 45W755-3, R14 (1-MCC-232-B-B)

3.51 480-V Reactor Building Vent. Board 1A-A, Single-Line Sh. 2, 45W755-4, R13 (1-MCC-232-B-B)

3.52 480-V Control and Auxiliary Building Vent. Board 1A1-A, Single-Line Sh. 1, 45W756-1, R25 (1-MCC-214-A1-A)

3.53 480-V Control and Auxiliary Building Vent. Board 1A1-A, Single-Line Sh. 2, 45W756-2, R31 (1-MCC-214-A1-A)

Prepared GS Bate Date 2/5/90 Checked TBT Date 2-5-90

3.54 480-V Control and Auxiliary Building Vent. Board 1A2-A, Single-Line Sh. 1, 45W756-3, R23 (1-MCC-214-A2-A)

3.55 480-V Control and Auxiliary Building Vent. Board 1A2-A, Single-Line Sh. 2, 45W756-4, R11 (1-MCC-214-A2-A)

3.56 480-V Control and Auxiliary Building Vent. Board 1B1-B, Single-Line Sh. 1, 45W756-5, R8 (1-MCC-214-B1-B)

3.57 480-V Control and Auxiliary Building Vent. Board 1B1-B, Single-Line Sh. 2, 45W756-6, R31 (1-MCC-214-B1-B)

3.58 480-V Control and Auxiliary Building Vent. Board 1B2-B, Single-Line Sh. 1, 45W756-7, R17 (1-MCC-214-B2-B)

3.59 480-V Control and Auxiliary Building Vent. Board 1B2-B, Single-Line Sh. 2, 45W756-8, R15 (1-MCC-214-B2-B)

3.60 480-V Turbine Building Vent. Board 1A, Single-Line, Sh. 1, 45W757-1, R16 (1-MCC-210-A)

3.61 480-V Turbine Building Vent. Board 1A, Single-Line, Sh. 2, 45W757-2, R10 (1-MCC-210-A)

3.62 480-V Turbine Building Vent. Board 1B, Single-Line, Sh. 1, 45W757-3, R10 (1-MCC-210-B)

3.63 480-V Turbine Building Vent. Board 1B, Single-Line, Sh. 2, 45W757-4, R11 (1-MCC-210-B)

3.64 480-V Ice Condensing System MCC, Westinghouse Drawing 1458F09, (0-MCC-61-1), Contract No. 73C62-54114-1

3.65 TVA Design Standard ~~DS-E12-63~~ DS E12.6.3 TMB 3-8-91, R1, November 5, 1986 R11

3.66 WBNP walkdown data for ~~non-1E boards and breakers in Category I structures, January 1990.~~ NON-CLASS 1E EQUIPMENT (B26900201400) TMB 3-8-91

3.67 TVA Detailed Design Criteria, No. WB-DC-30-13, Title: 10 CFR 50, Appendix R, Type I, II, and III, Circuits Issue Date: ~~August 13, 1985~~ REV. 2 (B26900213076) TMB 3-8-91 R11

3.68 Calculation WBN EEB-MS-TI08-0008, RO for 480-V 1E Coordination and Protection Review, prepared concurrently with this calculation.

3.69 WBN Calculation No. WBN-EEB-MS-TI05-0001, RO: TVA Auxiliary Power System (TELAS 1.0)

3.70 WBN Calculation No. WBN-EEB-MS-TI08-0015, RO: Watts Bar NP Containment Penetration Protection Study, Voltage Level V4, V5, Appendix A

3.71 WATTS BAR DESIGN CRITERIA, WB-DC-30-4, R5 (7-27-88), SEPARATION/ISOLATION R11

GLB 2/15/90 TMB 3-7-91

Prepared JSBate Date 2/5/90 Checked TBT Date 2-5-90

4. Design Input Data

4.1 The cables considered in this calculation were selected from Reference 3.1.

4.2 Protective devices for each cable were identified from WBNP Single-Line Diagrams of the MCCs and Boards, Reference 3.6 to 3.64.

4.3 Data for the protective devices were obtained from Reference 3.4 and 3.66 and are listed in Appendix H.

4.4 Cable type for each cable was obtained from Reference 3.1. It was compared with Reference 3.65 to determine the temperature rating of the insulation. All the cables in this calculation have insulation temperature rating of 90 degrees Celsius.

4.5 Manufacturer, model number, and rating of primary protective devices in this calculation were verified with walkdown data, Reference 3.66.

4.6 Acceptance criteria developed in Attachment 1 were used to determine adequacy of the protective devices in preventing damage to insulation of each cable.

5. Documentation of Assumptions

5.1 The assumption (2.1) that the non-QA report provides a complete and accurate list of NV4 non-1E cables is ~~unverified. DOCUMENTED~~ justified IN ATTACHMENT NO. UVA2.1/2.4. GP 2/20/90 | RIO

5.2 The assumption (2.2) that only the prefixes A, C, K, R, and D are used for location designations of Category I structures has been verified by FSAR Table 3.2-1 with the list of prefixes used.

5.3 The assumption (2.3) that where several power outlets are connected in series, all cables in that circuit are protected by virtue of the fact that the first one has been protected was verified by reviewing the cables to assure that all cables in the series are of the same size as the feed cable.

5.4 The assumption (2.4) that identifies all potentially associated circuits, is ~~unverified. DOCUMENTED~~ justified IN ATTACHMENT NO. UVA2.1/2.4 GP 2/20/90 | RIO

5.5 The assumption (2.5) that all non-Class 1E power cables in Category I structures are assumed to be associated cables is a conservative assumption. By reviewing all cables that could potentially be associated, and assuming that they all are, we have covered the worst case.

5.6 THIS UNVERIFIED ASSUMPTION MAY BE REMOVED FROM THIS CALCULATION SINCE THE ENVIRONMENTAL QUALIFICATION OF CIRCUIT BREAKERS IS BEING TRACKED (AND WILL BE RESOLVED) UNDER OPEN ITEM NO. 1 IN EQ BINDER NO. WBN EQ BKRA-002. | RIO

MJB 2/5/90 TMB 3-7-91

Prepared JS Bate Date 2/5/90 Checked TBT Date 2-5-90

6. Computation and Analyses

6.1 Associated cables were selected from WBNP cable routing system non-QA report of Equipment Loading Report for NV-4, non-1E cables, dated January 5, 1990, (Reference 3.1). This report is a computer sort with the following fields: Cable ID, Cable Type, NC1/NC2, MCM/AWG, From and To Equipment IDs, From and To Locations, and For. ~~Even though the report is non-QA, it is assumed that the sort is complete and accurate.~~ All cables from 480-V boards and MCCs in non-Category I structures, running to Category I structures or located totally within Category I structures are the only group of cables considered in this calculation. R10

6.2 NV-4 cables are defined as non-safety-related low voltage power cables (480-V power cables and all ac and dc power cables of 250 V or less that carry 30 A or more). This criteria is defined in the TVA FSAR, Chapter 8.

6.3 Data for the protective devices for the cables are obtained from the following sources:

1. Associated Cables Analysis, 2GDS211RP, 12/15/83 (Ref. 3.5)
2. Non-1E Power Cables Located in Category I Structures, DS1284E2, R2 (Ref. 3.4)
3. Walkdown Data (Ref. 3.66)

Walkdown data are considered to be the most reliable and are relied upon. Drawings were used only for informational purposes. Data for the cables and their protective devices are tabulated in Appendix H.

6.4 Adequacy of the protective devices to protect associated 1E cables is evaluated using the acceptance criteria attached with this calculation as Attachment 1. Time-current characteristic curves of each cable and its protective devices are compared. The protective devices which are evaluated to be inadequate are listed in Appendix F.

6.5 Circuits were also reviewed to determine if they contained the proper protective devices; i.e., two breakers in series, one fuse and one breaker in series, or one fuse. Circuits not meeting this criteria are listed in Appendix G.

7. Supporting Graphics

Time-current curves for protective devices, which were used in developing the acceptance criteria for the protection of 480-V non-Class 1E cables are attached in Appendices C and D.

8. Summary of Results

8.1 Appendix F lists 480-V power cables' associated circuits whose protective devices were evaluated to be inadequate for acceptance criteria developed in Attachment 1.

8.2 Appendix G lists 480-V power cables' associated circuits whose protective devices do not fall in any of the three categories stated below:

1. Two breakers in series.
2. One breaker and a fuse in series.
3. One fuse.

8.3 SEE "RESULTS/CONCLUSIONS" IN ATTACHMENT UVA2.1/2.4 FOR ADDITIONAL CIRCUITS RII

9. Conclusions

9.1 Protection meeting the acceptance criteria of Attachment 1 needs to be provided for the circuits listed in Appendix F. The circuits listed in Appendix G require periodic testing of their breakers or design modification to assure reliability of their protection in accordance with FSAR, Chapter 8.

9.2 SEE "RESULTS/CONCLUSIONS" IN ATTACHMENT UVA2.1/2.4 FOR ADDITIONAL CIRCUITS RII

Prepared H. Ahl Date 2/2/90 Checked TmB Date 2/2/90

I REVIEW SUMMARY

REVISION 0 – ALL PAGES

TEXT PAGES 1-24
APPENDIX A PAGES A0-A5
~~APPENDIX B PAGES B0-B17~~ R11
APPENDIX C PAGES C0-C27
APPENDIX D PAGES D0-D16
APPENDIX E PAGES E0-E1

Prepared HA Date 2/2/90 Checked JMT Date 2/2/90

II. QA CALCULATION REVIEW CHECKLIST

TYPE OF CALCULATION

[X] 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)

[X] 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 computer output is identified by the computer program number, calculation number and run date. (MUST BE PERFORMED)

[ ] 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: [signature] Date: 1/27/90

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480 V Power Cable Associated Circuits
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III. Table of Contents

Cont'd

Table of Content (Cont'd)

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1. Introduction

NRC Regulatory guide 1.75 and IEEE Standard 384-1981 require that the non-class 1E cables must be separated from class 1E and associated circuits by minimum separation distance. If the minimum separation distance is not maintained, the non 1E circuits must be analyzed to demonstrate that the class 1E circuits are not degraded below an accepted level.

The cable installation practices for the non class 1E cables at the Watts Bar Nuclear Station (WBNS) do not lend themselves in meeting the minimum separation criteria for the Non-1E cables and therefore analyses need to be performed to demonstrate that class 1E circuits are not degraded below an accepted level.

2. Purpose

Non class 1E Cables when faulted or overloaded could initiate a fire or cause nearby class 1E cables to fail due to their proximity. The protective device for the non class 1E Cables should clear the faults or overload conditions before any damage to the nearby class 1E Cables or a fire could take place.

The purpose of this calculation is to identify the maximum rating of the protective devices for non class 1E Cables at 480V level which will prevent thermal damage to the non-1E Cables through 10 seconds time limit. The identification of the protective devices based on the prevention of thermal damage beyond 10 seconds region is outside the scope of this calculation.

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3. ASSUMPTIONS

None

4. Documentation of Assumptions.

None

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5. SOURCES OF DESIGN INPUT INFORMATION (Reference)

5.1. TVA Calculation 2GDS211 RP, Revision 0
"Associated Cable Analysis" prepared 12/15/83

5.2. Gould Shawnut Form 600 Amp-Trap
Current Limiting Fuse — Bulletin AT615

5.3. DIT No. WB-EPED-0010-00
Non IE Cables Covered in this Calculation are rated for 90°C Continuous temperature operation

5.4 Sargent & Lundy Standard ESC-193
revised 11-28-89

5.5 UL 489 Standard for Safety,
"Molded-Case Circuit Breakers and Circuit-Breaker Enclosures",
September 15, 1986, 7th Edition

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6. METHODOLOGY

6.1. Identify different sizes of Non-class 1E cables that are not appropriately separated from class 1E circuits. Identify different types of protective devices used on those non-1E cables.

This will be done by using table 2 of Appendix E of TVA calculation 2CDS211RP revision 0. (Reference 5.1). this table will be used to generate a table of non-1E cable sizes listing different types of Protective devices used on their circuits.

6.2. Establish the following temperature ratings of the non-class 1E cables that are mixed together with 1E cables in cable Trays.

- Normal operating Temperature
- Emergency over load temperature
- Short Circuit Temperature
- Auto Ignition Temperature

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6.3. Establish the maximum short circuit current-time capability of non 1E Cables for duration upto 10 seconds

6.4. Use the Time-Current Curves included in the TVA Calculation 2CyDS 211 RP revision 0 (reference 5.1) to determine the maximum rating of the protective devices which will protect the non-1E Cables through 10 seconds. The time-Current characteristics shown in those curves for duration beyond 10 seconds will be ignored since thermal damage Consideration beyond 10 seconds duration is out-side the scope of this Calculation.

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6.5. Analyze that nearby class 1E cables will not be exposed to degradation even if the conductor temperature in non class 1E cable is raised above 500°C during the high magnitude fault clearing time

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7. Input Data

7.1. According to reference 5.3 the review of the non-1E Cables Covered in this Calculation are rated for 90°C Continuous temperature operation.

According to reference 1 the other temperature ratings of the 90°C Cables are:

Short time Overload Temperature — 130°C
Short Circuit temperature — 250°C
Auto Ignition Temperature — 500°C

8. Computation and Analysis

8.1. Using Table 2 of Appendix E in Reference 5.1 a table was prepared which listed different types of protective devices used on Non 1E Cables. This table is included in Appendix B of this Calculation.

8.2. The Non Class 1E Cables are rated for Continuous operation at 90°C (Ref. 5.3) Time Current Curves in Appendix C of reference 1 show the thermal damage Curve of Cables rated for 250°C short Circuit Current. Using these Curves and Comparing the tripping Characteristics of the protective devices (included in Appendix D of Reference 5.1) a table was generated which show the Maximum rating and/or the setting of the

protective devices which will protect the Non 1E Cable against thermal damage through the duration upto 10 seconds. This table is included in Appendix A of this calculation.

8.3. Appendix C of this Calculation includes those Time Current Curves of Reference 5.1 which have been used to prepare the table in item 2 above. The curve marked as "TD" on these time current curves indicate the thermal Damage characteristic of the 90°C rated Cable when the Conductor temperature reaches 250°C. The Curve labeled as "AI" indicates the characteristic of the 90°C rated Cable when the Conductor temperature reaches 500°C. These Curves are based on Under Donk Equation of Reference 5.1

8.4. Appendix D of this calculation includes those time-current characteristic of the protective devices which have been used to prepare the table in item 2 above

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8.5 a review of the time current curves in Appendix C indicates that the molded case circuit breakers will interrupt the fault current in about 0.012 seconds. And, depending on the trip device setting, the fault clearing time by the DC breakers could be as high as 0.5 seconds — assuming the maximum available DC breaker time delay setting. The MCC feeder breakers are the only circuit breakers requiring time delay based on coordination considerations. The actual time delay used on the MCC feeders can and should be less than 0.5 seconds (0.18 seconds expected) to allow for coordination with the switchgear main feed circuit breakers.

It is the purpose of this analysis

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to demonstrate that high magnitude fault currents on the non-1E cables, when cleared as discussed above, will not cause a failure of the nearby 1E cables. This conclusion is reached based on the following considerations for the instantaneous and time delayed fault clearing.

A. Instantaneous fault clearing.

-UL Standard No 489 entitled "Molded Case Circuit breakers and circuit breaker enclosures" ref (5.5) requires in section 21.1 that cables used during the short circuit breaker testing shall not suffer damage.

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Depending on the circuit breaker sizes, cables as small as #14 AWG are used during the UL 489 Tests.

The short circuit current magnitudes used for the testing are, depending on the breaker size, between 10KA and 70 KA.

- The cables used in the UL 489 tests are of a lower quality than the cables utilized at WBN (Section 21.8 of the UL 489 Standard identifies the cables as TW or THW rated at 60°C)

- We are familiar with several proprietary tests, conducted by independent

testing organizations for different utilities, which confirm that the requirement of the UL 489 Standard about no cable damage during a high magnitude fault are indeed met. These tests show that not only faulted cables are not damaged but their insulation remains intact

B Time delay tripping on MCC feeder cables.

The smallest expected cable sizes are feeds to the MCC's are 4/0. Utilizing the Neher Donk formula from Ref 5.1, we will conservatively calculate the temperature that a

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4/0 cable copper conductor can reach with 50KA flowing through it for 0.18 sec. The 50KA short circuit current was conservatively chosen since it is equal to the interrupting rating of some 480V switchgear circuit breakers.

$$\left[\frac{I}{Cm}\right]^2 t = 0.0297 \log_{10} \frac{T_2+234}{T_1+234}$$

$T_1 = 90°C$

$I = 50000$

$Cm = 211600$

$t = 0.18$ seconds

$$\left[\frac{50000}{211600}\right]^2 (0.18) = 0.0297 \log_{10} \frac{T_2+234}{90+234}$$

$$0.3384 = \log_{10} \frac{T_2+234}{90+234}$$

TMB 3-7-91

$$2.18\,(90+234) = T_2 + 234$$

$$T_2 = 472^\circ C$$

The resulting copper temperature is 472°C which is below the 500°C cable autoignition temperature.

Furthermore, it should be noted that with the copper at 472°C the outside of the cable insulation would be at a much lower temperature. Industry tests referred to in section A earlier indicate that the cable outside insulation will be at about 250°C

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The above illustrates that the MCC feeder cables when faulted will not cause damage to the surrounding cables.

It is therefore concluded from the above discussion that the surrounding cables are not damaged during heavy short circuits even if the conductor temperature of the faulted cable exceeds 250°C.

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9. Supportings Graphics

the time - Current characteristic Curves of the Non 1E Cables and the protective devices are included in Appendix C and D of this Calculation

10. Summary of Results

This Calculation has determined the maximum rating and/or the settings of the protective devices which will prevent the thermal damage to the non-class 1E Cables through 10 seconds period. The results are applicable for 250°C short circuit temperature rated Copper Cables. The results are tabulated and included in Appendix A Of this

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the Calculation has determined that the surrounding Cables will not be damaged, even if the Conductor temperature on the faulted Cable may exceed its 250°C short circuit temperature rating as the fault will be quickly cleared by its protective device. The faulted Cable, however, should be replaced.

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II. Conclusion

The protective devices on Non 1E Cable, whose rating and/or setting does not exceed the maximum rating/setting listed in Appendix A, will protect the near by Class 1E Cables against thermal damage, provided the fault on the non-1E cable is cleared within 10 seconds.

The conductor temperature of non-1E cable may rise beyond its 250°C short circuit-temperature rating during the fault clearing delay. The faulted non-1E cable, in such event, should be replaced.

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APPENDIX A

MAXIMUM RATING OF PROTECTIVE DEVICES FOR 90°C RATED CABLES 0- 10 SECOND REGION

90°C RATED CABLE PROTECTION (0-10 SEC REGION ONLY)

CABLE SIZE	MAXIMUM PROTECTIVE DEVICE RATING	REFERENCE	
#14 AWG	- SQ.D - QOB-25A - BUSSMAN - ~~FRS 15A~~ FRN 15A - MAG ONLY BKR SETG. PLUS TOLERANCE LOWER THAN 80A BUSSMAN - KWN 25A - SHMT - A4J - 30A	TC-109 TC-118	Appendix C
#12 AWG	- SHMT - TRS-20A	TC-64	Appendix C
	- SQD - QOB140 - ITE - EF3 B030 - MAG. ONLY BKR SETG. PLUS TOLERANCE LOWER THAN 140A	TC-112 TC-77	App. C
#10 AWG	- SHMT - TRS30A - ITE - EF3B040 - SQ.D - QOB150 - MAG. ONLY BKR, SETG. PLUS TOLERANCE LOWER THAN 225A - HFCP - 15A	TC-38 TC-39 TC-117	App. C

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90°C RATED CABLE PROTECTION (0-10 SEC. REGION ONLY)

CABLE SIZE	MAXIMUM PROTECTIVE DEVICE RATING	REFERENCE
#8 AWG	- SHAWMUT A6Y - 100A	MFTR BULLETIN AT 615 (APP. D)
	- ITE-EF3 B070	TC-123, TC-70, TC-67 } APP. C
	- SHMT - TRS 60A	
	- MAG ONLY BKR SETG. PLUS TOL. BELOW 350A	
	- SHMT - HFCP 30A	
	- SHMT - A4J - 100A	
#6 AWG	- MAG ONLY BKR SETTING PLUS TOLERANCE SHOULD BELOW 550A	TC-68 (APP. C)
	- ITE - EF3 B100	TC-17 (APP. C)
	- ITE - FJ BREAKERS CAN'T BE USED	SHEET ~~D6~~ D6 (APP D) RII
	- SHMT - TRS 70A	TC-56 (APP. C)
	- SHMT - HFCP 50A	
#4	- W JA-70A	TC-84, TC-30 } APP. C
	- GOULD RFS-100A (THE USE OF HIGHER RATED FUSE SHOULD BE INVESTIGATED)	
	- THE USE OF ITE-FJ BKR NEED INVESTIGATION	SHEET ~~D6~~ D6 (APP. D) RII
	- MAG. ONLY BKR SETTING PLUS TOLERANCE BELOW 900A	TC-84 (APP. C)

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* 90°C RATE CABLE PROTECTION (0–10 SEC. REGION ONLY) *

	CABLE SIZE	MAXIMUM PROTECTIVE DEVICE RATING	REFERENCE	
	#2	– W JA 125A	TC-83	App. C
		– W DS BKR 150A SENSOR LT DELAY @ 12 SEC. ST OR INSTANT PICK UP < 600% (THE USE OF OTHER SETTINGS SHOULD BE INVESTIGATED)	TC-6	App. C
		~~D=15~~ D2 (App. D)		RII
		– SHMT – CP6 – 4/0		
		– SHMT – CP6A-2/0		
		– MAG ONLY BKR SETTING PLUS TOLER. LOWER THAN 1200A	TC-6	(App. C)
		– SHMT – HFCP – 100A		
*		– BUSSMANN JJS 225		
	#1/0	– FP FUSEMATIC 100A	TC-4	(App. C)
		– ITE – FJ-B125 (THE USE OF HIGHER RATED BKR SHOULD BE INVESTIGATED)	TC-80	(App. C)
		– SHMT – CP6A – 4/0		
		– SHMT – CP6 – 350MCM		
		– MAG ONLY BKR SETG. PLUS TOLERANCE LOWER THAN 2000A		
*		– BUSSMANN JJS 400		

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90°C RATED CABLE PROTECTION (0-10 SEC. REGION ONLY)

CABLE SIZE	MAXIMUM PROTECTIVE DEVICE RATING	REFERENCE	
# 2/0 AWG	W DS BKR SENSOR 150A LT DELAY @ 36 SEC. INST or SHRT TIME PU upto 12 TIMES SENSOR RATING (THE USE OF OTHER SETTINGS SHOULD BE INVESTIGATED	TC-91 & ~~D16~~ D2 (APP. C) (APP. D)	RII
#4/0 AWG	ITE-FJ3B225	TC-27 & ~~D21~~ D6 (APP. C & D)	RII
	W DS BKR SENSOR 300A LT DELAY @ 36 SEC INST or SHORTTIME PU UPTO 12 TIMES SENSOR RATING (THE USE OF OTHER SETTINGS SHOULD BE INVESTIGATED	TC-7 & ~~D16~~ D2 (APP. C & D)	
	SHMT-CP6A-350MCM		
	SHMT-CP6-750 MCM		
	SHMT-CP-750 MCM		

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90°C RATED CABLE PROTECTION (0-10 SEC. REGION ONLY)

CABLE SIZE	MAXIMUM PROTECTIVE DEVICE RATING	REFERENCE	
300 MCM	-W JA 225A -W LA 400A -W DS BKR SENSOR 600A LT Delay @ 20 Sec. INSTANT OR SHORT TIME PU UP TO 12 TIMES SENSOR RATING (THE USE OF OTHER SETTINGS SHOULD BE INVESTIGATED) -SHMT CP6-1000MCM -SHMT-CP6A-500MCM	TC-86 & ~~D12~~ D1 TC-33 & ~~D13~~ D3 TC-89 & ~~D16~~ D2	APP. C&D R11
400 MCM	SHMT CPGA UPTO 1000 MCM	TC-13 & ~~D-22~~ D4	(APP. C&D) R11

NOTES

1) THE MAXIMUM PROTECTIVE DEVICES LISTED AGAINST A 90° CABLE WILL PROTECT THAT CABLE THROUGH 0-10 SECONDS.

2) THE MAXIMUM PROTECTIVE DEVICES LISTED AGAINST A CABLE SIZE WILL ALSO PROTECT LARGER DIAMETER CABLES OF 90°C RATING THROUGH 10 SEC.

3) THE DIAMETER OF A CABLE INCREASES AS THE AWG NUMBER DECREASES FROM #14 TO #1

QA REPORT CONDUIT ID		NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VER STAT
B	1223	4	3.0 P	C	25	0.000	2.290	2.712	7.390	0.000	5.254	2		291	V

CABLES ROUTED IN CONDUIT:

B	84	1*1	WDQ	NC1:	2	CAB CSA:	1.356	CAB WT: 2.627	TOTAL CSA:	2.712	TOTAL WT: 5.254
	TOTALS									2.712	5.254

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QA REPORT CONDUIT ID		NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VER STAT
B	1224	4	3.0 P	C	25	0.000	2.290	2.712	7.390	0.000	5.254	2		291	V

CABLES ROUTED IN CONDUIT:

B	B3	1*1	WDQ	NC1:	2	CAB CSA:	1.356	CAB WT: 2.627	TOTAL CSA:	2.712	TOTAL WT: 5.254
TOTALS										2.712	5.254

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WBN EEB-MS-TI15-0011, REV. 10

QA REPORT CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VER STAT
B 1225	4	3.0 P	C	25	0.000	2.290	2.712	7.390	0.000	5.254	2		291	V

CABLES ROUTED IN CONDUIT:

B 88 1*1 WDQ NC1: 2 CAB CSA: 1.356 CAB WT: 2.627 TOTAL CSA: 2.712 TOTAL WT: 5.254

TOTALS 2.712 5.254

QA REPORT CONDUIT ID		NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VER STAT
B	1226	4	3.0 P	C	25	0.000	2.290	2.712	7.390	0.000	5.254	2		291	V

CABLES ROUTED IN CONDUIT:

B	89	1*1	WDQ	NC1:	2	CAB CSA:	1.356	CAB WT: 2.627	TOTAL CSA:	2.712	TOTAL WT: 5.254
TOTALS										2.712	5.254

PAGE 49
ATTACHMENT NO. UVA 2.1/2.4
W&NEEB-MS-TI15-0011, REV. 10

QA REPORT CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VER STAT
B 1227	4	3.0 P	C	25	0.000	2.290	2.712	7.390	0.000	5.254	2		291	V

CABLES ROUTED IN CONDUIT:

B 94 1*1 WDQ NC1: 2 CAB CSA: 1.356 CAB WT: 2.627 TOTAL CSA: 2.712 TOTAL WT: 5.254

TOTALS 2.712 5.254

QA REPORT CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VER STAT
B 1228	4	3.0 P	C	25	0.000	2.290	2.712	7.390	0.000	5.254	2		291	V

CABLES ROUTED IN CONDUIT:

B	93	1#1	WDQ	NC1:	2	CAB CSA:	1.356	CAB WT: 2.627	TOTAL CSA:	2.712	TOTAL WT:	5.254
TOTALS										2.712		5.254

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ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI/5-0011, REV. 10

QA REPORT CONDUIT ID		NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VER STAT
B	1229	4	3.0 P	C	25	0.000	2.290	2.712	7.390	0.000	5.254	2		291	V

CABLES ROUTED IN CONDUIT:

B	98	1*1	WDQ	NC1:	2	CAB CSA:	1.356	CAB WT: 2.627	TOTAL CSA:	2.712	TOTAL WT: 5.254
TOTALS										2.712	5.254

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VER STAT
B 1230	4	3.0 P	C	25	0.000	2.290	2.712	7.390	0.000	5.254	2		291	V

CABLES ROUTED IN CONDUIT:

B	99	1*1	WDQ	NC1:	2	CAB CSA:	1.356	CAB WT: 2.627	TOTAL CSA:	2.712	TOTAL WT: 5.254
TOTALS										2.712	5.254

QA REPORT CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VER STAT
B 1253	4	3.0 P	C	5	0.000	2.290	2.712	7.390	0.000	5.254	2		292	V

CABLES ROUTED IN CONDUIT:

B	64	1*1	WDQ	NC1:	2	CAB CSA:	1.356	CAB WT: 2.627	TOTAL CSA:	2.712	TOTAL WT:	5.254
TOTALS										2.712		5.254

WATTS BAR NUCLEAR PLANT CONDUIT REPORT — PAGE 42 — DATE 12/16/90

QA REPORT CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VER STAT
B 1252	4	3.0 P	C	5	0.000	2.290	2.712	7.390	0.000	5.254	2		292	V

CABLES ROUTED IN CONDUIT:

B	83	1*1	WDQ	NC1:	2	CAB CSA:	1.356	CAB WT: 2.627	TOTAL CSA:	2.712	TOTAL WT:	5.254
TOTALS										2.712		5.254

PAGE 55
ATTACHMENT NO. UVA 2.1/2.4
W&N EEB-MS-TI15-0011, REV. 10

QA REPORT CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VER STAT
B 1254	4	3.0 P	C	5	0.000	2.290	2.712	7.390	0.000	5.254	2		292	V

CABLES ROUTED IN CONDUIT:

B	88	1#1	WDQ	NC1:	2	CAB CSA:	1.356	CAB WT: 2.627	TOTAL CSA:	2.712	TOTAL WT:	5.254
TOTALS										2.712		5.254

PAGE 56
ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI15-0011, REV. 10

WATTS BAR NUCLEAR PLANT CONDUIT REPORT — PAGE 44 — DATE 12/16/90

QA REPORT CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VER STAT
B 1255	4	3.0 P	C	5	0.000	2.290	2.712	7.390	0.000	5.254	2		292	V

CABLES ROUTED IN CONDUIT:

B	89	1*1	WDQ	NC1:	2	CAB CSA:	1.356	CAB WT: 2.627	TOTAL CSA:	2.712	TOTAL WT: 5.254
TOTALS										2.712	5.254

QA REPORT CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VER STAT
B 1285	4	3.0 P	C	20	0.000	2.290	2.712	7.390	0.000	5.254	2		292	V

CABLES ROUTED IN CONDUIT:

B 93 1*1 WDQ NC1: 2 CAB CSA: 1.356 CAB WT: 2.627 TOTAL CSA: 2.712 TOTAL WT: 5.254

TOTALS 2.712 5.254

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VER STAT
B 1286	4	3.0 P	C	20	0.000	2.290	2.712	7.390	0.000	5.254	2		292	V

CABLES ROUTED IN CONDUIT:

B 94 1*1 WDQ NC1: 2 CAB CSA: 1.356 CAB WT: 2.627 TOTAL CSA: 2.712 TOTAL WT: 5.254

TOTALS	2.712	5.254

QA REPORT CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VER STAT
B 1280	4	3.0 P	C	20	0.000	2.290	2.712	7.390	0.000	5.254	2		292	V

CABLES ROUTED IN CONDUIT:

B	98	1x1	WDQ	NC1:	2	CAB CSA:	1.356	CAB WT: 2.627	TOTAL CSA:	2.712	TOTAL WT:	5.254
TOTALS										2.712		5.254

QA REPORT CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VER STAT
B 1281	4	3.0 P	C	20	0.000	2.290	2.712	7.390	0.000	5.254	2		292	V

CABLES ROUTED IN CONDUIT:

B	99	1*1	WDQ	NC1:	2	CAB CSA:	1.356	CAB WT: 2.627	TOTAL CSA:	2.712	TOTAL WT:	5.254
TOTALS										2.712		5.254

PAGE 61
ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI15-0011, REV. 10

QA REPORT CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VER STAT
PLC 2472	4	1.5 I	C	70	0.000	1.081	0.213	2.040	0.000	0.246	1		290	V

CABLES ROUTED IN CONDUIT:

PL 4407 1x1 WFC-1 NC1: 1 CAB CSA: .213 CAB WT: 0.246 TOTAL CSA: .213 TOTAL WT: .246

TOTALS .213 .246

QA REPORT CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VER STAT
PLC 3140	4	1.5 I	C	60	0.000	.632	1.017	2.040	0.000	1.265	2		290	V

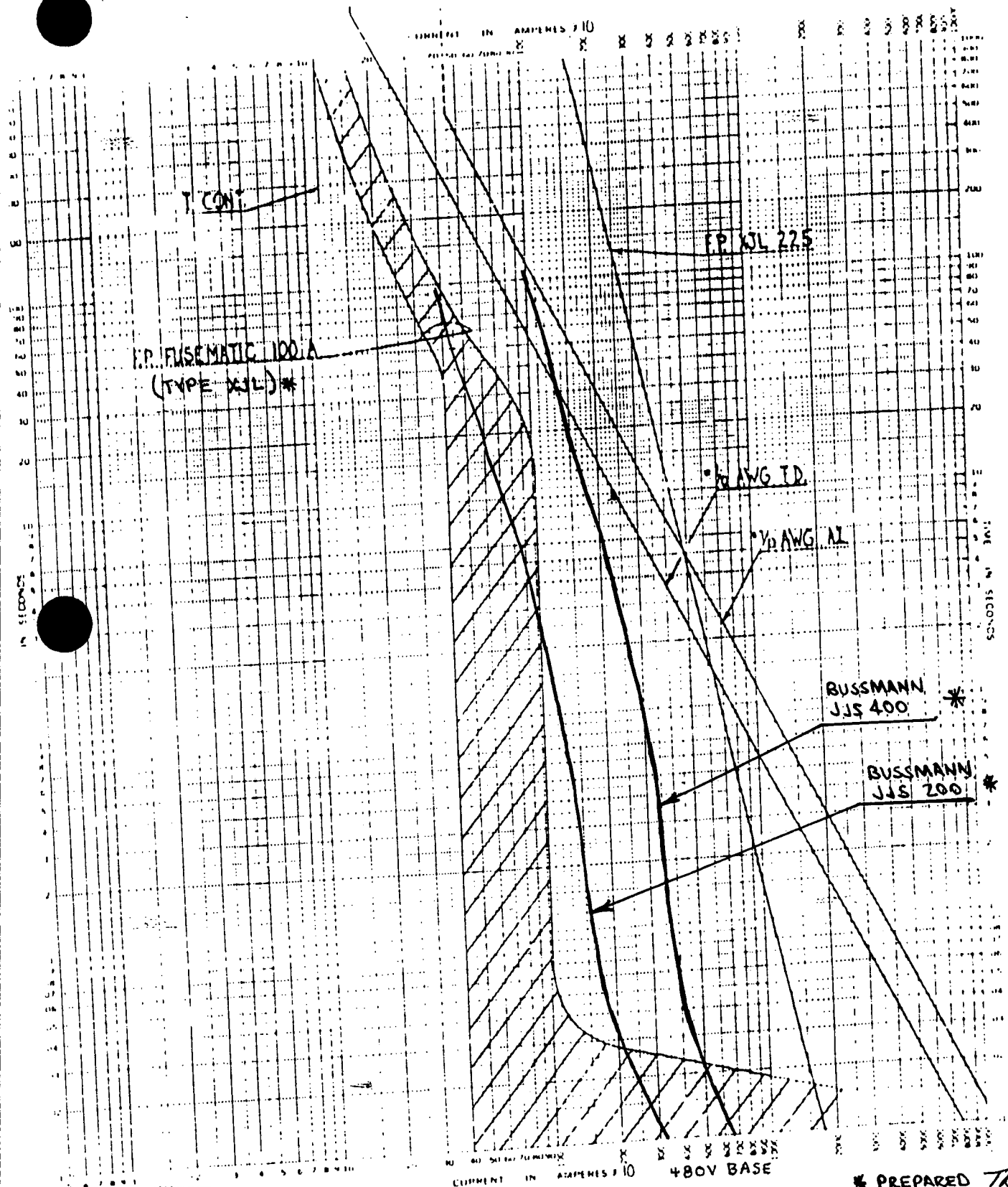
CABLES ROUTED IN CONDUIT:

ABN	755	1*1	WFA-4	NC1:	1	CAB CSA:	0.377	CAB WT:	0.430	TOTAL CSA:	.377	TOTAL WT:	.430	
PL	6280	1*1	WFA-2	NC1:	1	CAB CSA:	.640	CAB WT:	0.835	TOTAL CSA:	.640	TOTAL WT:	.835	
TOTALS											1.017		1.265	

APPENDIX C

CABLE PROTECTION

TIME - CURRENT CURVES



RII

* PREPARED TRT 2-5-90
* VERIFIED [illegible] 2-5-90

RII COMPUTED TMB DATE 3-7-91

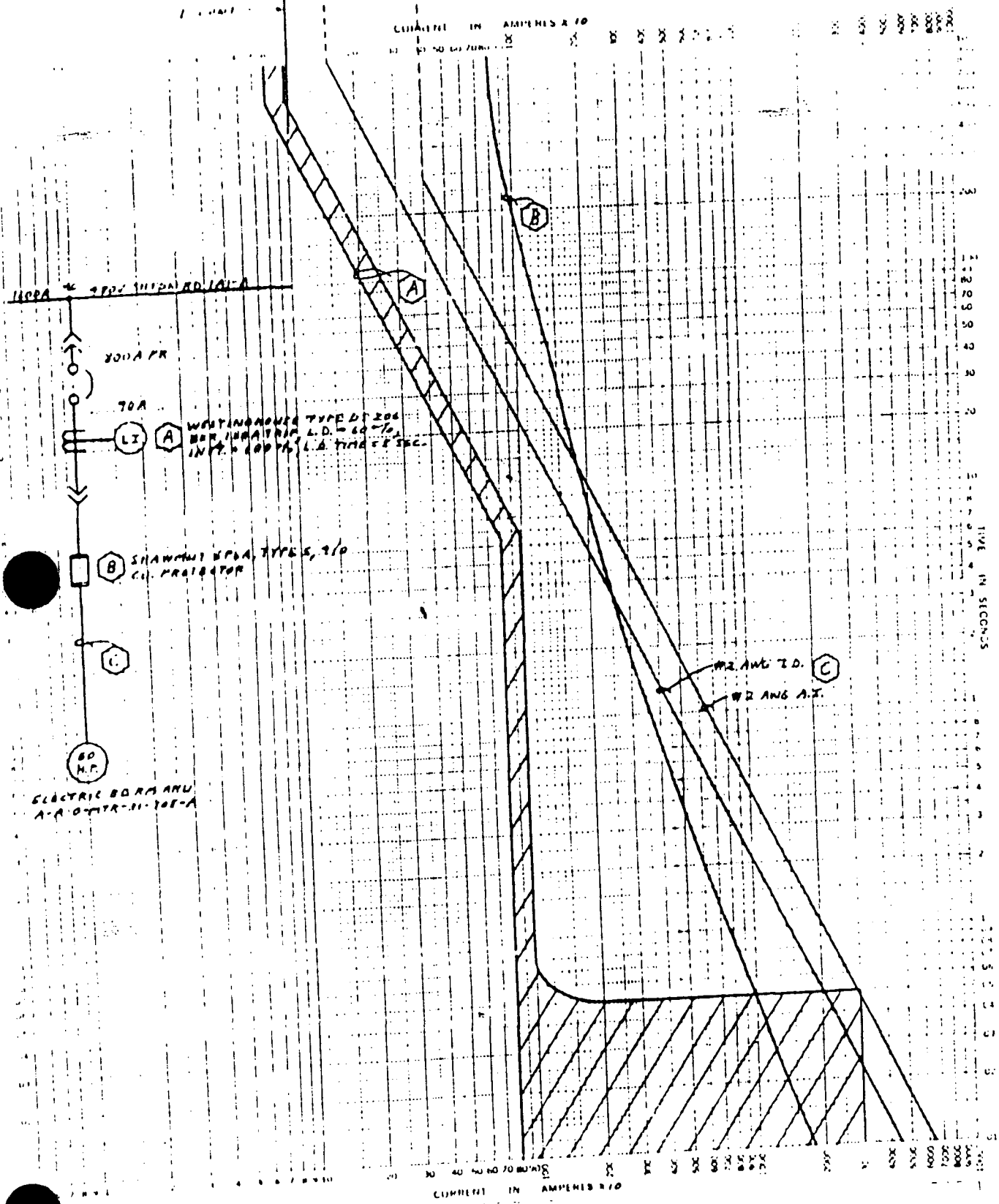
CHECKED EJJ DATE 4/16/91

IC-4

IC-E COMPUTED TMB DATE 11-14-83

Prepared [illegible] Date 2/2/90

Verified [illegible] Date 2/2/90



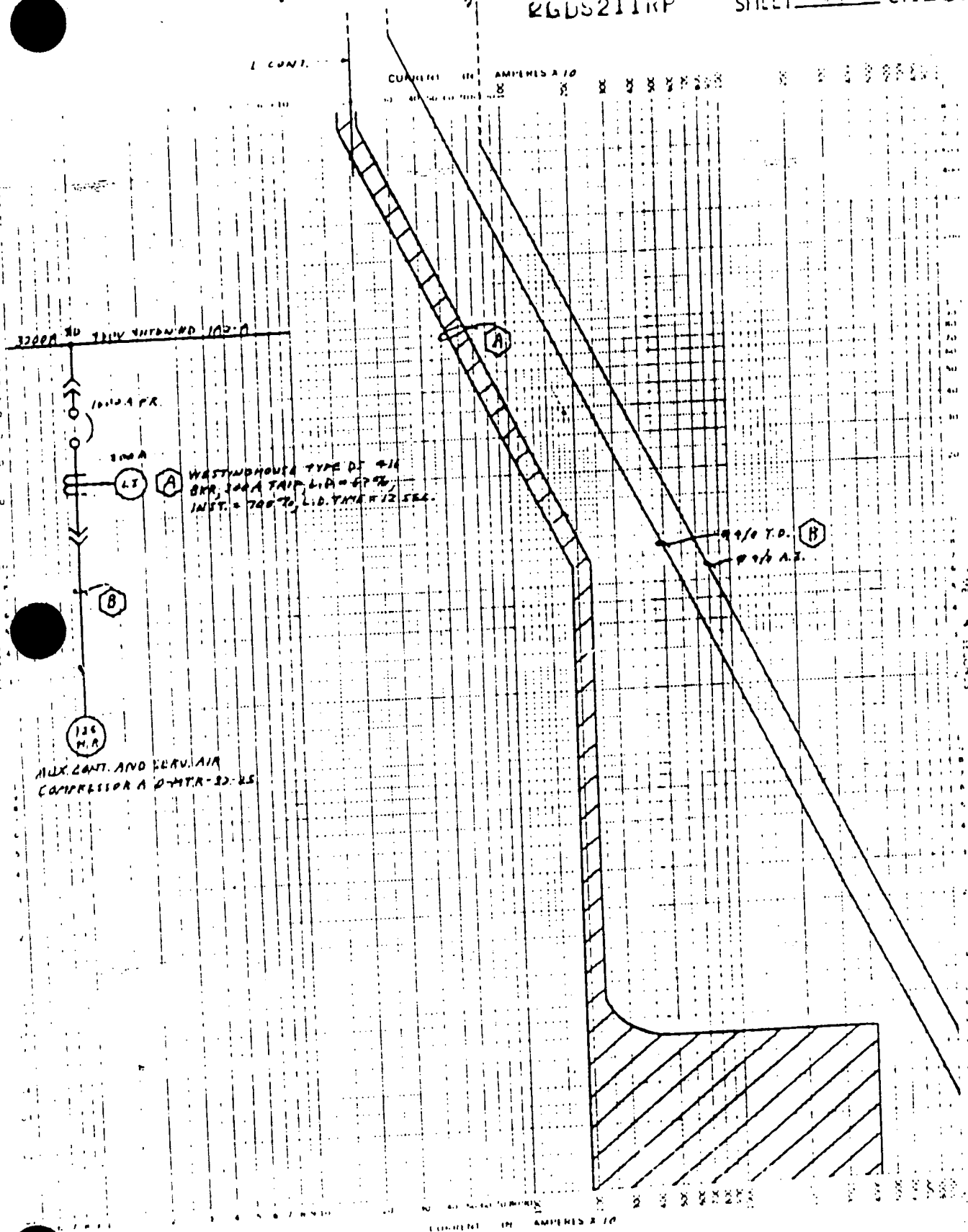
TIME CURRENT CHARACTERISTIC CURVES

Prepared EAB Date 2/2/90

Verified [illegible] Date 2/2/90

COMPUTED ___ DATE ___

RGDS211RP SHEET ___ OF ~~11~~ 2/2/90



RGDS211RP

WATTS BAR ASSOCIATED CIRCUITS ANALYSIS

TIME CURRENT CHARACTERISTIC CURVES

Time in TRUV BASE

COMPUTED ___ DATE ___

TC-7

Prepared [signature] Date 2/2/90

Verified [signature] Date 2/2/90

WBN EEB-MS-TI13-0011-R0

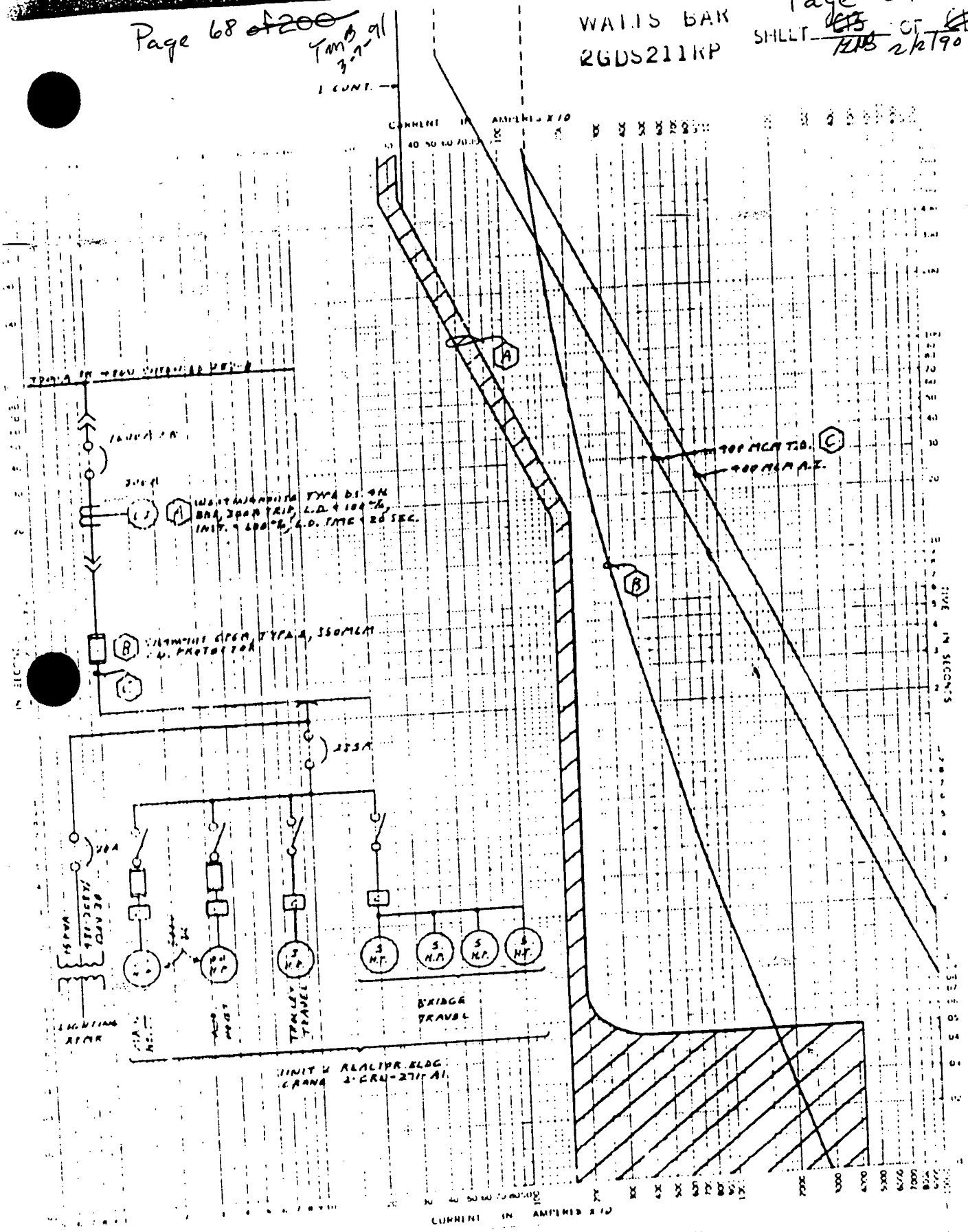
Page C4 of C27

Page 68 ~~of 200~~

WATTS BAR

SHEET ~~DES~~ TI13 OF ~~DES~~ 2 & 90

2GDS211KP



TIME CURRENT CHARACTERISTIC CURVES

TC-13

COMPUTED ___ DATE ___

CHECKED MC DATE 12-1-89

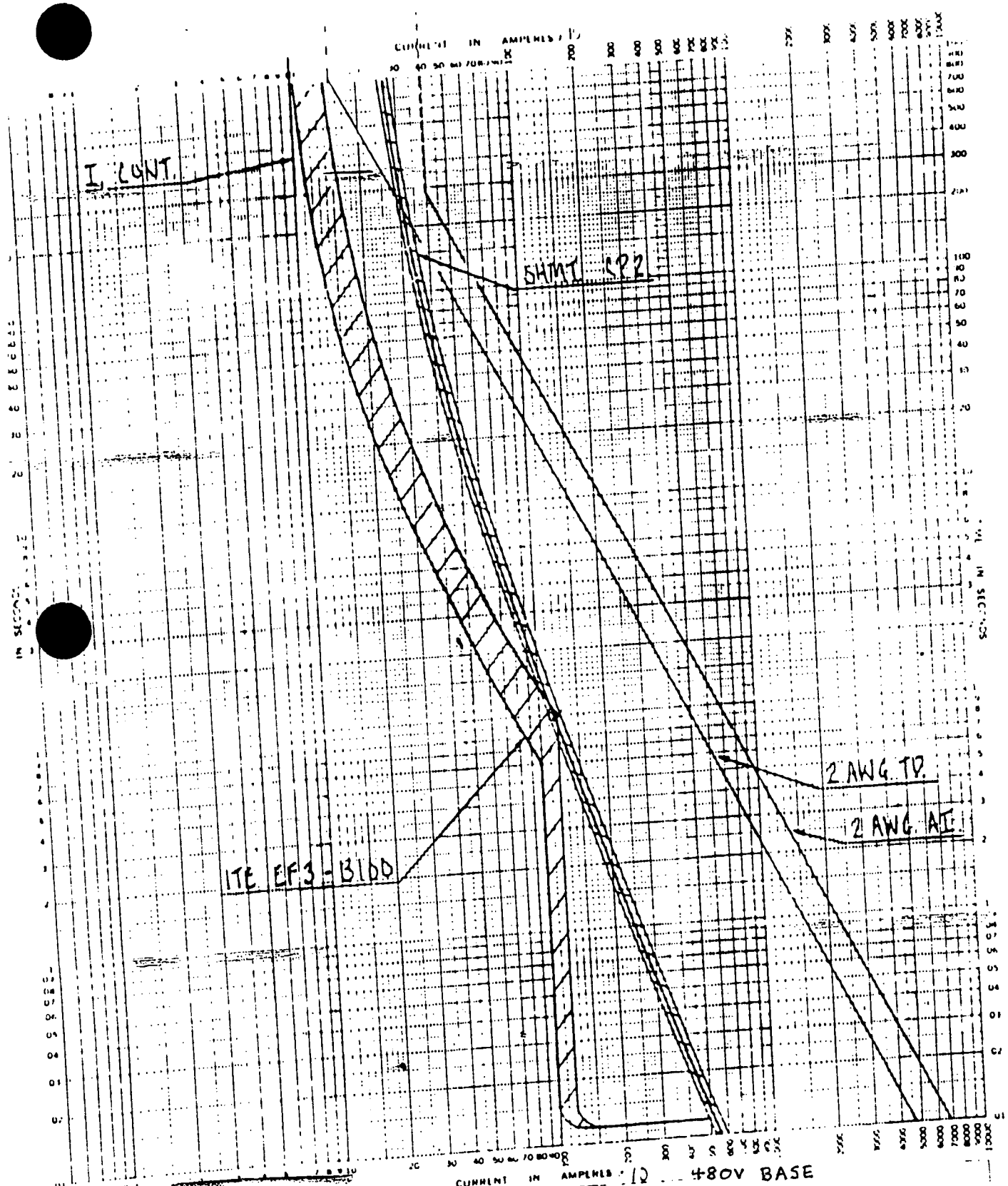
Prepared HH Date 2/2/90

Verified [illegible] Date 2/2/90

3-7-91 (illegible)

2CDS211NP

SHEET [illegible] 2/2/90



RII

RII COMPUTED TmB DATE 3-7-91

CHECKED EJJ DATE 4/16/91

TIME CURRENT CHARACTERISTIC CURVES

480V BASE

TC-17

COMPUTED LAH DATE 11-14-83

CHECKED [illegible] DATE 11-22-83

Prepared HA Date 2/2/90

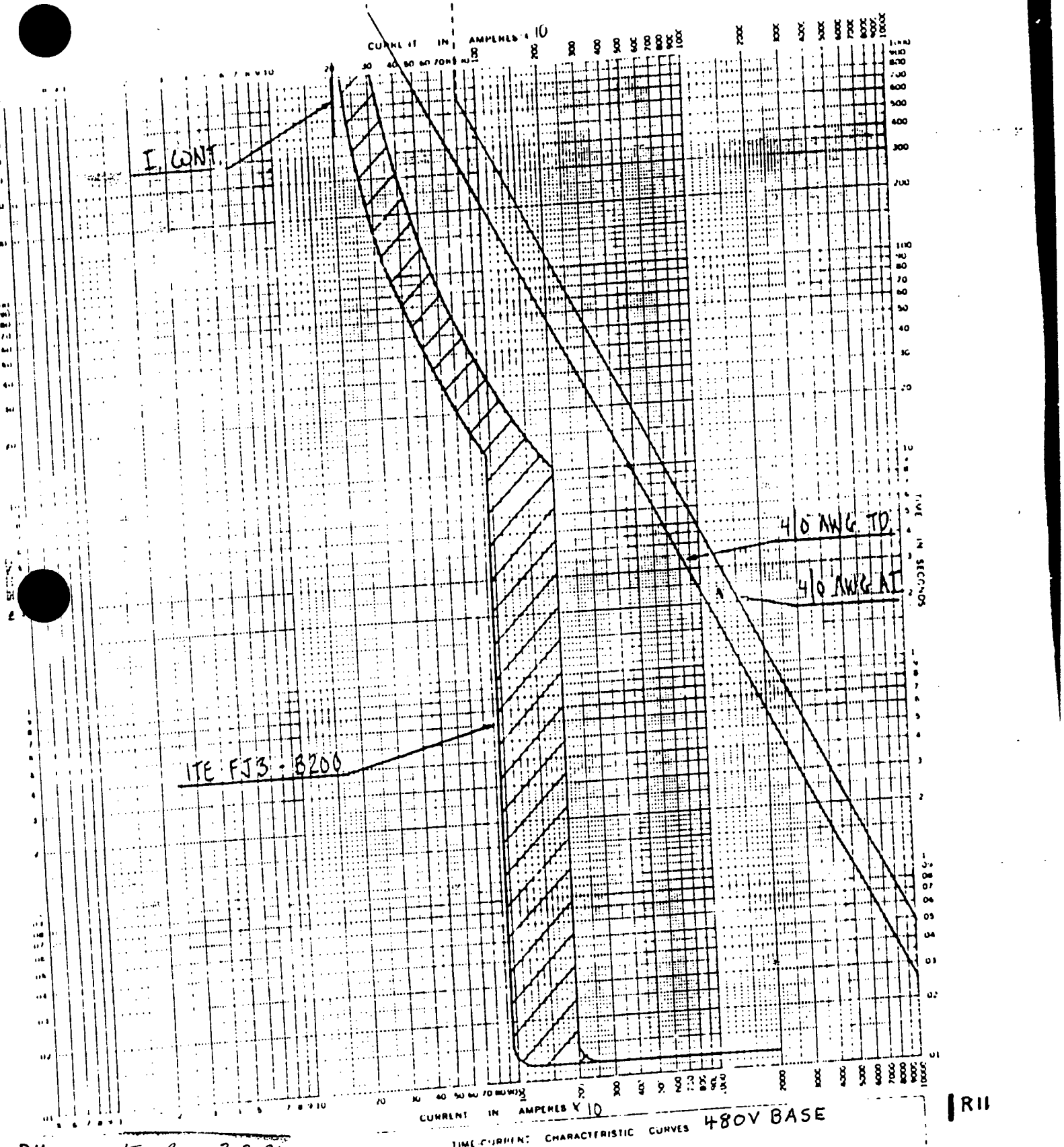
Verified JMZ Date 2/2/90

Page 70 ~~of 200~~ TMB 3-2-91

WATTS BAR

SHEET ~~C5~~ ~~EMB 2/2/90~~

26DS211AP



RII

TIME-CURRENT CHARACTERISTIC CURVES 480V BASE

Fuse Links In

Dated

p.f. starting at 75C with no initial load

No TC-27

Date

RII COMPUTED TMB DATE 3-2-91

CHECKED EJJ DATE 4/16/91

Prepared ~~JHA~~ Date 2/2/90

Verified JHA Date 2/2/90

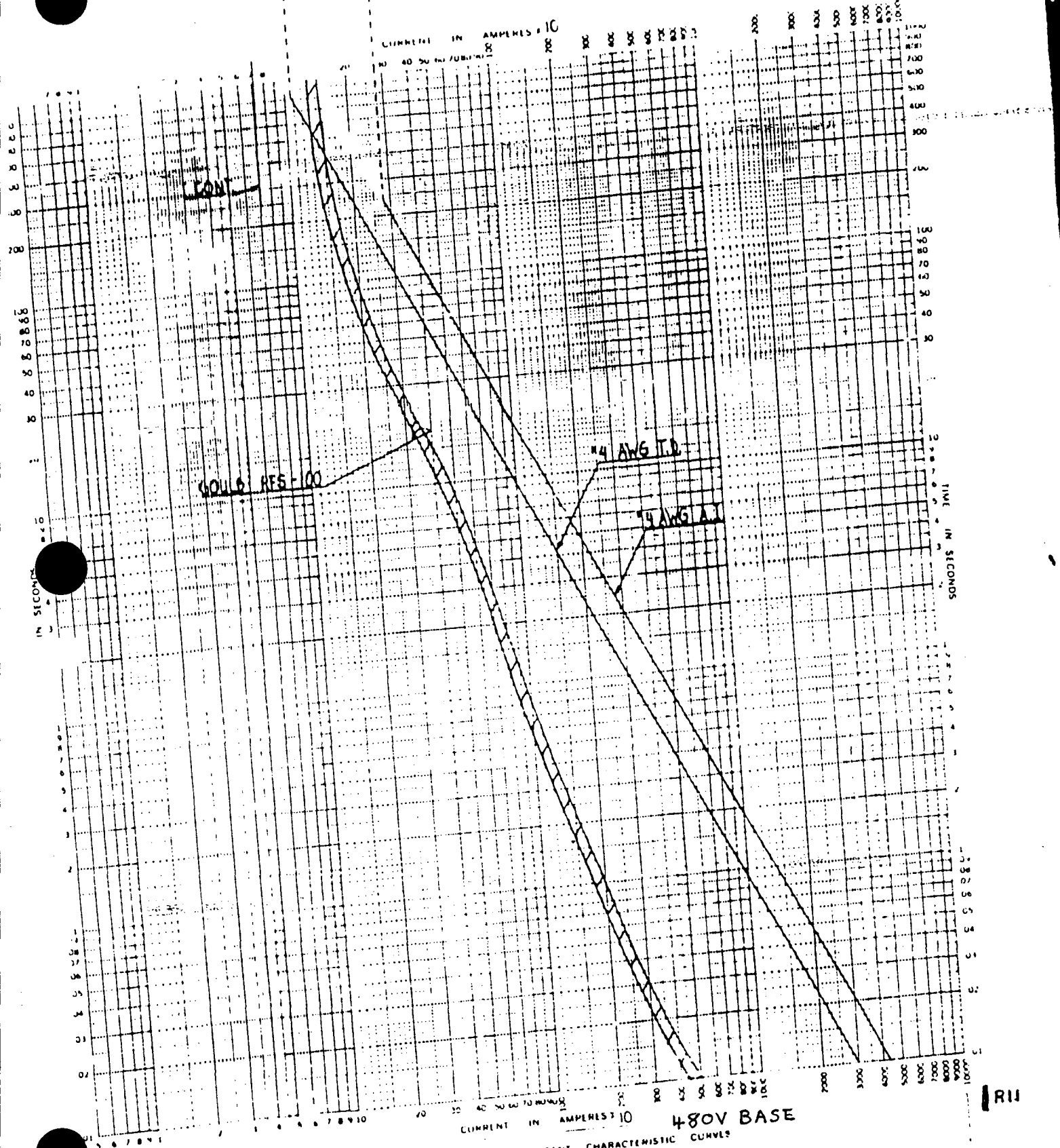
COMPUTED LNH DATE 11-14-83

CHECKED MJC DATE 11-14-83

WATTS BAR

RGDS211NP

~~CHB~~ CHB 2/2/90



TIME-CURRENT CHARACTERISTIC CURVES

Fuse Links: In

Dated

p.f. starting at 25C with no initial load

Volts a.c. at

Test points on curve/curves should be

No. TC-30

Date

COMPUTED TMB DATE 3-7-91

CHECKED EJJ DATE 4/16/91

ASIS FOR DATE standards

1 Tests made at

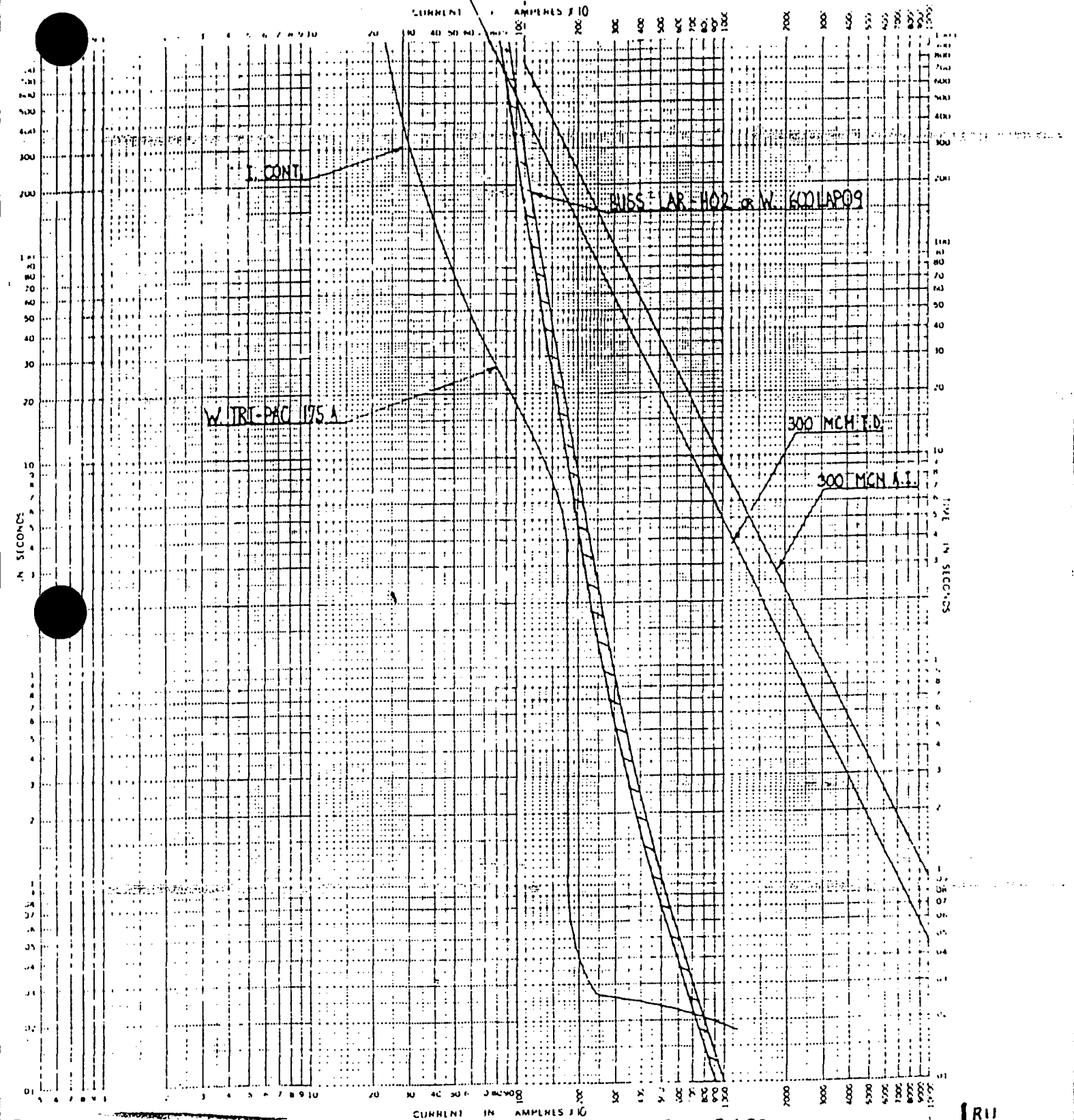
2 Curves adjusted to

COMPUTED JNH DATE 11-14-83

Prepared HH Date 2/2/90

Verified JMS Date 2/2/90

WATTS BAR
2GDS211AP



480V BASE

TIME-CURRENT CHARACTERISTIC CURVES

Fuse Links In

Dated

p.f. starting at 25C with no initial load

Test points no variations should be

No TC-33

Date

R11

COMPUTED TMB DATE 3-7-91

CHECKED EH DATE 4/16/91

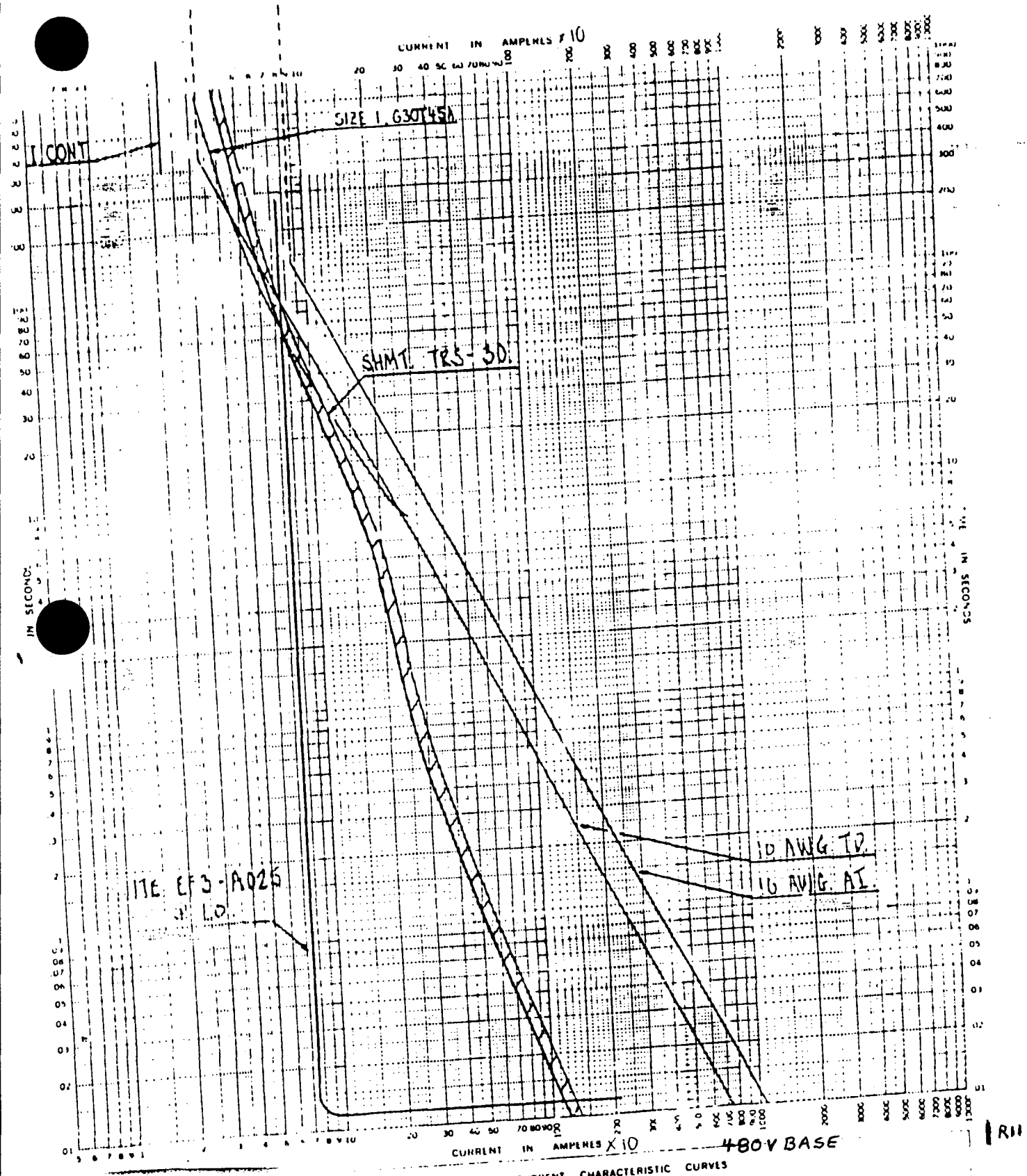
Volts a-c at

COMPUTED LAH DATE 11-14-83

CHECKED MHC DATE 11-15-83

PREPARED HA DATE 2/2/90

VERIFIED JMT DATE 2/2/90



TIME-CURRENT CHARACTERISTIC CURVES

Fuse Links. In

Dated

p.f. starting at 25C with no initial load

No TC-38

Date

Tests made at

Curves are plotted from

Tests made at

Test points on curves should be

COMPUTED LAH DATE 11-14-83

CHECKED [illegible] DATE 11-25-83

Prepared HA Date 2/2/90

Verified [signature] Date 2/2/90

RII

RII

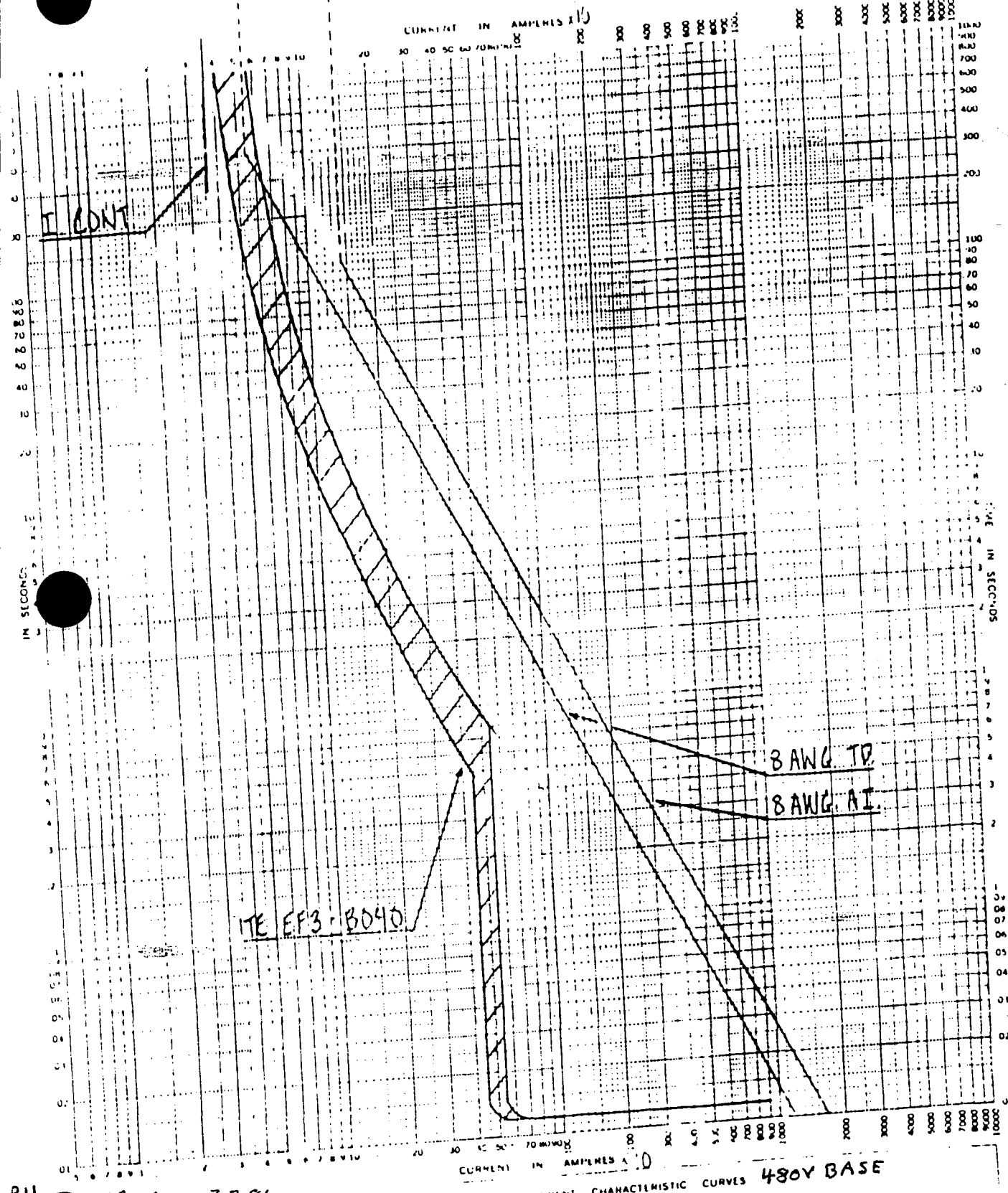
SUBMITTED TMB DATE 3-7-91

For EBB 4/16/91

STS FOR [illegible] DATE [illegible]

K-E

2GD-211NP



RII

TIME CURRENT CHARACTERISTIC CURVES 480V BASE

Fuse Links in

Dated

at starting at 25C with no initial load

No TC-39

Date

RII

YmB DATE 3-7-91

EJJ DATE 4/16/91

SIS FUN DATA Standards

Tests made at

Volts a.c. at

COMPUTED LNH DATE 11-14-83

CHECKED ~~JAC~~ DATE 11-15-83

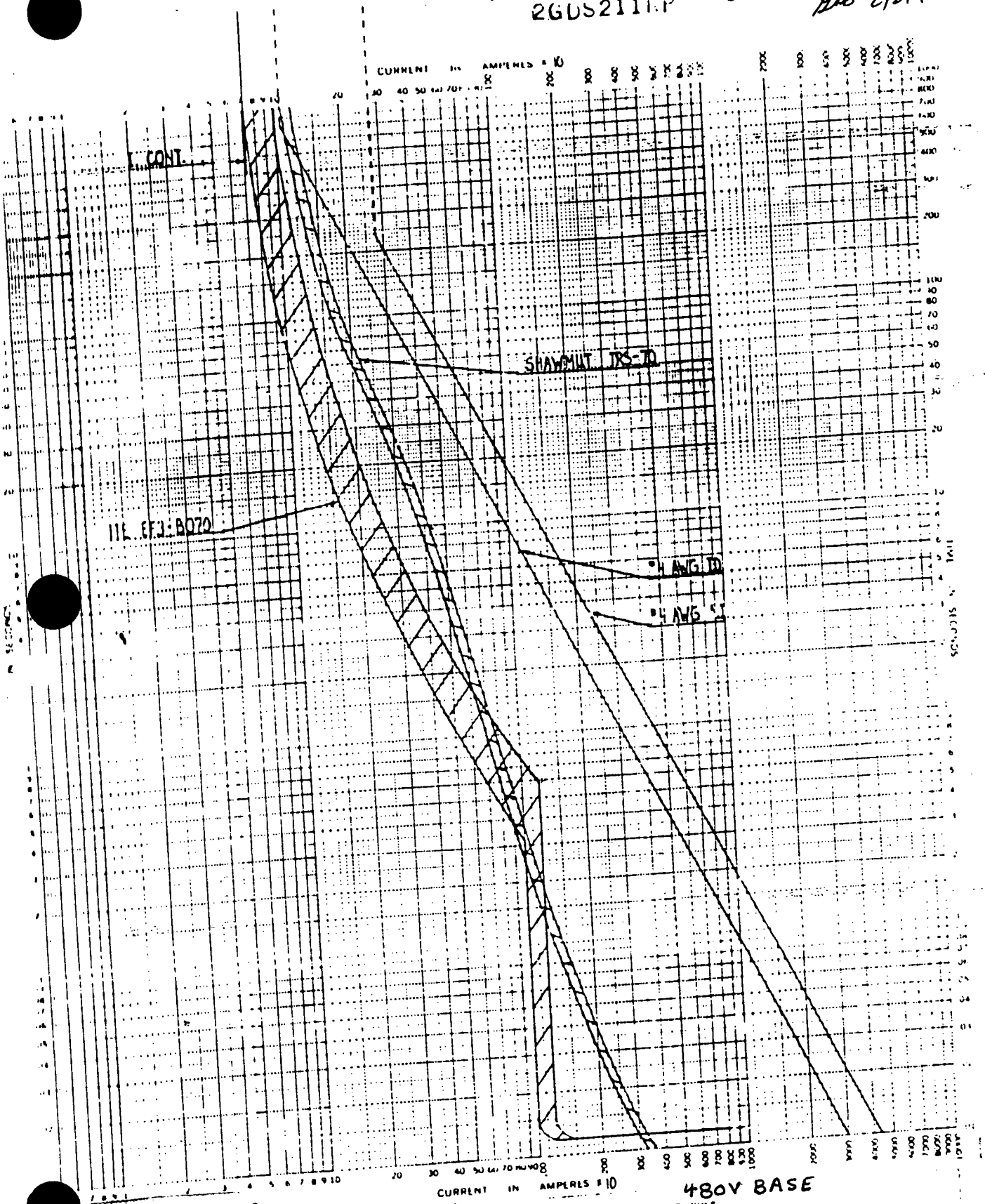
Prepared HA Date 4/4/90

Verified YmB Date 2/2/90

WATTS BAR

2GDS211AP

SHEET ~~500~~ 211 ~~235~~ 2/2/90



TIME-CURRENT CHARACTERISTIC CURVES

Fuse Links In

Dated

D.T. starting at 25C with no initial load

Test points on variations should be

Volts a c at

Tests made at

Curves are plotted to

BASIS FOR DATA Standards

CONTROLLED TMB DATE 3-7-91

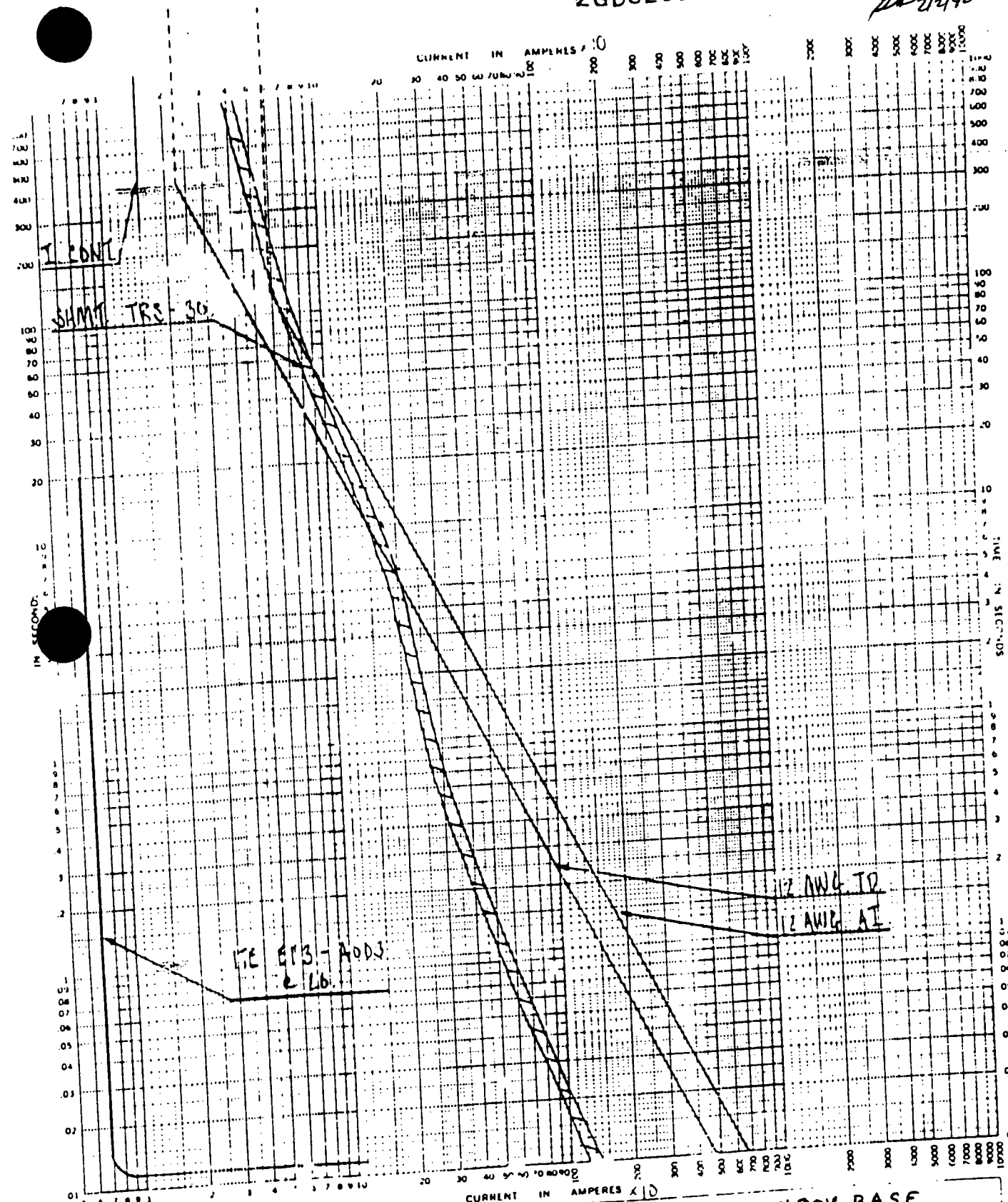
CHECKED EJ DATE 4/16/91

No TC-56

Date

Prepared HA Date 2/2/90

Verified JMT Date 2/2/90



TIME-CURRENT CHARACTERISTIC CURVES 480V BASE

Fuse Links In

Dated

p.f. starting at 25C with no initial load

Volts a.c. at

Test points and variations shown on

RII

No TC-64

Date

Prepared HA Date 2/1/90

Verified [signature] Date 2/2/90

COMPUTED UW DATE 11-14-83

CHECKED [illegible] DATE [illegible]

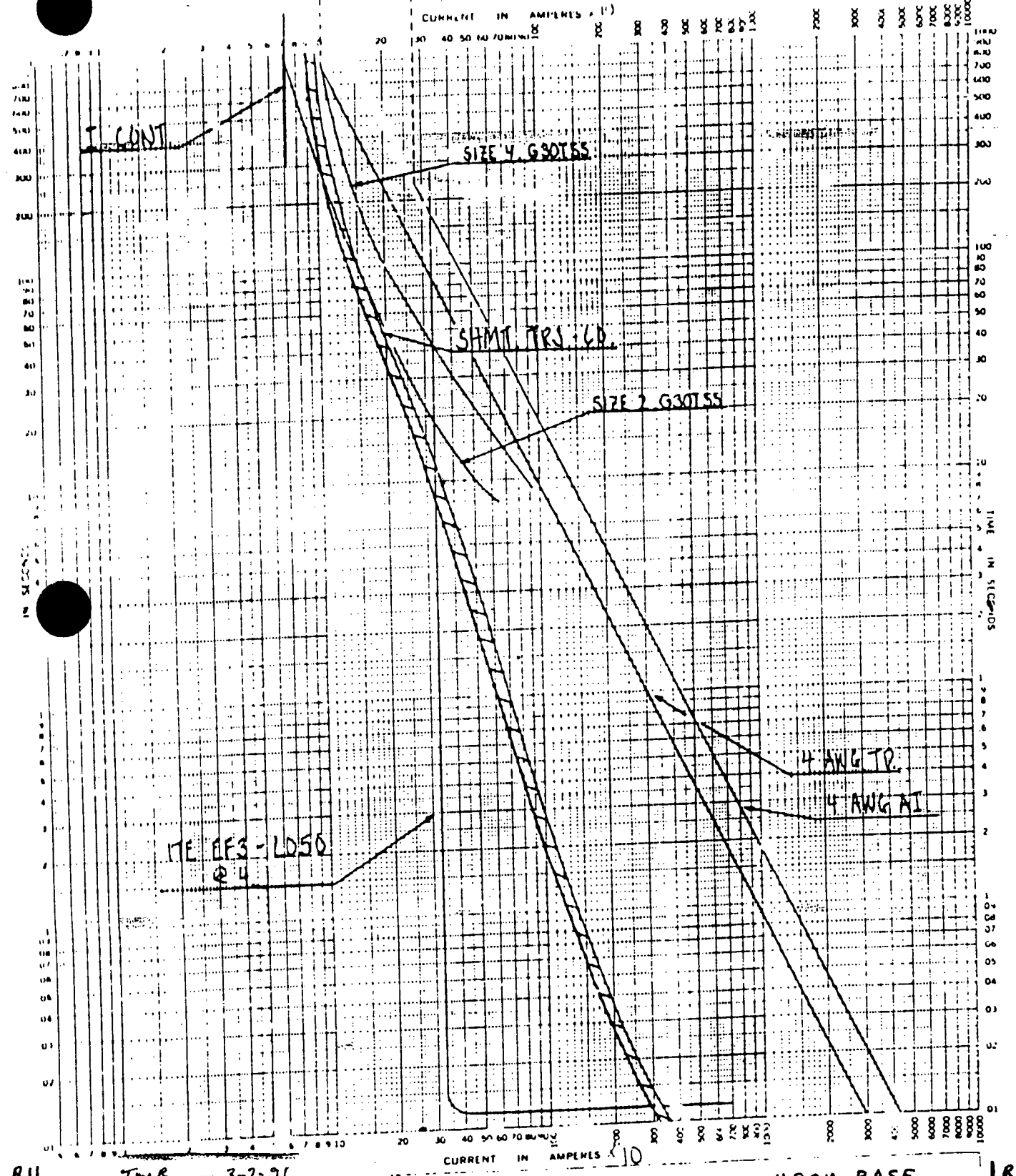
RII

DATE 3-7-91

DATE 4/16/91

SIS FOR DATA Standards

Tests made at



R11 COMPUTED TWB DATE 3-7-91

ED EJJ DATE 4/16/91

TIME-CURRENT CHARACTERISTIC CURVES 480V BASE R11

Fuse Links In

Dated

p.f. starting at 25C with no initial load

Volts a.c. at

Test points are cumulative elapsed time

No TC-67

Date

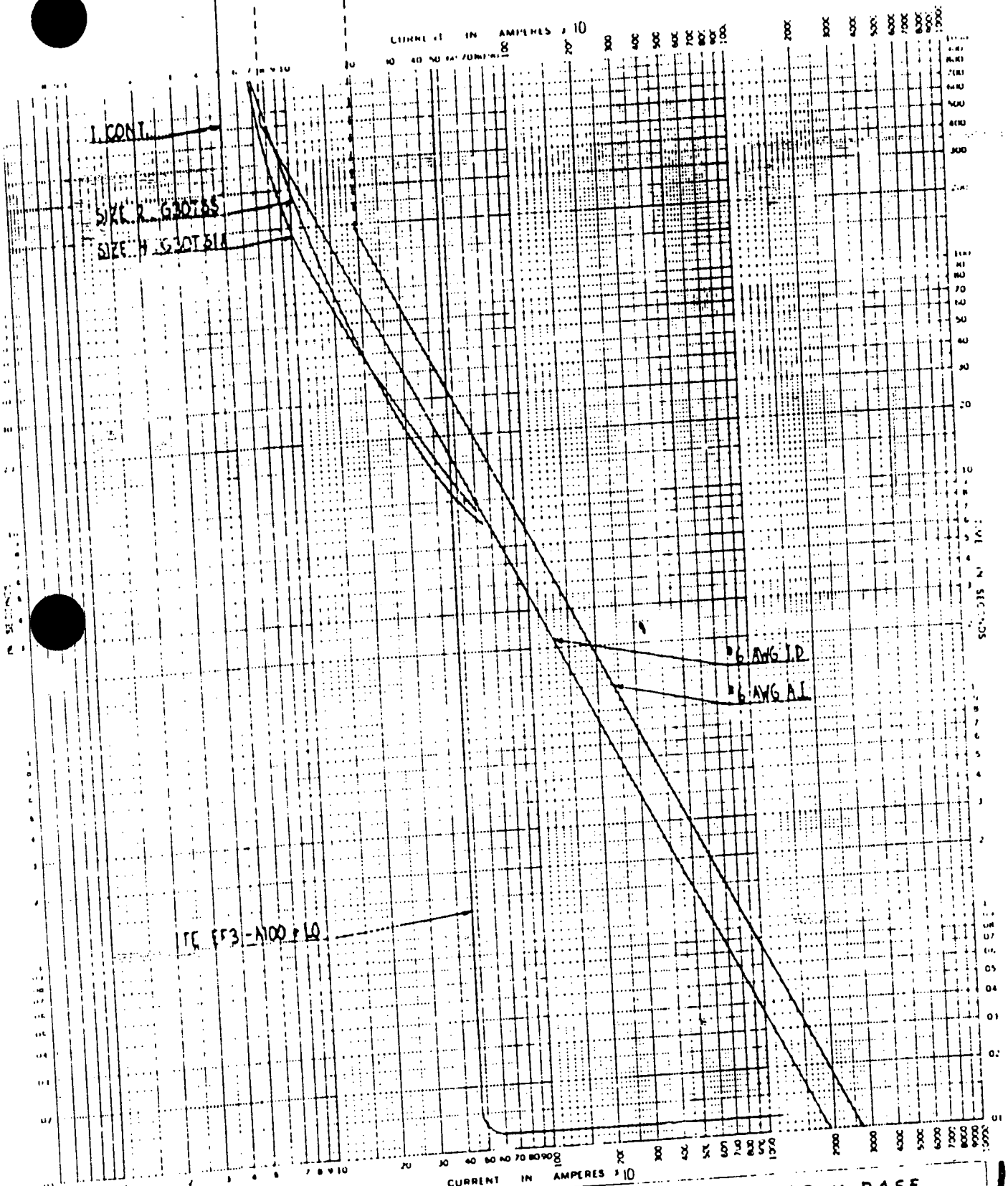
Prepared SJ Date 2-3-90

Verified Ruth for JML Date 2-3-90

COMPUTED LHH DATE 11-14-83

CHECKED [illegible] DATE [illegible]

WATTS BAR
3-2-91 2-US211KP
SHEET 88 OF 215
2/2/90



TIME CURRENT CHARACTERISTIC CURVES
480V BASE
Fuse Links In
Dated
p.f. starting at 25C with no initial load
No TC-68
Date

R11

TED TMB DATE 3-7-91
ED EJF DATE 4/16/91
S FOR DATA Standards

R11

COMPUTED UH DATE 11-28-83
CHECKED DATE 11-28-83

Prepared HA Date 2/2/90
Verified JMY Date 2/2/90

WBN EEB-MS-TI15-0011 RO

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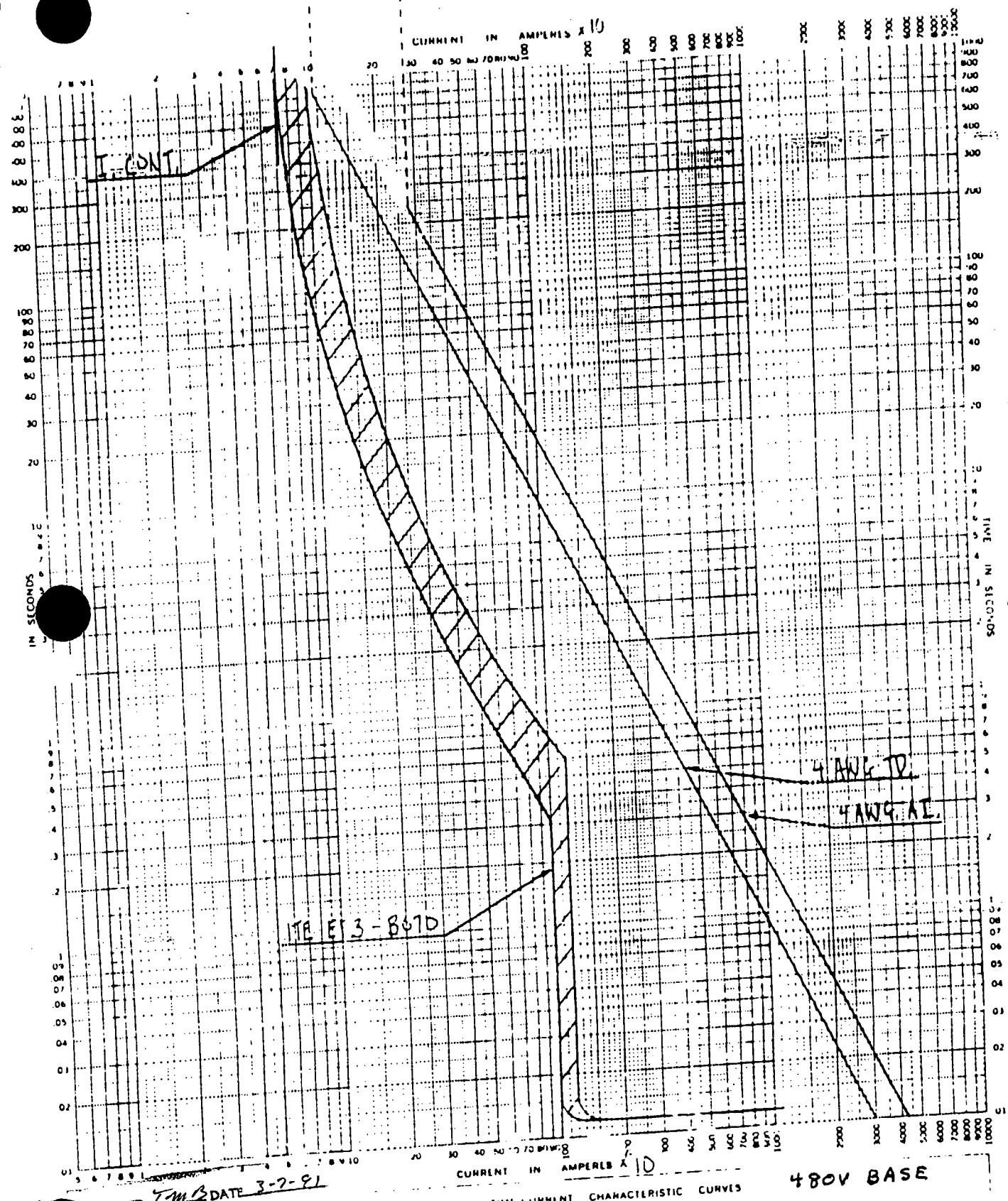
Page C27



480V BASE

TIME-CURRENT CHARACTERISTIC CURVES

Fuse Links In

Dated

p.f. starting at 25C with no initial load

Volts a.c. or

Test points at variations should be

TC-70

Date

COMPUTED TMB DATE 3-7-91

CHECKED EJJ DATE 4/16/91

BASIS FOR DATA Standards

1 Tests made at

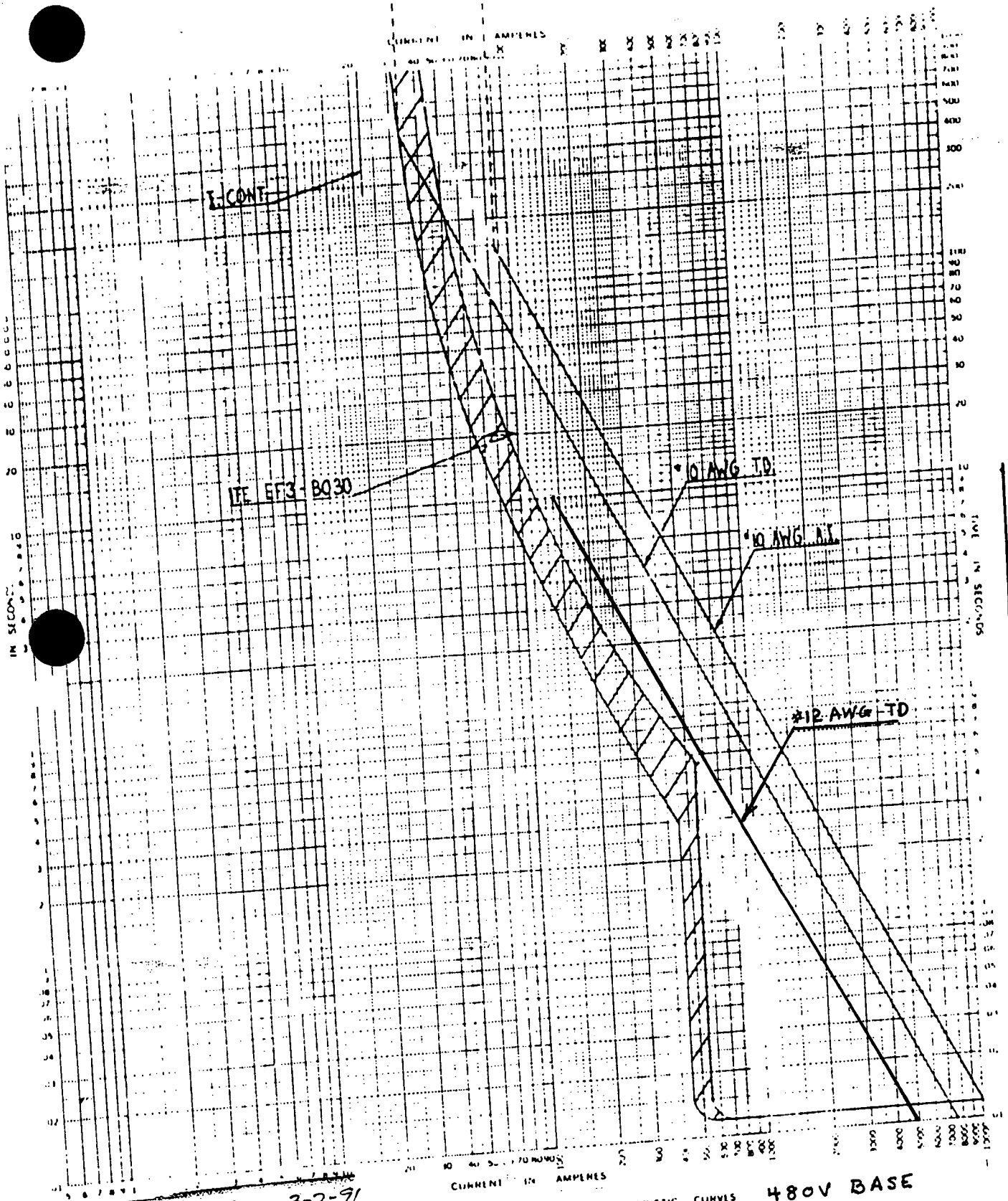
2 Curves are adjusted to

COMPUTED LAH DATE 11-14-83

CHECKED DATE

Prepared LA Date 2/2/90

Verified Jm Z Date 2/2/90



TIME CURRENT CHARACTERISTIC CURVES 480V BASE

No TC-77

Date

Fuse Links In

Data!

P.F. starting at 25C with no initial load

Tests made at

Volts a.c. at

Test points are connected shown like

RII

COMPUTED TMS DATE 3-7-91

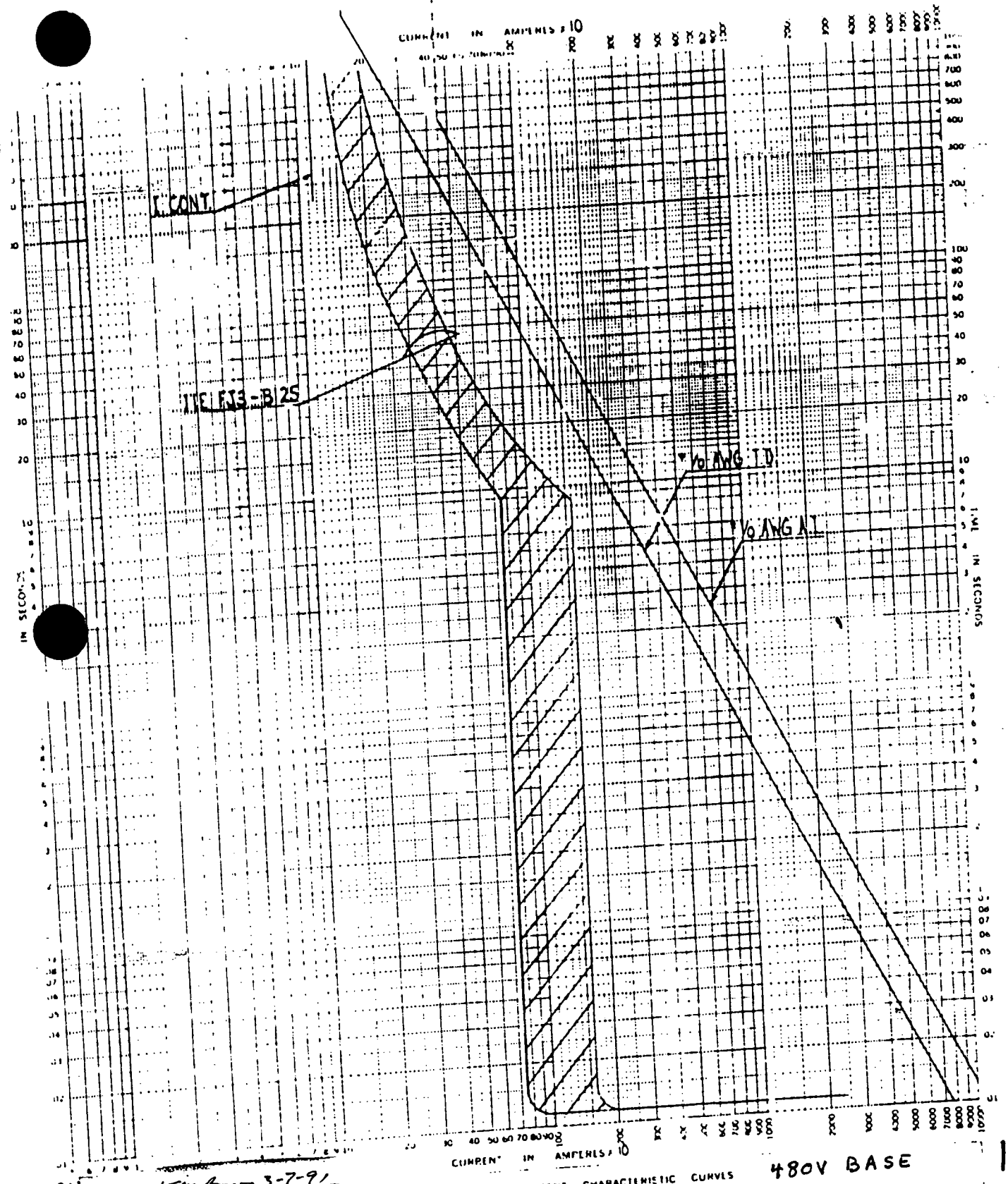
CHECKED EH DATE 4/16/91

Prepared [signature] Date 2/2/90

Verified [signature] Date 2/2/90

COMPUTED LNH DATE 11-14-83

CHECKED [signature] DATE 11-14-83



R11

COMPUTED TMB DATE 3-7-91

CHECKED EJF DATE 4/16/91

TIME-CURRENT CHARACTERISTIC CURVES

480V BASE

R11

Fuse Links. In

Dated

p.f. starting at 25C with no initial load

No TC-80

Date

Volts a.c. at

Test points on curve shown like

Tests made at

Basis for Data Standards

COMPUTED LNH DATE 11-19-83

CHECKED [illegible] DATE 11-17-[illegible]

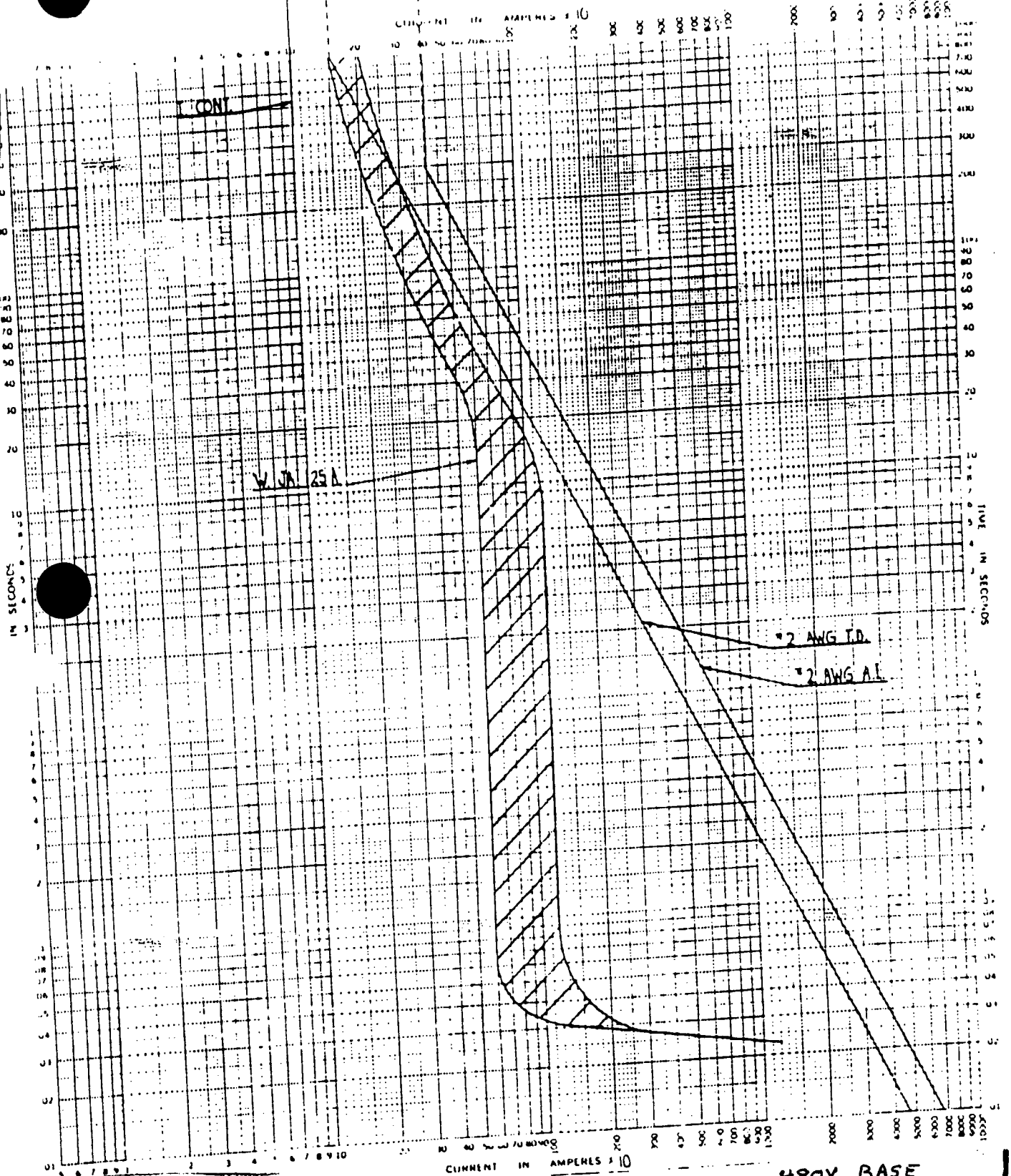
Prepared JA Date 2/2/90

Verified JMB Date 2/2/90

WATTS BAR

2GDS211NP

SHEET ~~C102 R1B~~ 2/3/90 ~~1-15~~ C



480V BASE

R11

TIME CURRENT CHARACTERISTIC CURVES

Fuse Links In

Dated

D.F. starting at 25C with no initial load

Volts a.c. at

Test points on variations should be

No TC-83

Date

SIS FOR DATA Standards

Tests made at

Curves are plotted for

COMPUTED LNI DATE 11-24-83

CHECKED [illegible] DATE 11-26-83

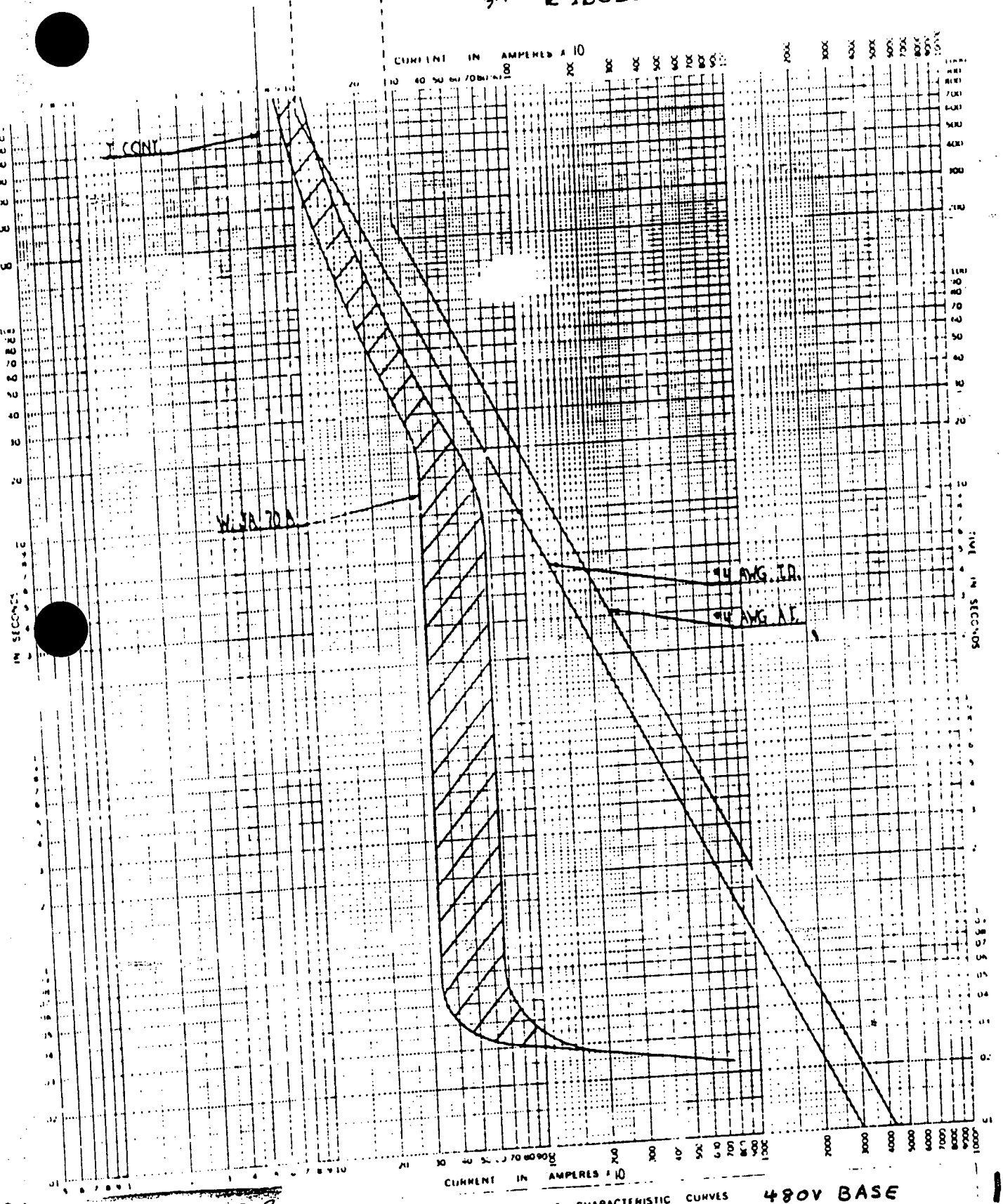
Prepared HA Date 2/2/90

Verified [signature] Date 2/2/90

R11

COMPUTED [illegible] DATE 3-7-91

CHECKED EEB DATE 4/16/91



TIME-CURRENT CHARACTERISTIC CURVES 480V BASE

Fuse Links. In

Dated

p.f. starting at 25C with no initial load

Volts a.c. at

Test points on curve have no allowable stimulation

No TC-8H

Date

SIS FOR DATA Standards

Tests made at

Curves are plotted

COMPUTED LNH DATE 11-24-83

CHECKED DLC DATE 11-26-83

Prepared [illegible] Date 2/2/90

Verified [illegible] Date 2/2/90

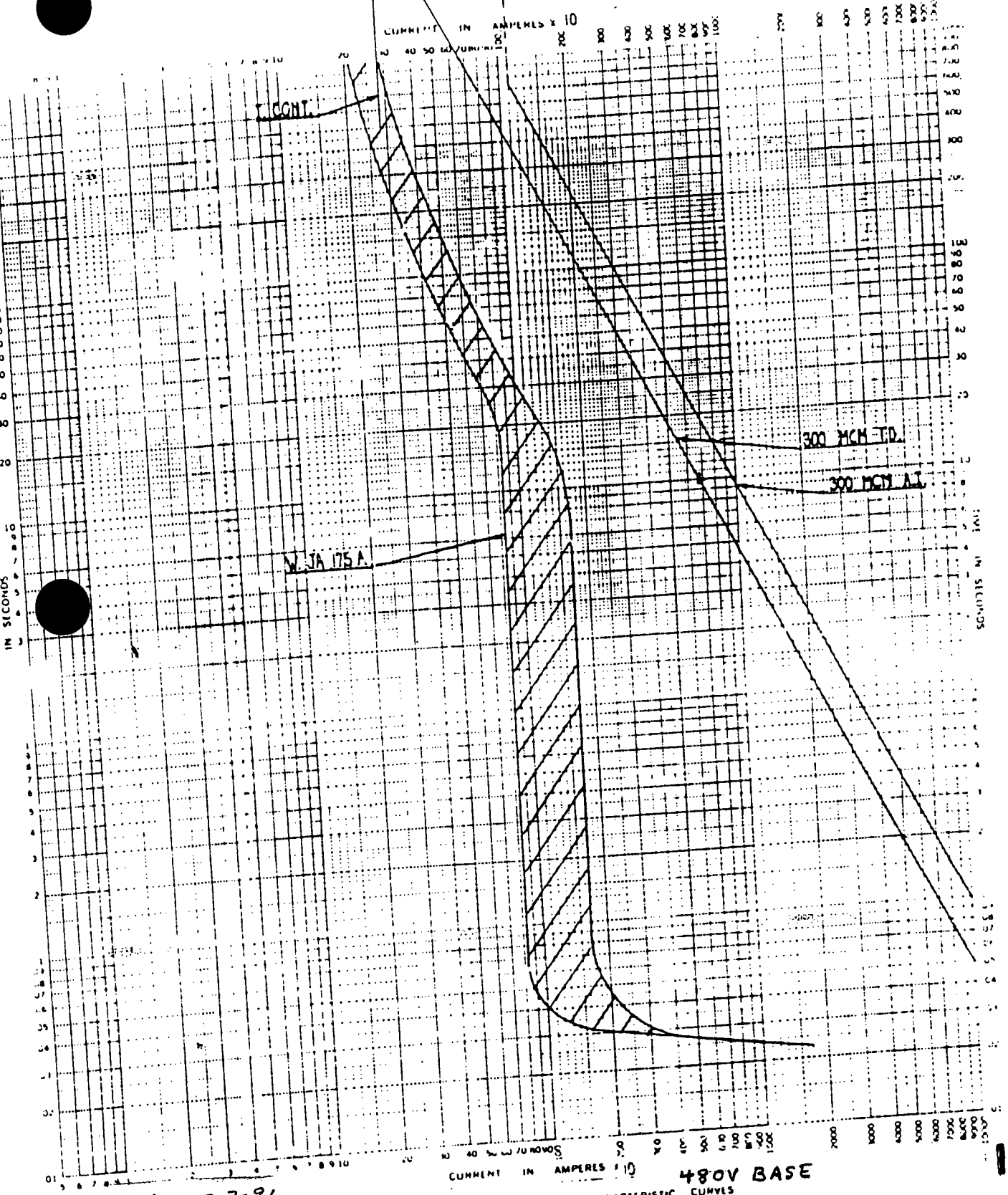
R11

CHECKED TMB DATE 3-2-91

CHECKED EJJ DATE 4/10/91

R11

gmb 3-7-91



R11

TIME CURRENT CHARACTERISTIC CURVES

Fuse Links In

Dated

pf starting at 25C with no initial load

Volts a.c. or

Test points are terminals unless shown

No TC-86

Date

Prepared HA Date 2/2/90

Verified Jam Date 2/2/90

COMPUTED LMI DATE 11-24-83

CHECKED DMC DATE 11-26-83

R11

CO gmb DATE 3-7-91

CHE EW DATE 4/16/91

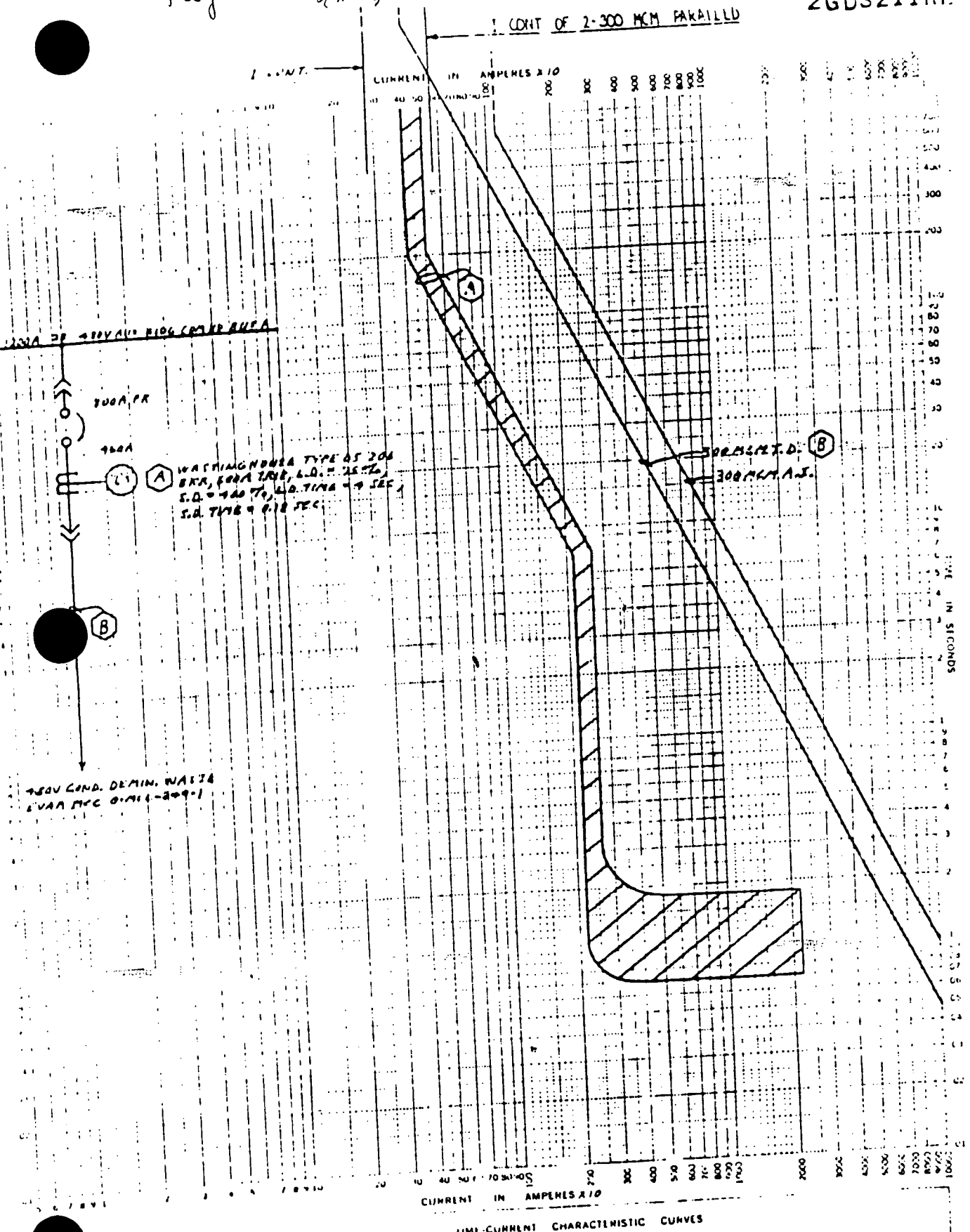
SIS FOR DATE Standards

Tests made at

Fuses are plug

4th Point

K-E



2GDS211RP

WATTS BAR ASSOCIATED CIRCUITS ANALYSIS

TIME-CURRENT CHARACTERISTIC CURVES

Fuse Links in 480V BASE

Dated

p.f. starting at 75°C with no initial load

No TC-89

Date

COMPUTED [illegible] DATE [illegible]

CHECKED MLC DATE 12-1-89

Prepared [signature] Date 2/2/90

Verified [signature] Date 2/2/90

WBN EEB-MS-TI15-0011 R0

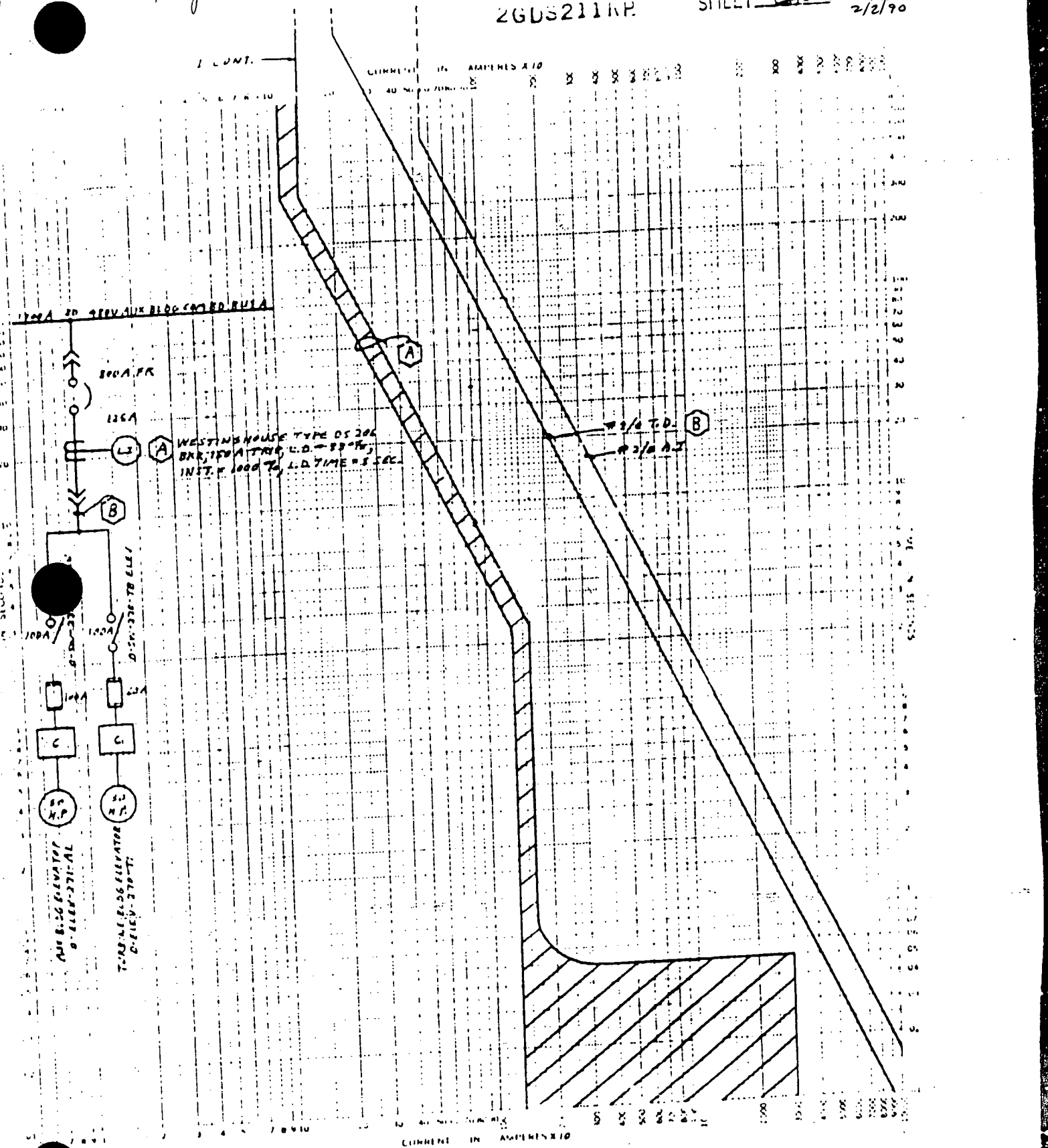
Page 86 ~~of 200~~ FMB 3-7-91

Page C27 22 of C27

WATTS BAR

2GDS211KP

SHEET ~~110~~ MMB 2/2/90 ~~155~~



2GDS211KP

TIME CURRENT CHARACTERISTIC CURVES

WATTS BAR ASSOCIATED CIRCUITS ANALYSIS

TC-91

COMPUTED ___ DATE ___

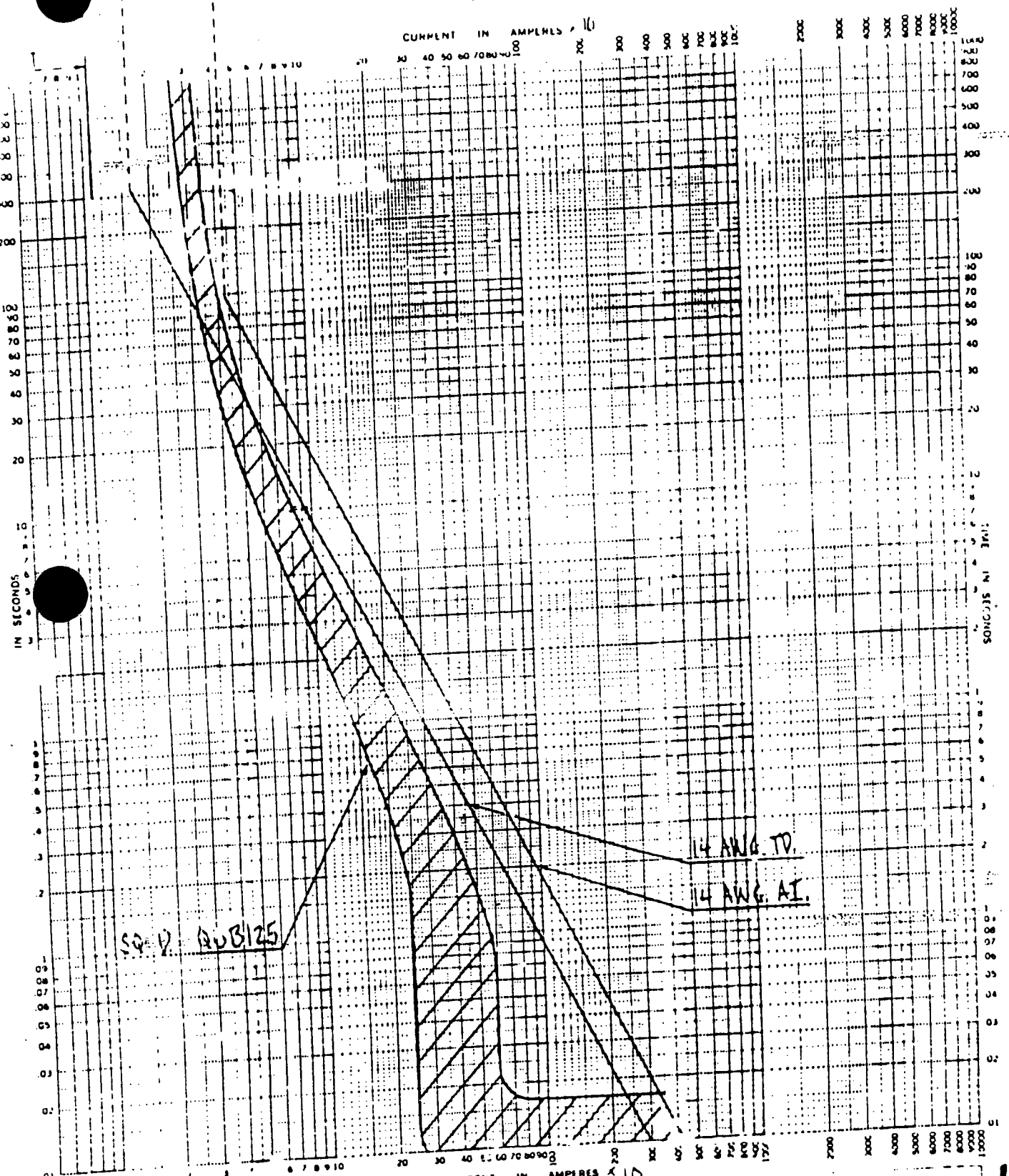
CHECKED MLC DATE 12-1-89

Prepared HA Date 2/2/90

Verified JMZ Date 2/2/90

 WATTS BAR

JILET ~~EE30.MB~~ 2/2/90



480V BASE

TIME-CURRENT CHARACTERISTIC CURVES

Fuse Links. In

Dated

p.f. starting at 25C with no initial load

Volts a.c. of

Test points on variations should be

ASIS FOR DATA Standards

Tests made of

No. TC-109

Date

RII

CO ~~KMB~~ DATE 3-7-91

CHECKED EBJ DATE 4/16/91

Prepared HH Date 2/2/90

Verified JMZ Date 2/2/90

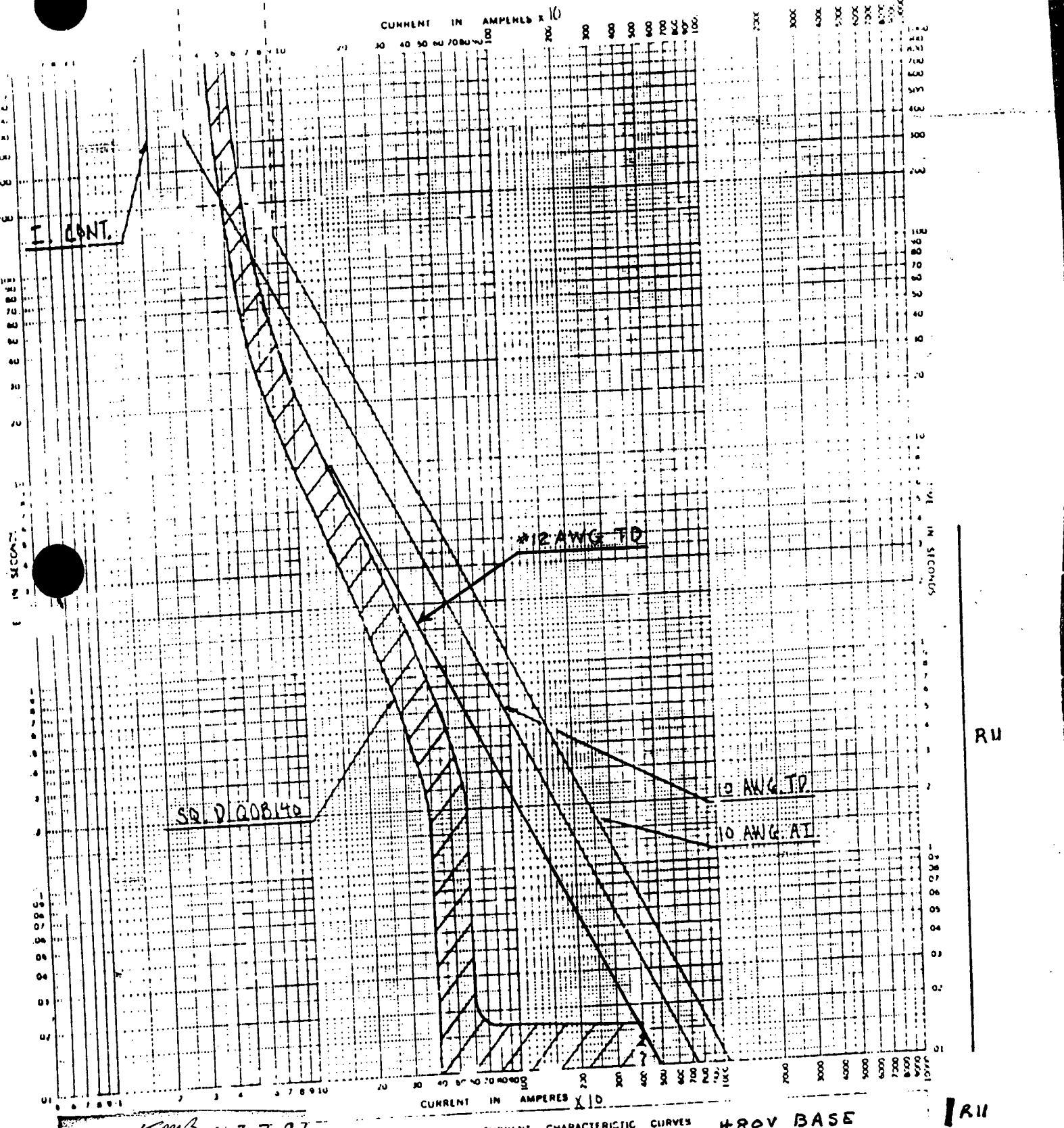
COMPUTED LNH DATE 11-14-83

CHECKED MC DATE 11-26-83

WBN EEB-MS-IIS-0011 R.0

Page 88 ~~of 200~~ WATTS BAR
TMB 3-7-91 2GDS211.RP

Page C24 of C27
SHEET ~~C23~~ 22 OF ~~C115~~ 2/2/90



RU

RII

COMPUTED TMB DATE 3-7-91

CHECKED EJJ DATE 4/16/91

TIME-CURRENT CHARACTERISTIC CURVES 480V BASE

Fuse Links In

Dated

p.f. starting at 25C with no initial load

TC-112

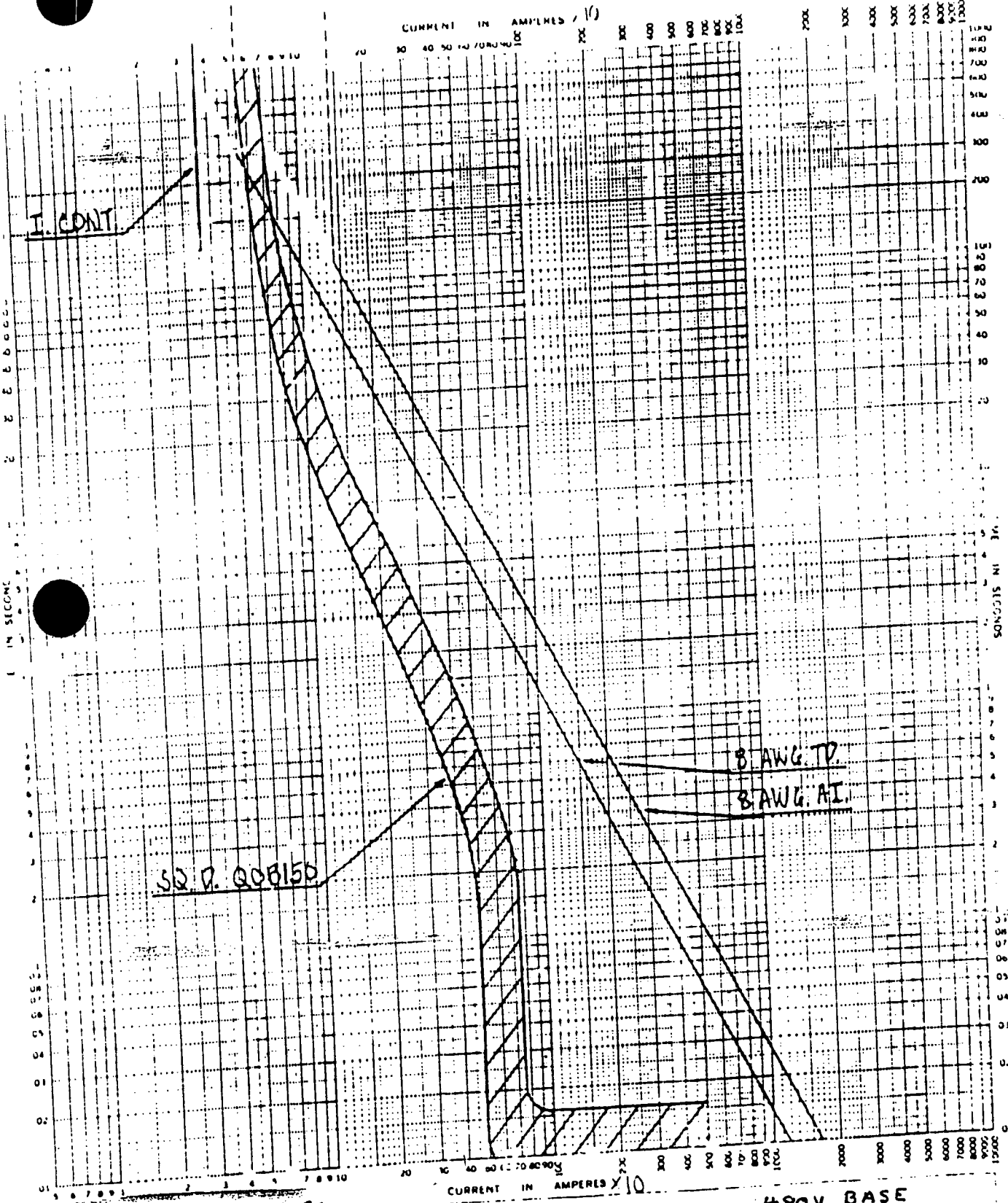
Date

Prepared HA Date 2/2/90

Verified JMZ Date 2/2/90

CHECKED LNH DATE 11-14-83

CHECKED PAC DATE 11-19-83



TIME-CURRENT CHARACTERISTIC CURVES 480V BASE

Fuse Links. In

Dated

p.f. starting at 25C with no initial load

Volts a.c. or

Test points on curve should be

TC-117

No

Date

COMPUTED TMB DATE 3-7-91

CHECKED EEH DATE 4/16/91

IS FOR DATA Standards

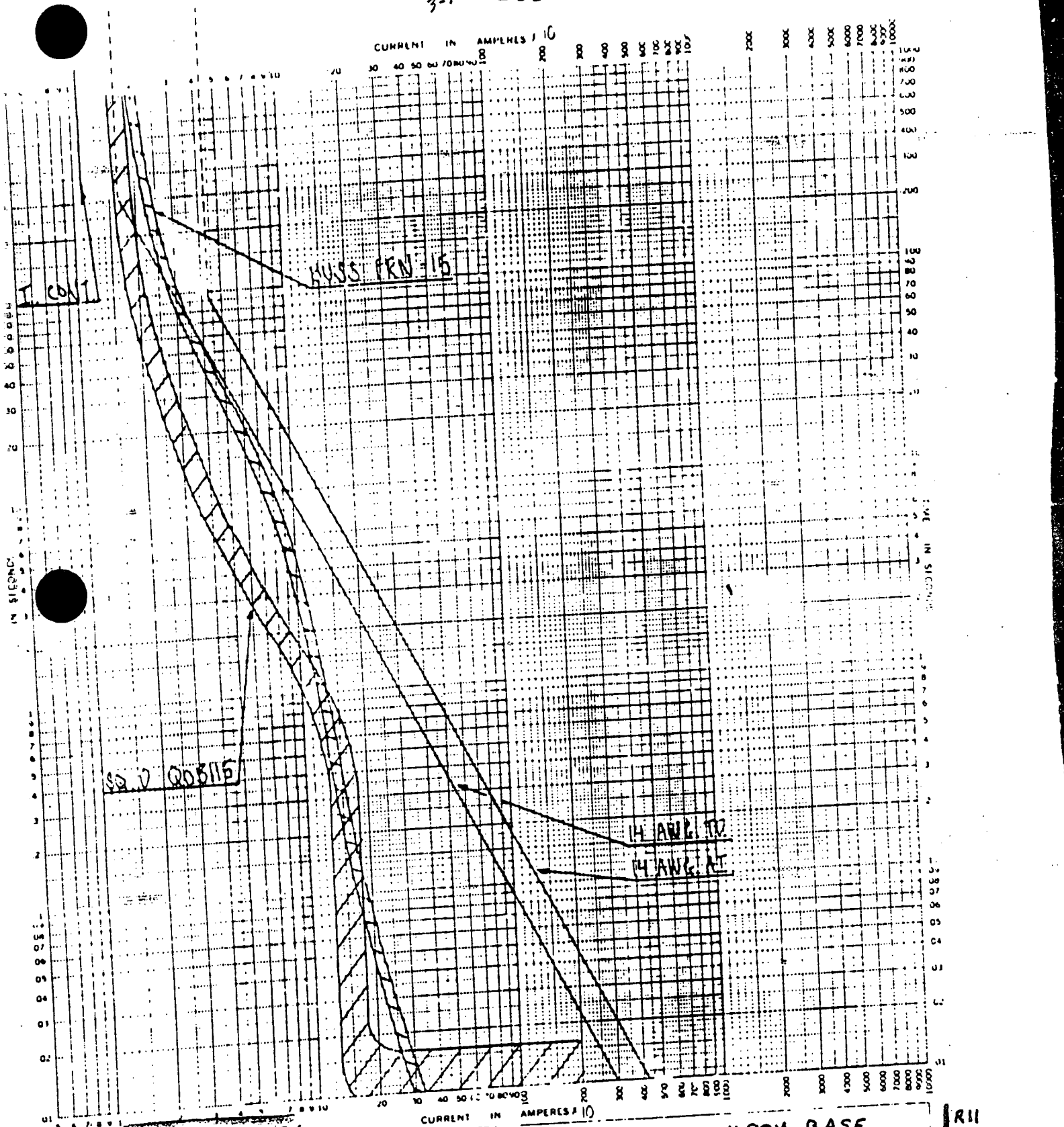
Tests made at

COMPUTED LMH DATE 11-14-83

CHECKED TLC DATE 11-19-83

Prepared HH Date 2/2/90

Verified JMT Date 2/2/90



TIME-CURRENT CHARACTERISTIC CURVES 480V BASE

Fuse Links. In

Dated

p.f. starting at 25C with no initial load

No TC-118

Date

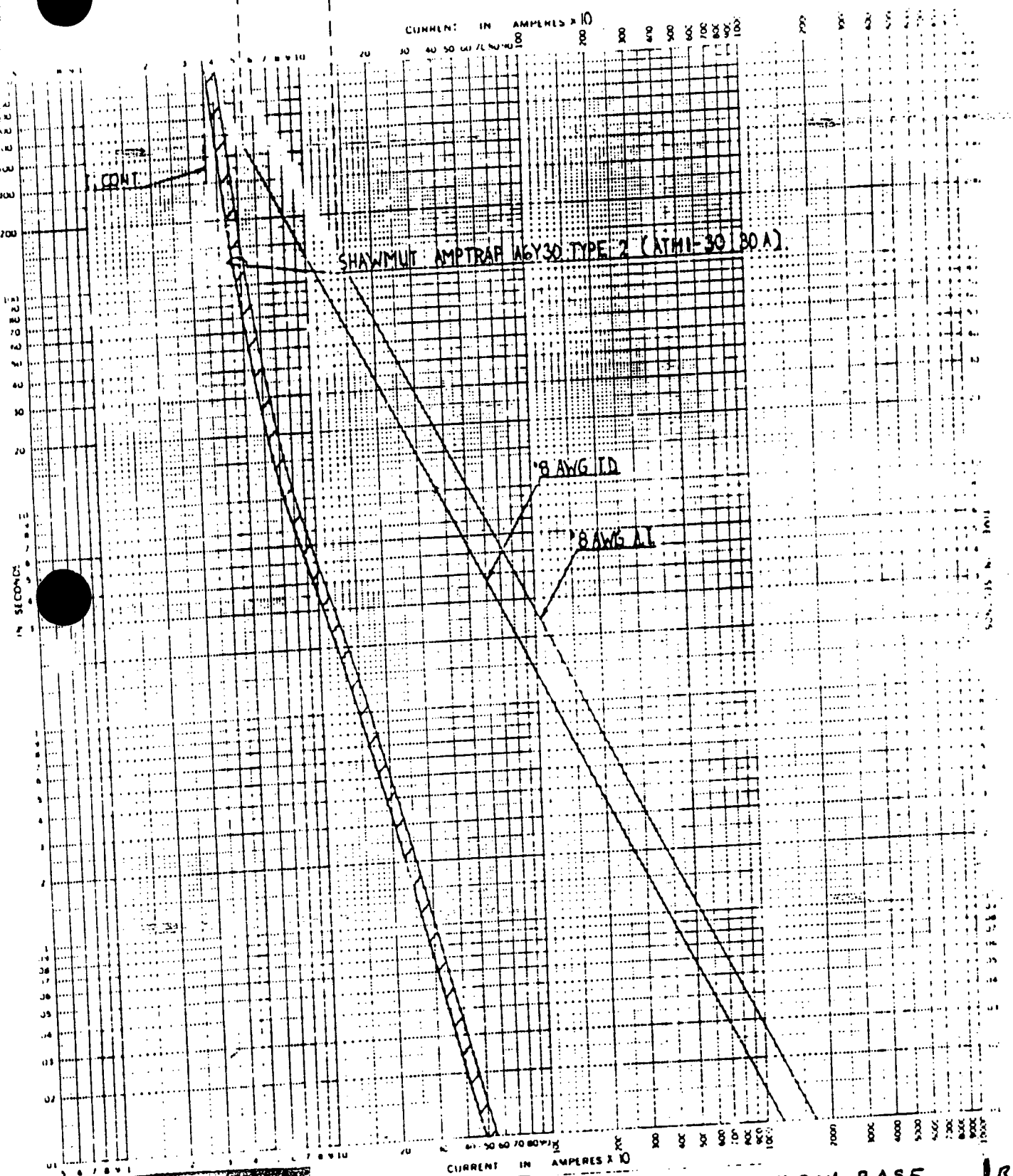
RII

COMPUTED YMB DATE 3-7-91

CHECKED EEH DATE 4/16/91

Prepared [signature] Date 2/2/90

Verified [signature] Date 2/2/90



TIME-CURRENT CHARACTERISTIC CURVES 480V BASE RH

Fuse Links In

Dated

P.T. starting at 25C with no initial load

Volts a.c. at

First periods on curves should be

No TC-123

Date

RECOMPUTED YMB DATE 3-7-91

CHECKED EH DATE 4/10/91

IEEE STD DATA Standards

1 Tests made at

2 Curves are plotted to

11-14-83 Prepared HA Date 2/2/90

Verified JMZ Date 2/2/90

50-390 WATTS BAR 1 TVA

Fire Protection/Appendix R Program Calculations
Books 1, 2, 3, 4, and 5

Rec'd w/ltr dtd 6/15/92...9206260059 3

APPENDIX D

PROTECTIVE DEVICES
TIME-CURRENT CURVES

Page 93 of ~~200~~ TMD 3-7-91

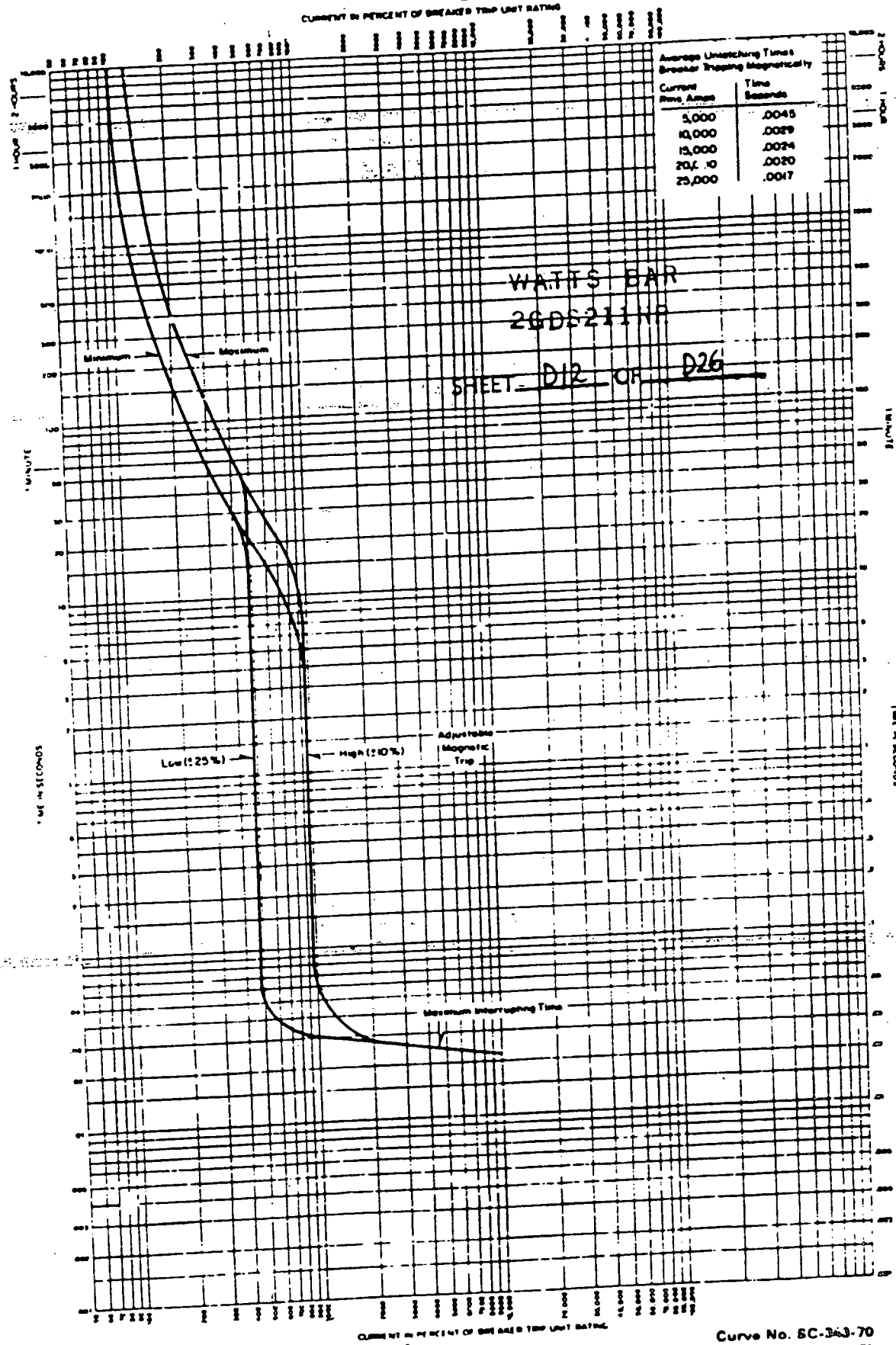
Application Data -160-A

Page D1 of D16

AB DE-ION® CIRCUIT BREAKERS

Types JA and KA
MARK 75® Type HKA

70-225 Amperes, 2 and 3 Poles, 600 Volts Ac Max.
250 Volts Dc



WATTS BAR
2GDE211NP
SHEET D12 OF D26

Prepared AA Date 2/12/80
Verified [illegible] Date 2/12/80

Maximum and Minimum Characteristic Curves
40°C Ambient, Cold Start - Thermal Magnetic

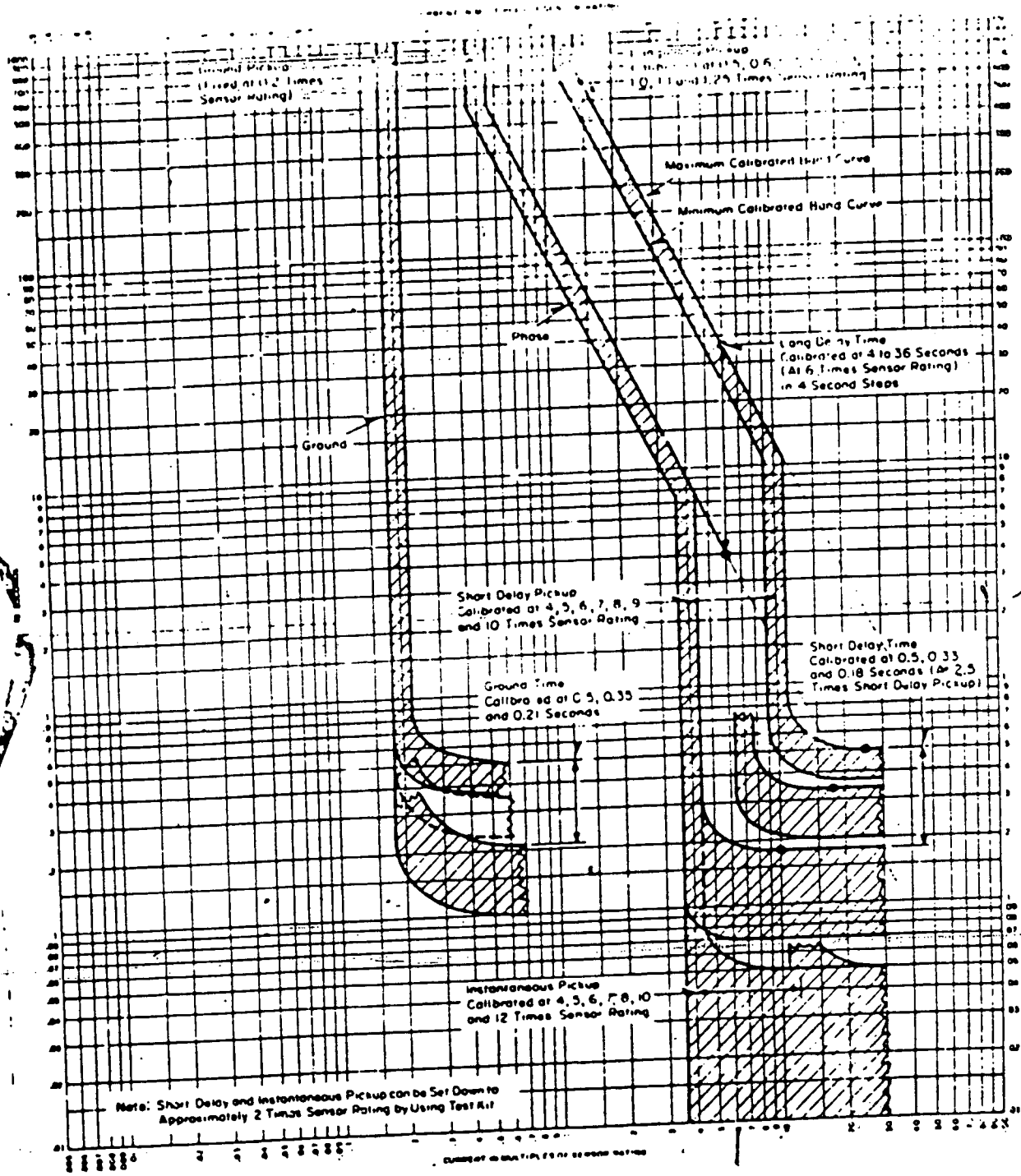
Interrupting Capacity (Symmetrical Amperes)

Type	240 Volts	480 Volts	600 Volts
JA, KA	25,000	22,000	22,000

Curve No. SC-363-70
January, 1971

Westinghouse Electric Corporation
Low Voltage Breaker Division, Beaver, Pa.

Application Data 33 760 8



Type DS Air Circuit Breakers
for Application up to 600 Volts A.C.
Time Current Characteristics

Curve No. 1

Reference No. 6784581 8

Prepared Date 2/12/90

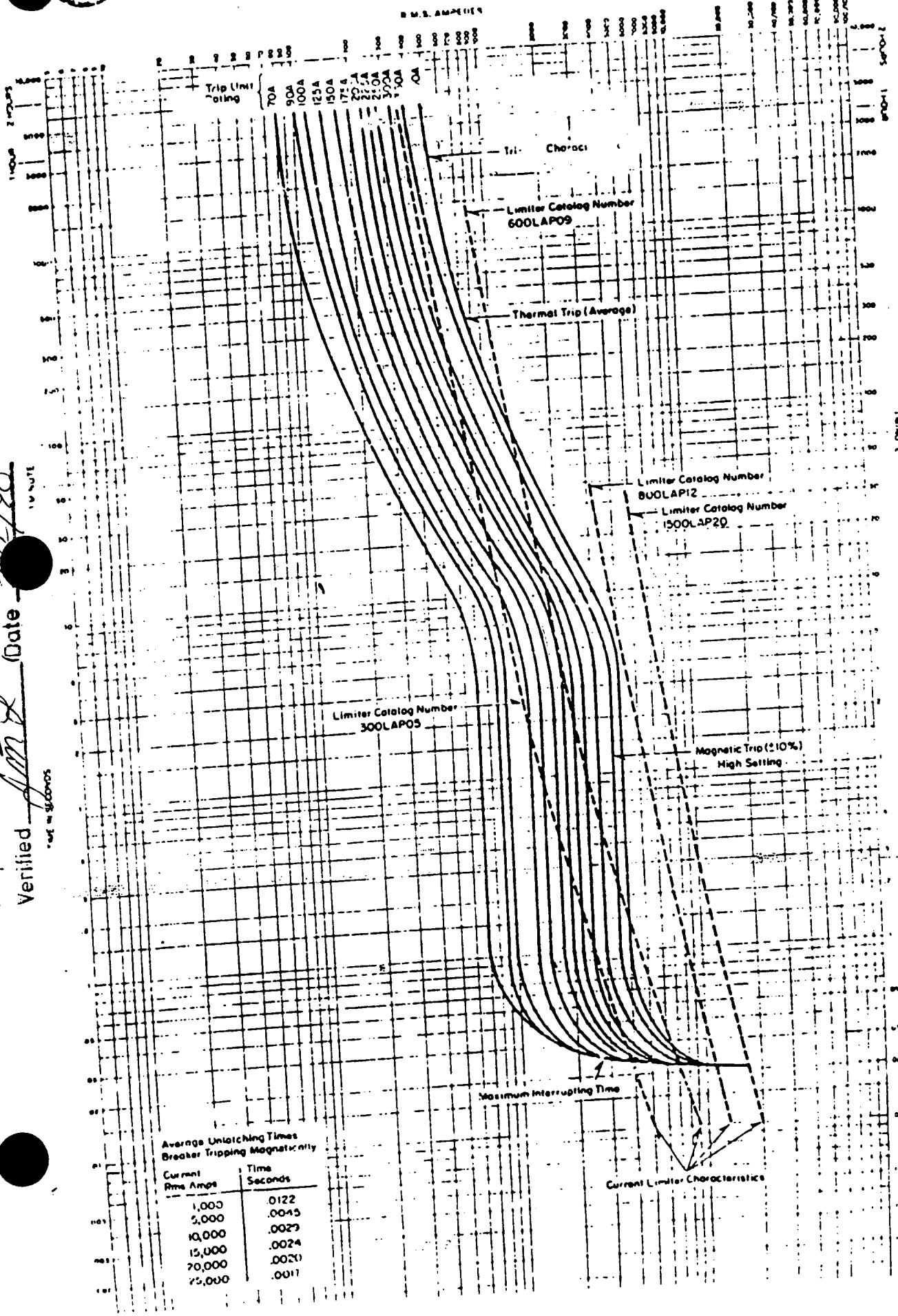
Verified Date 2/12/90

INITIAL TYPE LH

70-400 Amperes, 2 and 3 Poles, 600 Volts Ac Max.
250 Volts Dc

~~DFT~~ TMB 2/2/90

SHEET ~~DFT~~ 2GDS211RP



Average Unlatching Times
Breaker Tripping Magnetically

Current Rms Amps	Time Seconds
1,000	.0122
5,000	.0045
10,000	.0029
15,000	.0024
20,000	.0020
25,000	.0017

Prepared ..... Date 7/25/80

Verified ..... Date 7/25/80

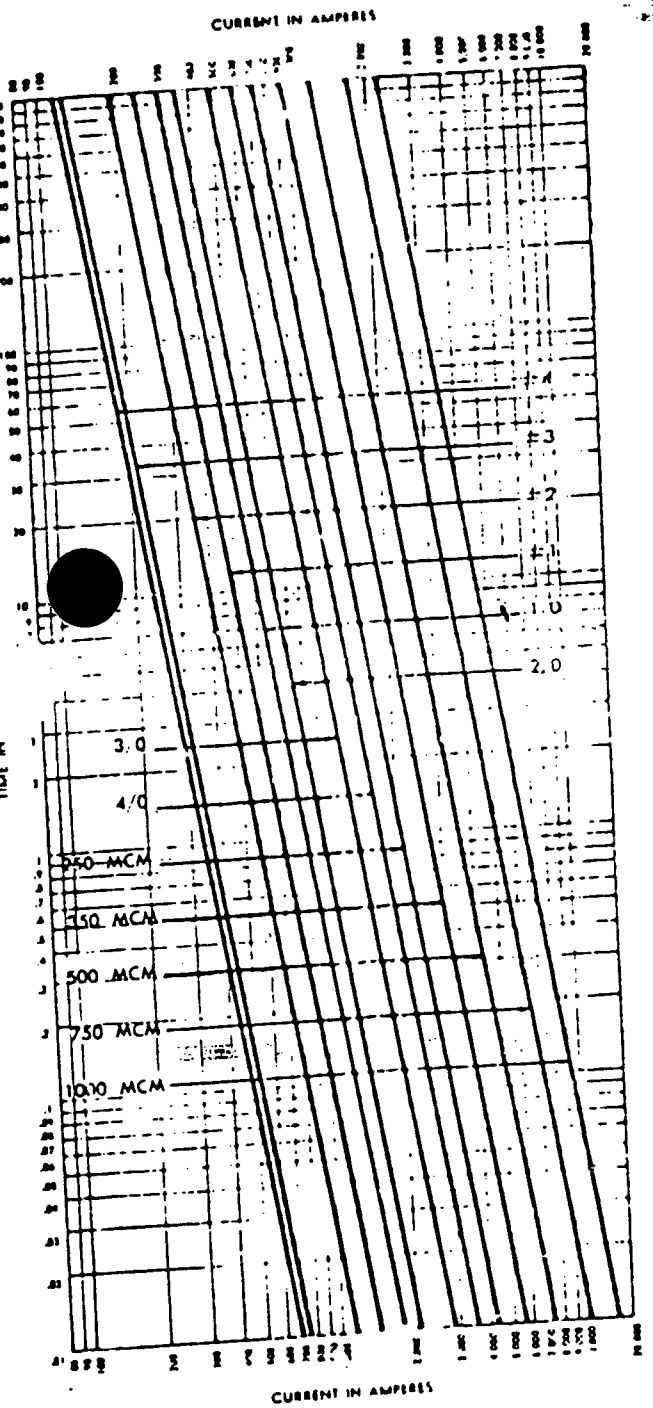
SHAWMUT CABLE PROTECTOR

SHEET ~~D22~~ OF ~~D26~~

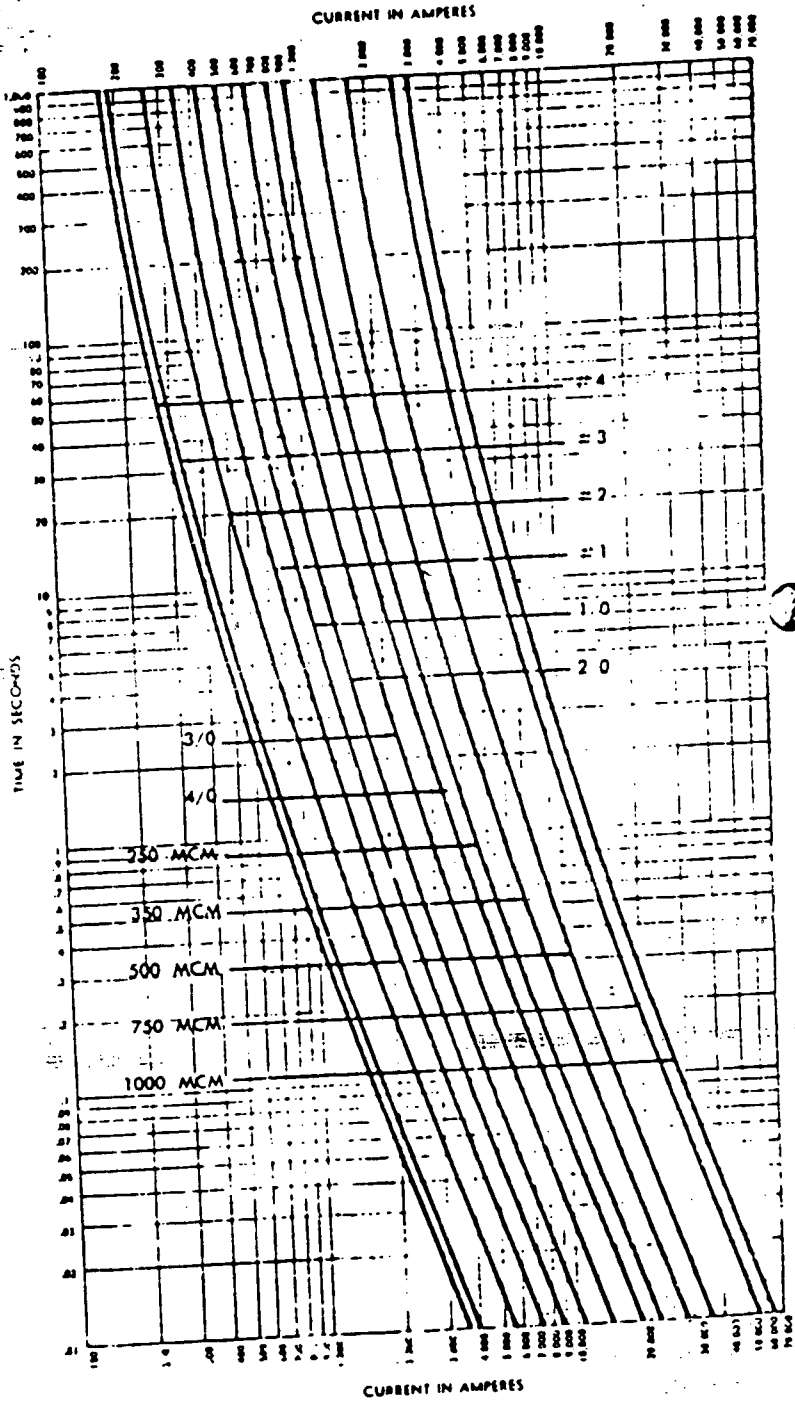
2GDS211RP

CHARACTERISTIC CURVES
600 V.A.C. or less
(For Copper Cables)

CP6

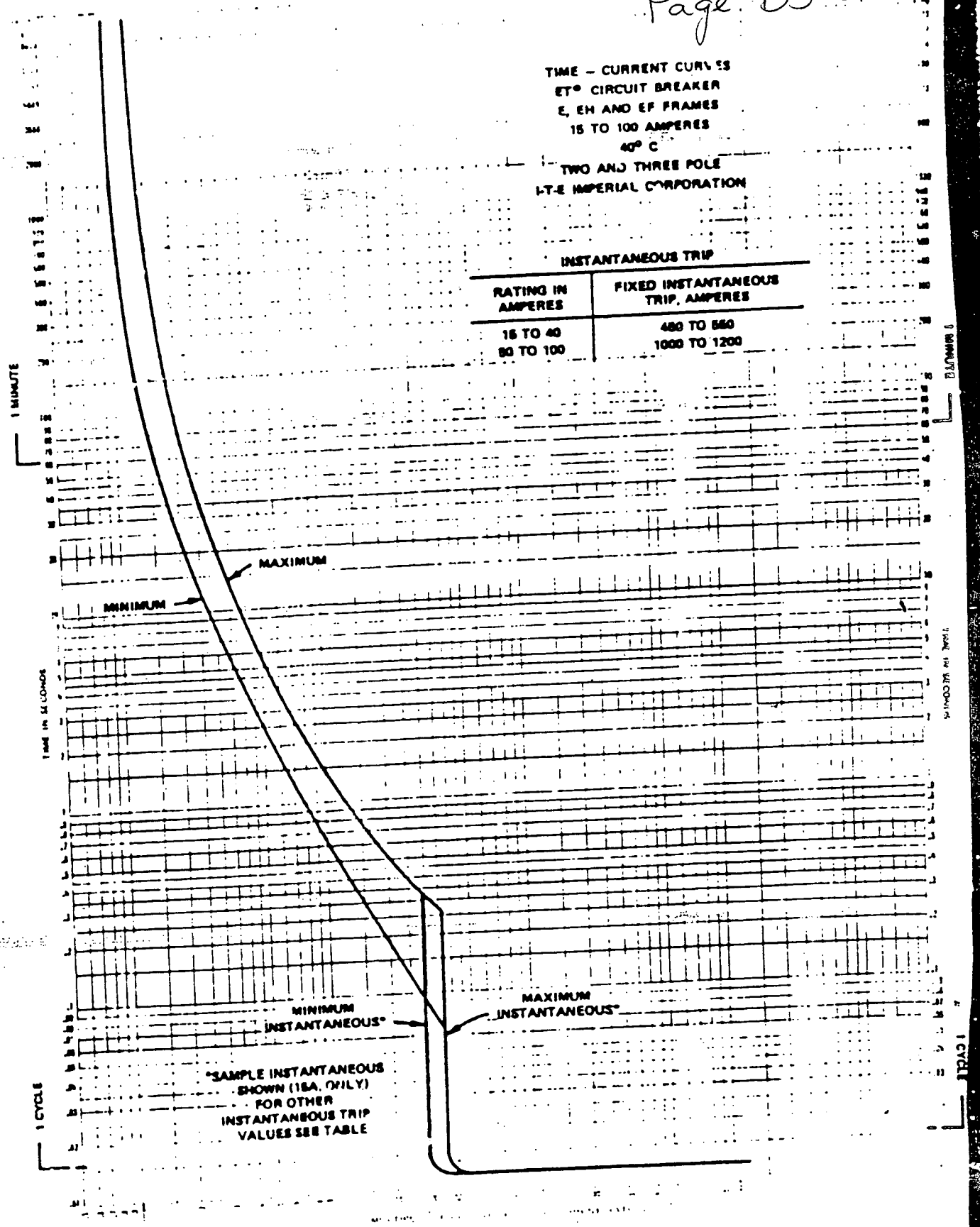


CP6A



Prepared AA Date 2/2/90

Verified Jm L Date 2/2/90



FOR APPLICATION AND COORDINATION PURPOSES ONLY. BASED ON 40°C AMBIENT COLD START.
E FRAME: 240 VOLTS, 60 HZ., 125/250 VOLTS DC.
EH FRAME: 480 VOLTS, 60 HZ., 250 VOLTS DC.
EF FRAME: 600 VOLTS, 60 HZ., 250 VOLTS DC.

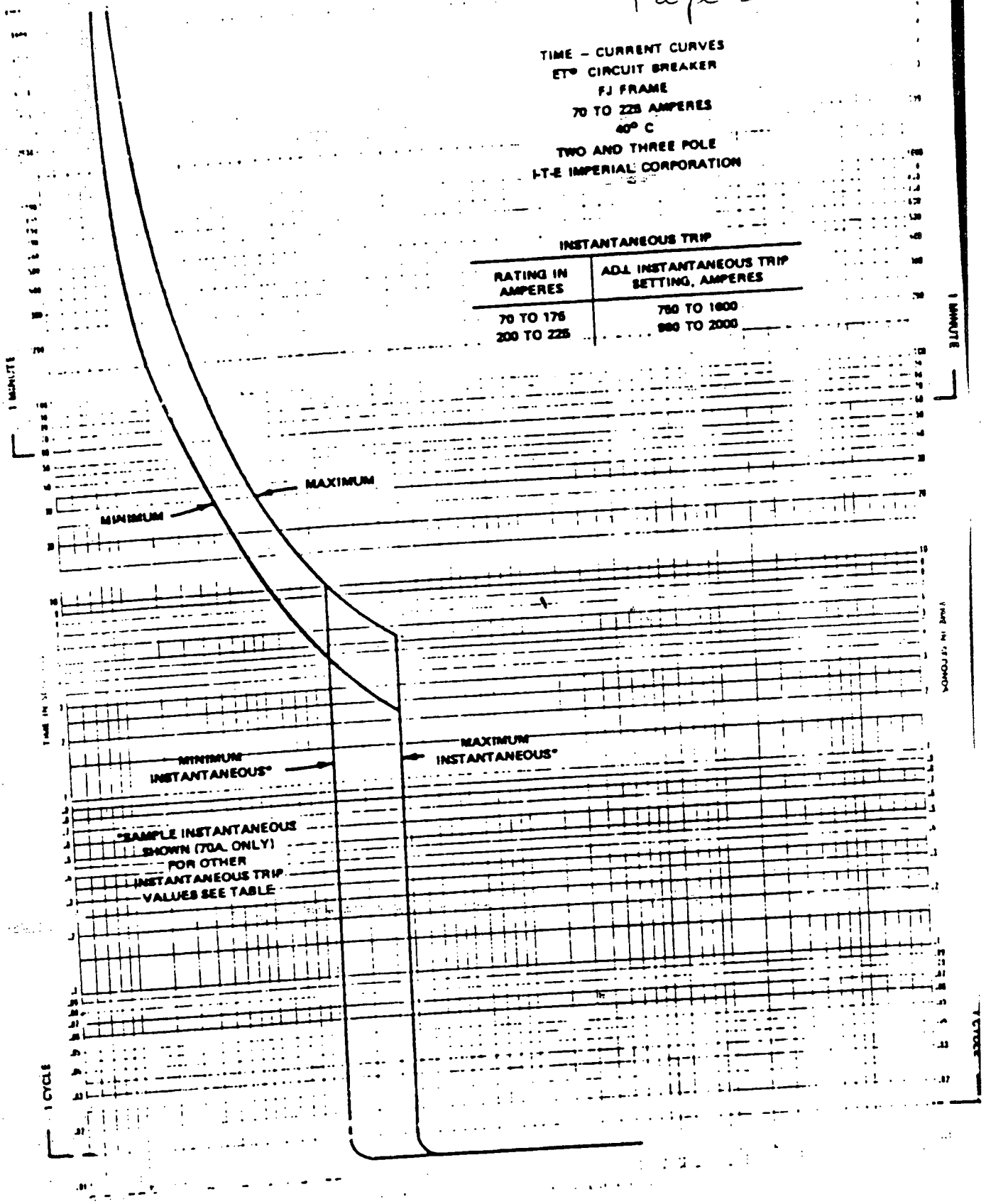
(E), (EH), (EF)-1A

Prepared HH Date 2/2/90

Verified JMF Date 2/2/90

TIME – CURRENT CURVES
ET° CIRCUIT BREAKER
FJ FRAME
70 TO 225 AMPERES
40° C
TWO AND THREE POLE
I-T-E IMPERIAL CORPORATION

INSTANTANEOUS TRIP	
RATING IN AMPERES	ADJ. INSTANTANEOUS TRIP SETTING, AMPERES
70 TO 175	750 TO 1600
200 TO 225	900 TO 2000



FOR APPLICATION AND COORDINATION PURPOSES ONLY. BASED ON 40°C AMBIENT COLD START. 600 VOLTS, 60 HZ, 750 VOLTS DC.

Prepared HA Date 2/2/90

Verified JMT Date 2/2/90

FJ-1A

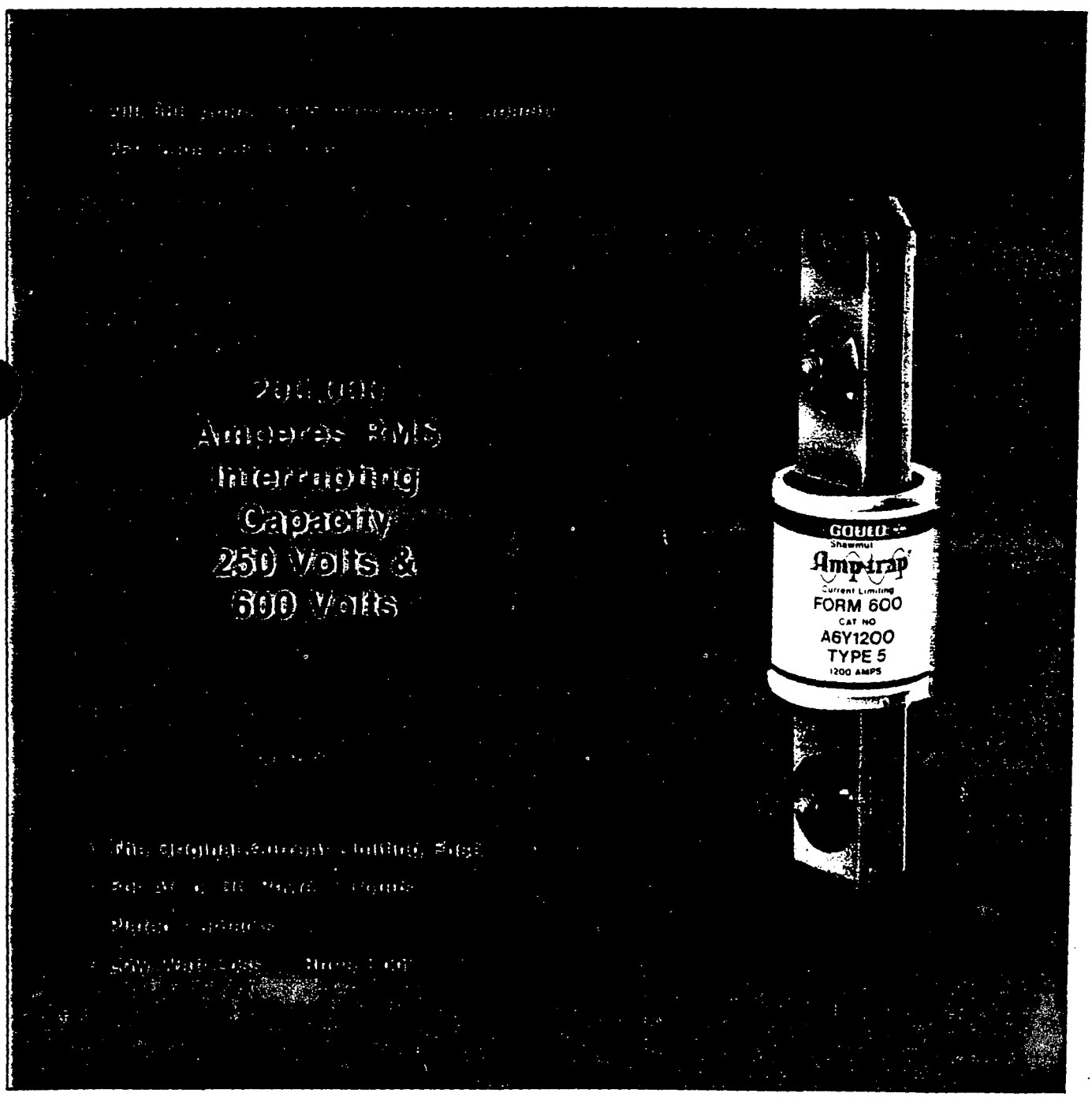
NBN EEB-MS-TIS-0011 RO

Page D7 of D16

Bulletin AT615

Page 99 of 200

Gould Shawmut Form 600 Amp-trap Current Limiting Fuse



Prepared HA Date 2/2/90

Verified JMT Date 2/2/90

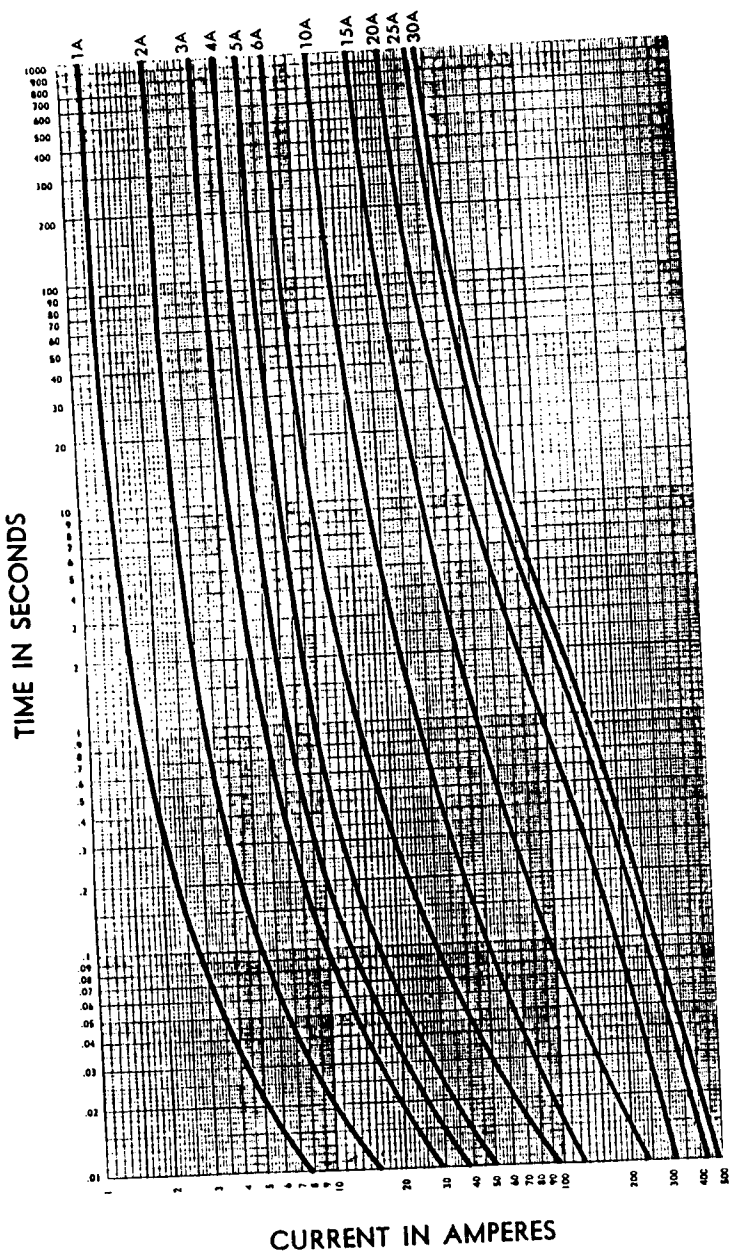
GOULD

Electronics & Electrical Products

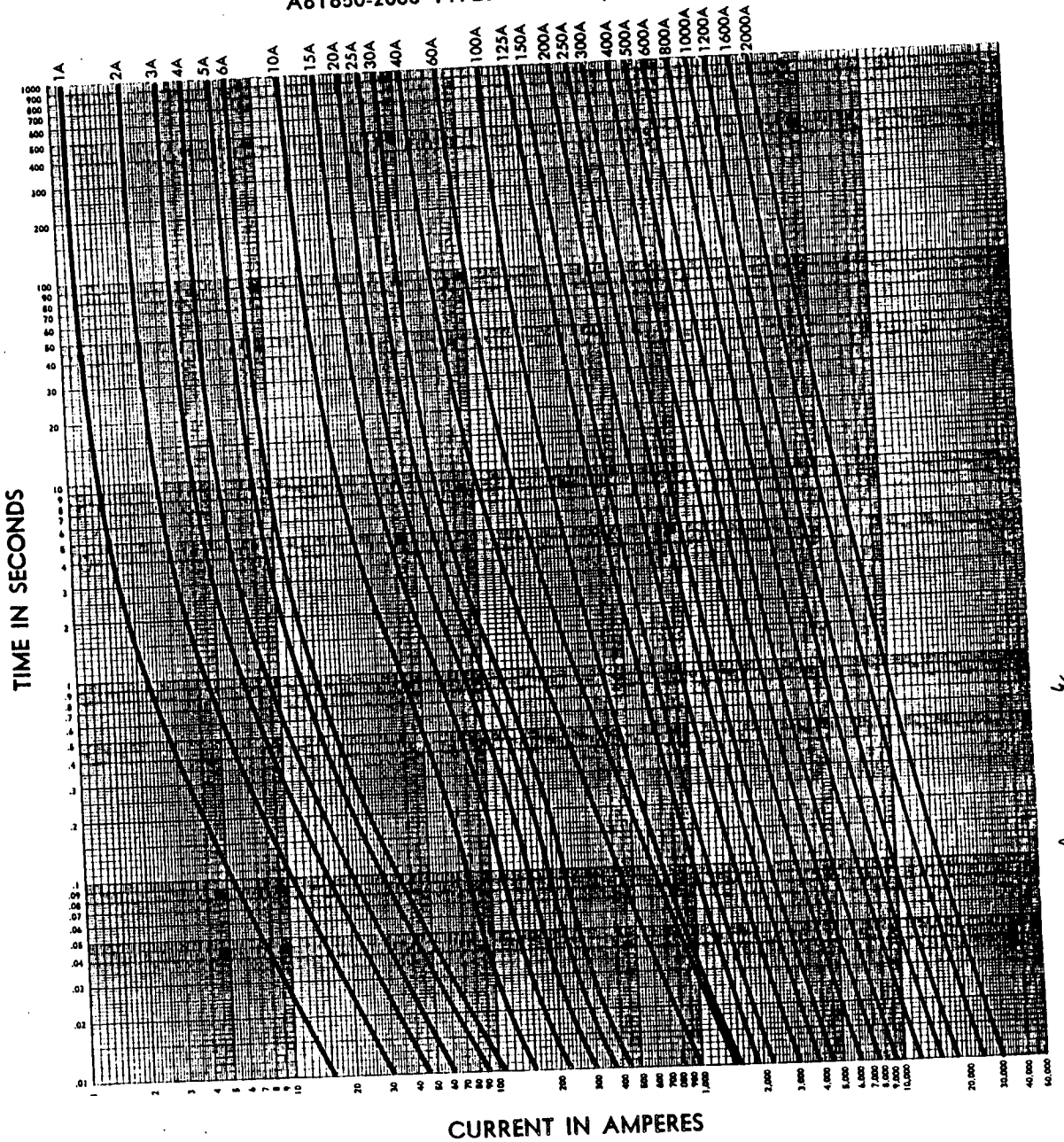
Prepared HA Date 2/2/80

Verified JMT Date 2/2/80

FORM 600 AMP-TRAP FUSE MELTING TIME-CURRENT CURVES ATMI-30, (600 VOLTS)

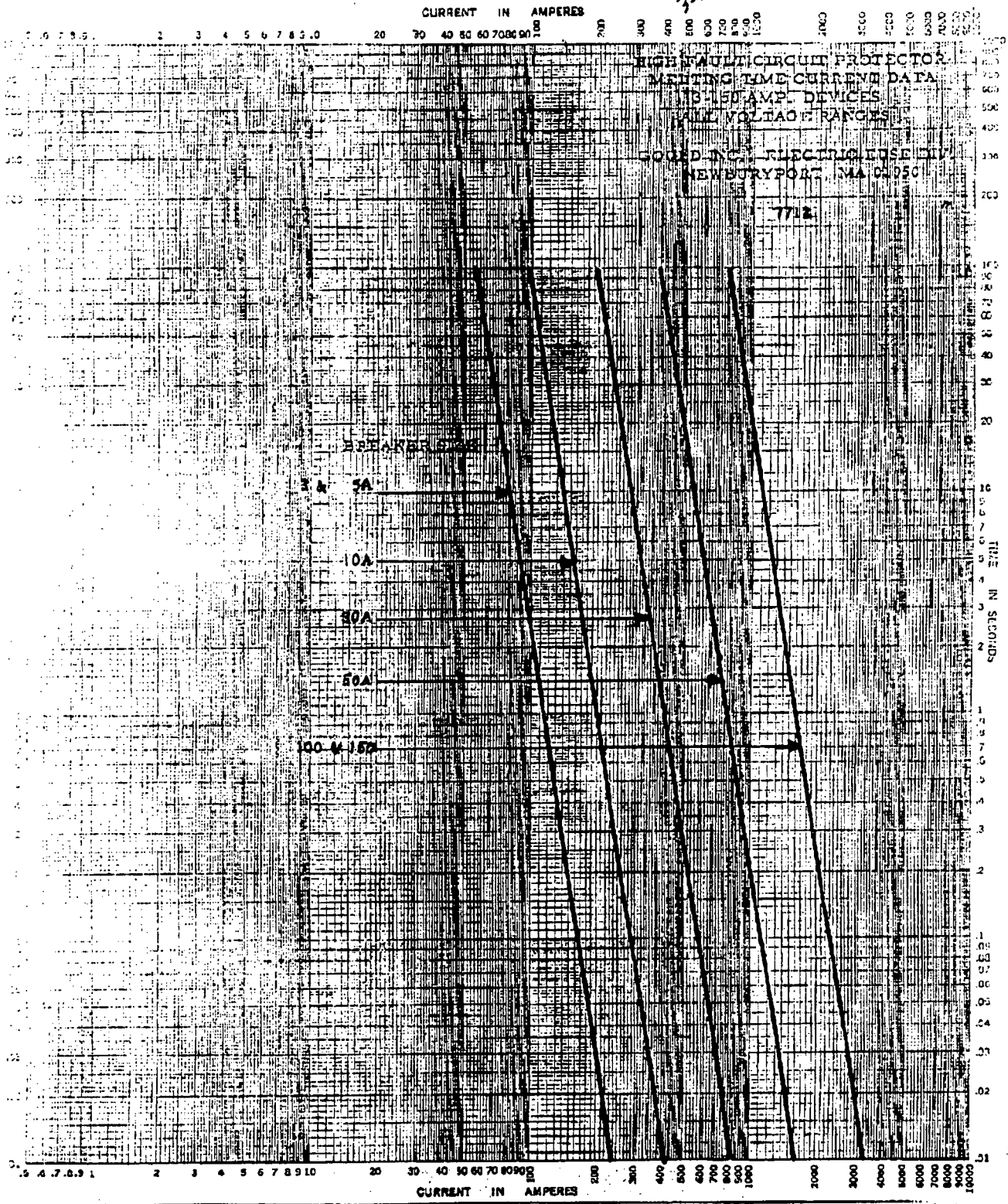


FORM 600 AMP-TRAP FUSE MELTING TIME-CURRENT CURVES A2Y OR A6Y1-600 TYPES 1, 3, 4 OR 5 (250 OR 600 VOLTS) A6Y650-2000 TYPES 4 OR 5 (600 VOLTS)



WBN EEB-MS-TIS-0011 R0 Page 100 of ~~200~~ 4mb 3-7-91 Page D8 of D16

ymb 3-7-91

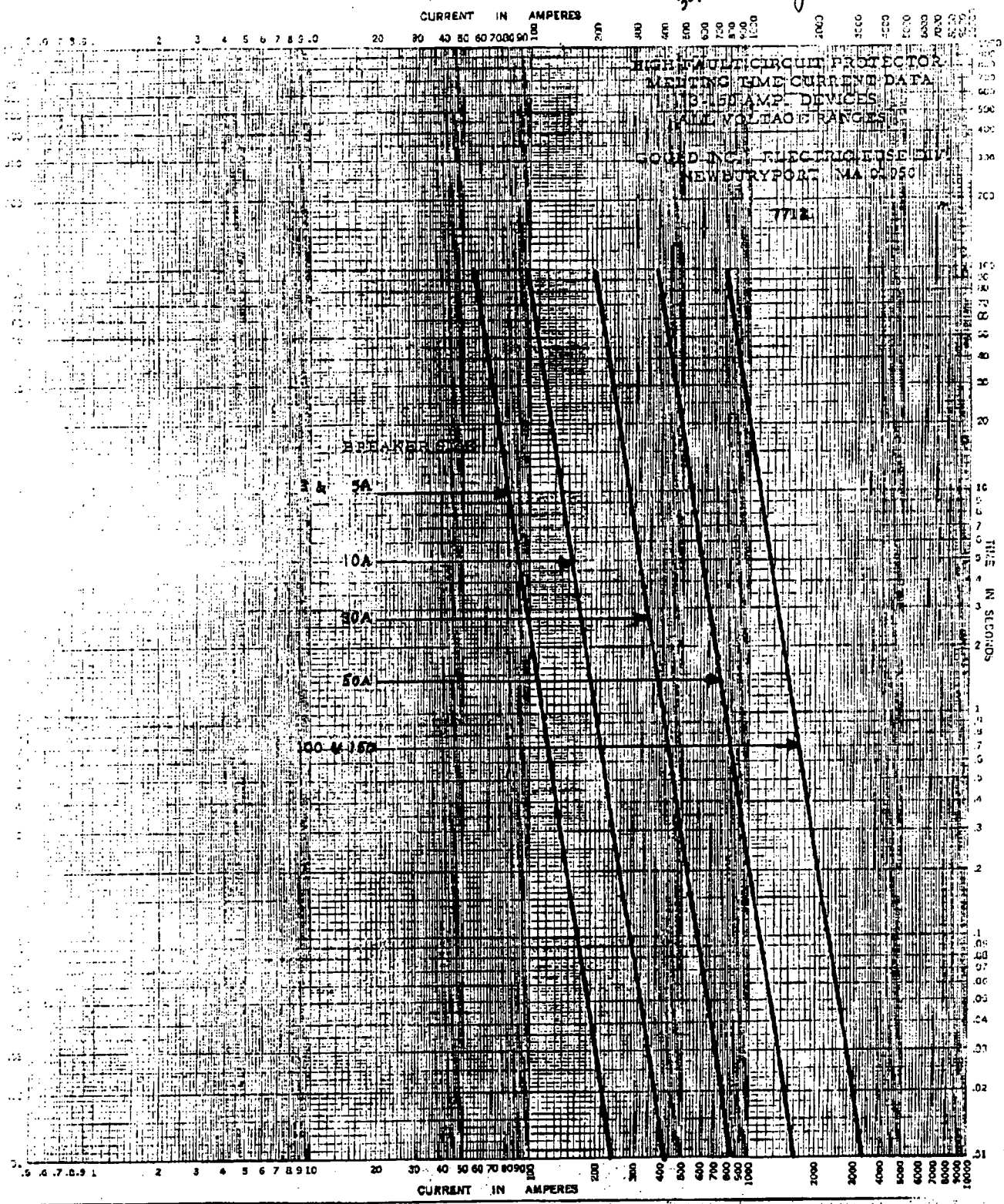


Shawmut Fuse Type HFCP

ITE CAT NO.	Fuse Rating
D15AB03	3 Amp
D15A005	5 Amp.
D15A010	10 Amp
D15A030	30 Amp
D15A050	50 Amp
D15AB100	100 Amp.
D15AB150	150 Amp

Prepared HA Date 2/2/90

Verified JMJ Date 2/2/90



Shawmut Fuse Type HFCP

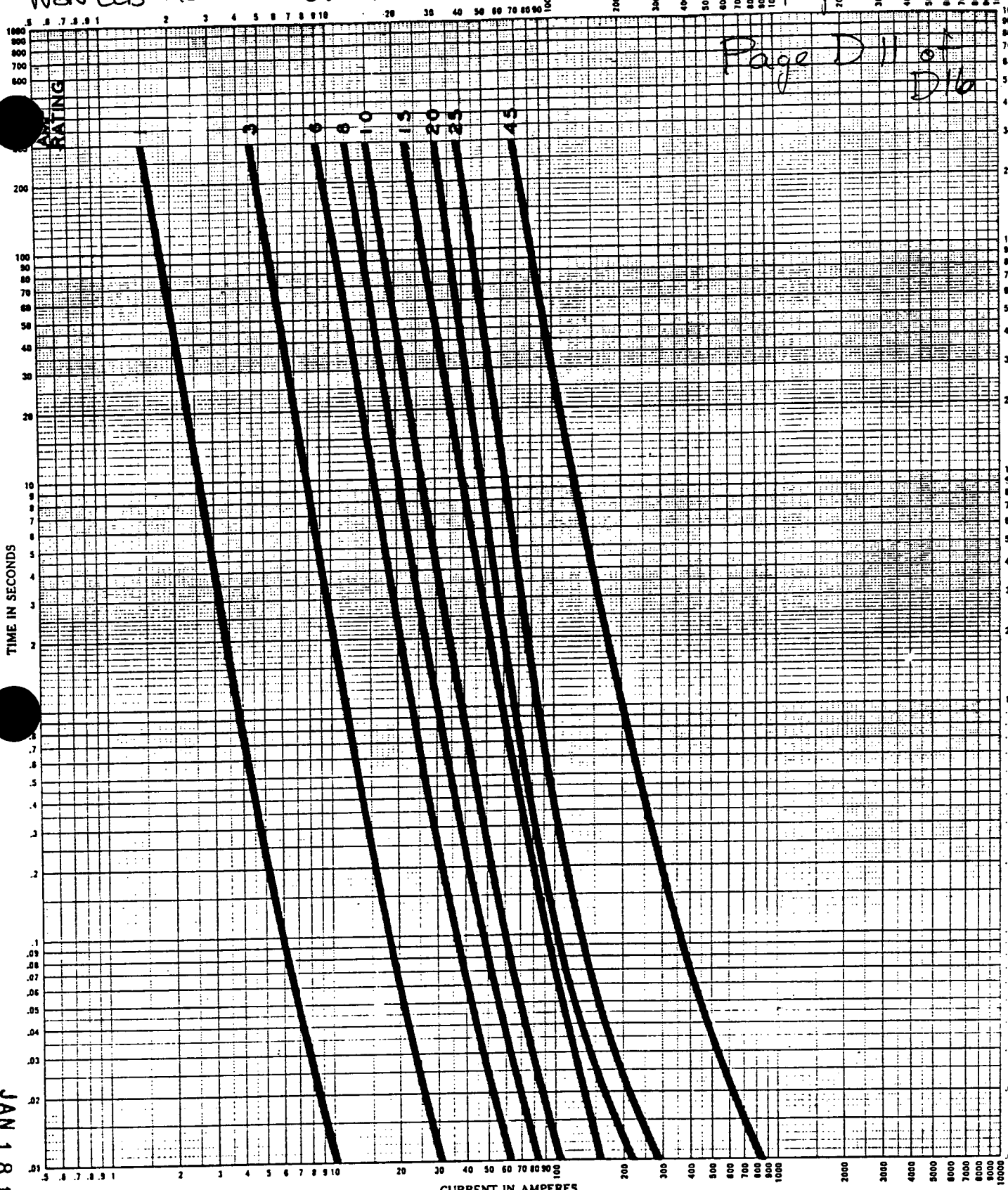
ITE CAT NO.	Fuse Rating
D15AB03	3 Amp
D15A005	5 Amp.
D15A010	10 Amp
D15A030	30 Amp
D15A050	50 Amp
D15AB100	100 Amp.
D15AB150	150 Amp

Prepared JH Date 2/2/90

Verified JMH Date 2/2/90

WBN EEB-MS-TI15-0011 R0

Page D11 of D16



KLC,

TOTAL CLEARING TIME-CURRENT CHARACTERISTIC CURVES

For KTN, KTS, KWN & KWS LIMITRON FAST-ACTING FUSES

Bussmann Division
Cooper Industries
St. Louis, MO 63178

BASIS FOR DATA Standards ..... Dated .....

1. Tests made at ..... Volts a-c at ..... p-f., Starting at 25C with no initial load .....
2. Curves are plotted to ..... Test points so variations should be .....

No. 50549
Date 8-22-74

Prepared HA Date 2/2/90

Verified JMZ Date 2/2/90

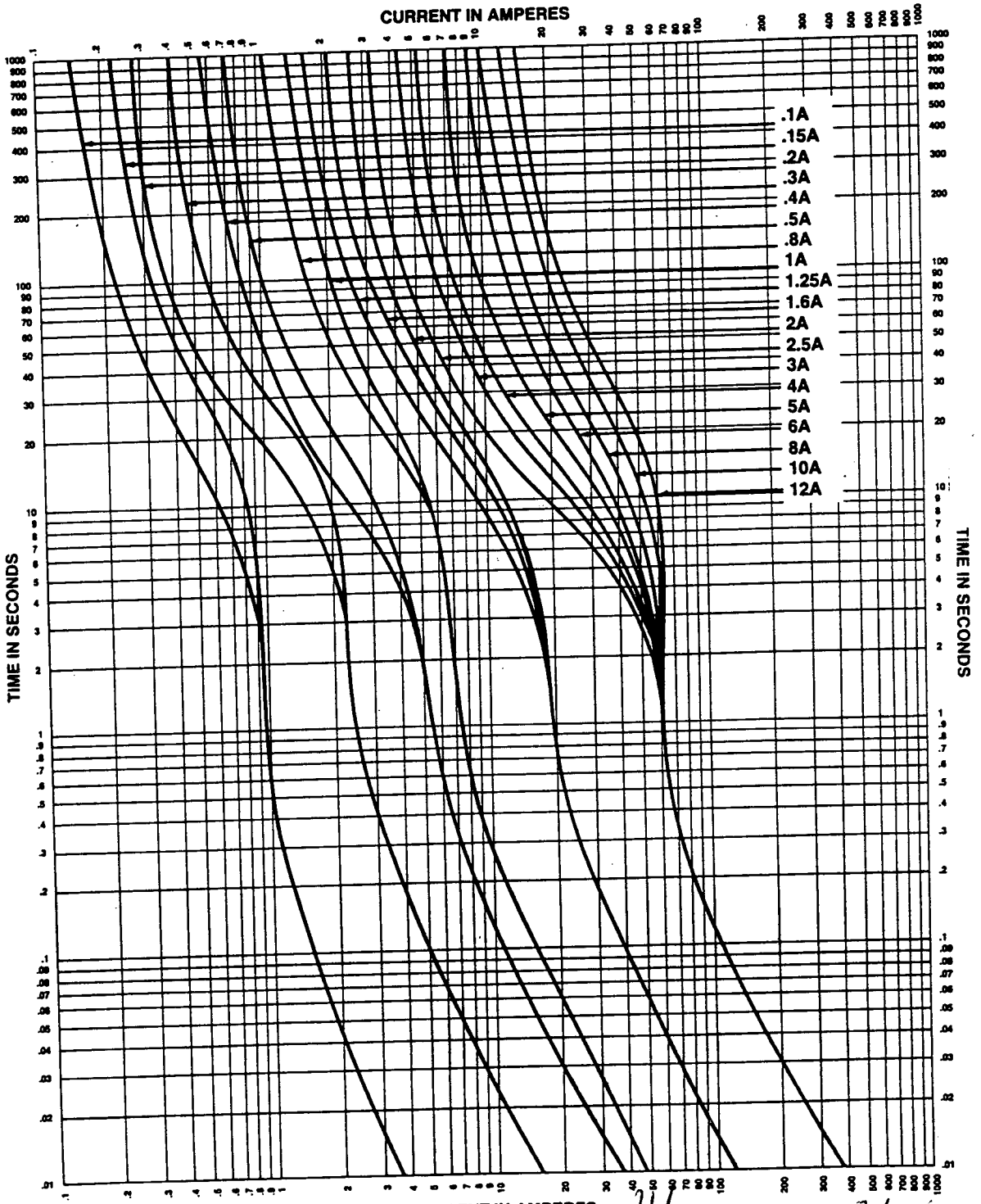
THIS DRAWING IS CURRENT AS OF DATE BELOW

JAN 18 1990

Tri-onic®–Class RK5
Time Delay Fuses

TRS

Melting Time—Current Data
0.1-12 Amperes, 600 Volts AC



Prepared HA Date 2/2/90

Verified JMZ Date 2/2/1380

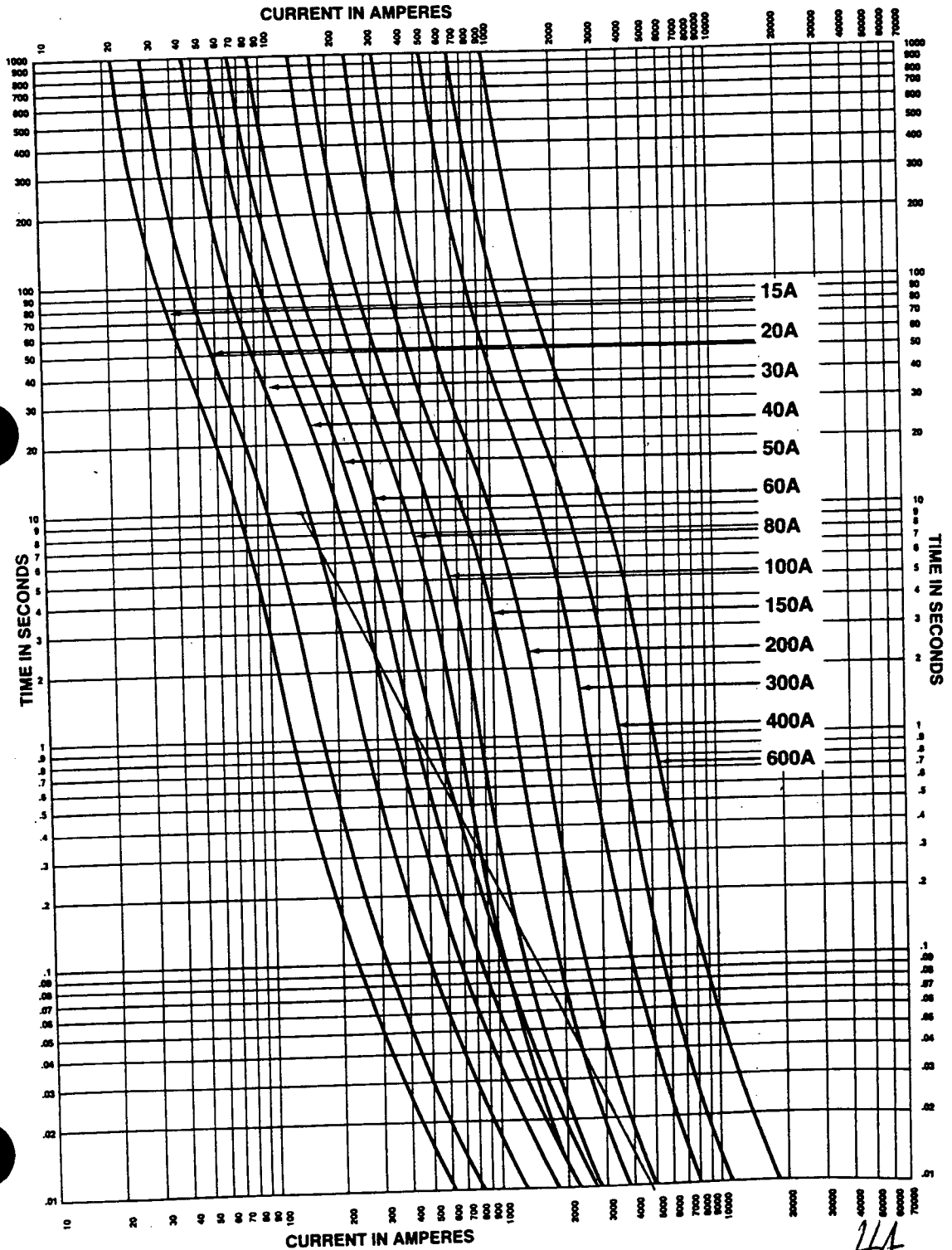
GOULD SHAWMUT

Tri-onic®–Class RK5

Time Delay Fuses

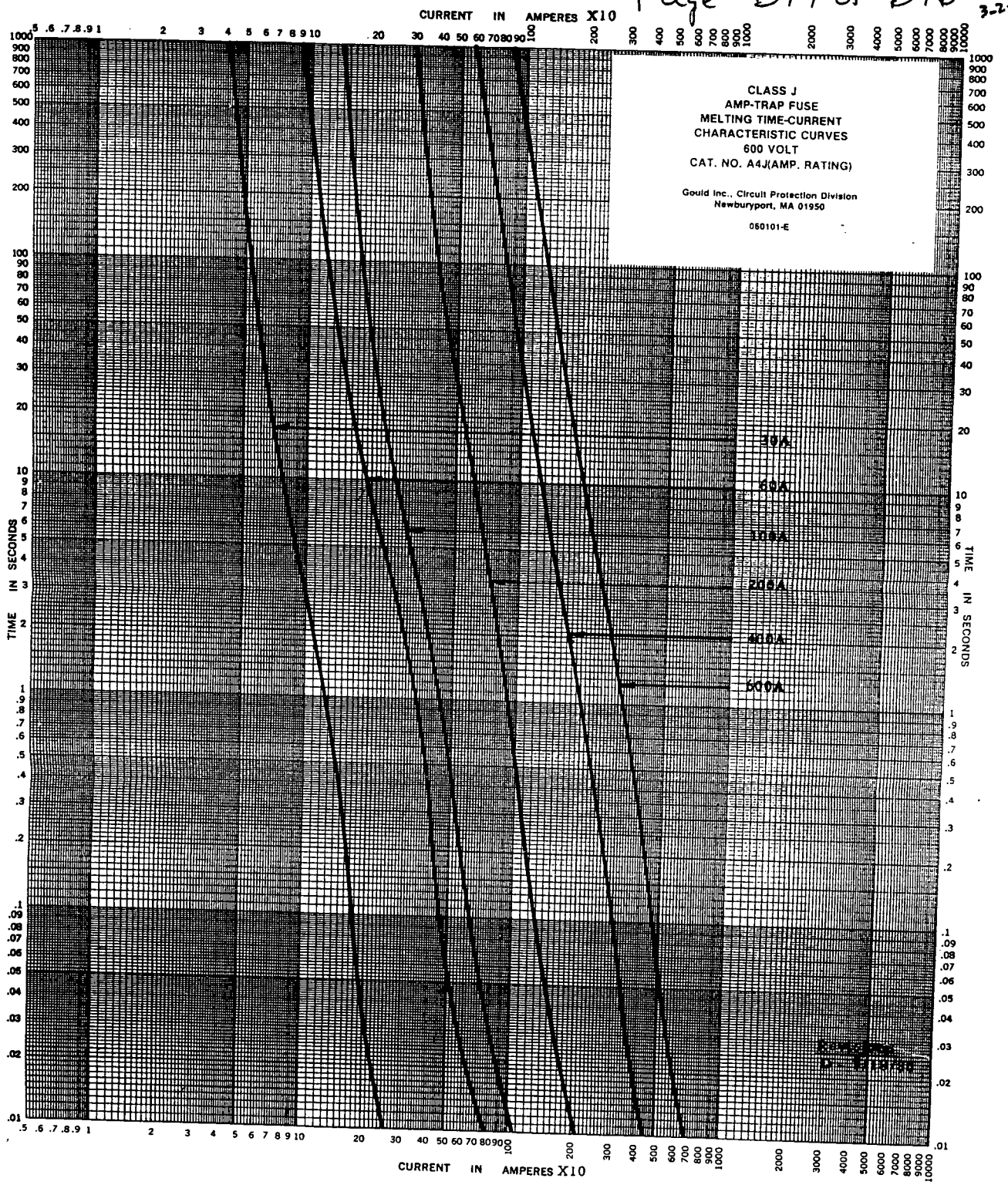
TRS

Melting Time—Current Data
15-600 Amperes, 600 Volts AC



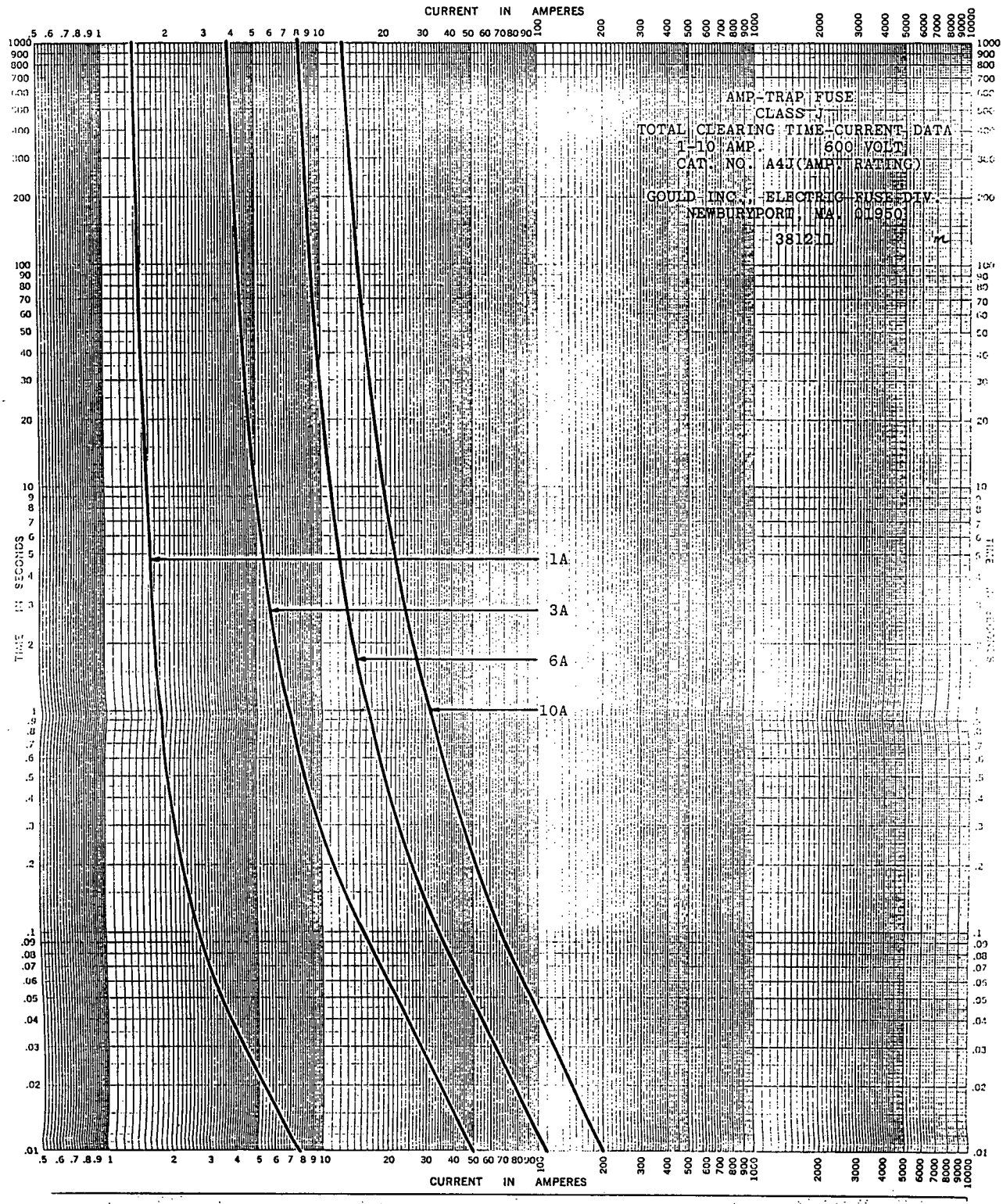
Prepared HA Date 2/4/90

Verified JMZ Date 2/2/90



Prepared HA Date 2/2/90

Verified JMS Date 2/2/90

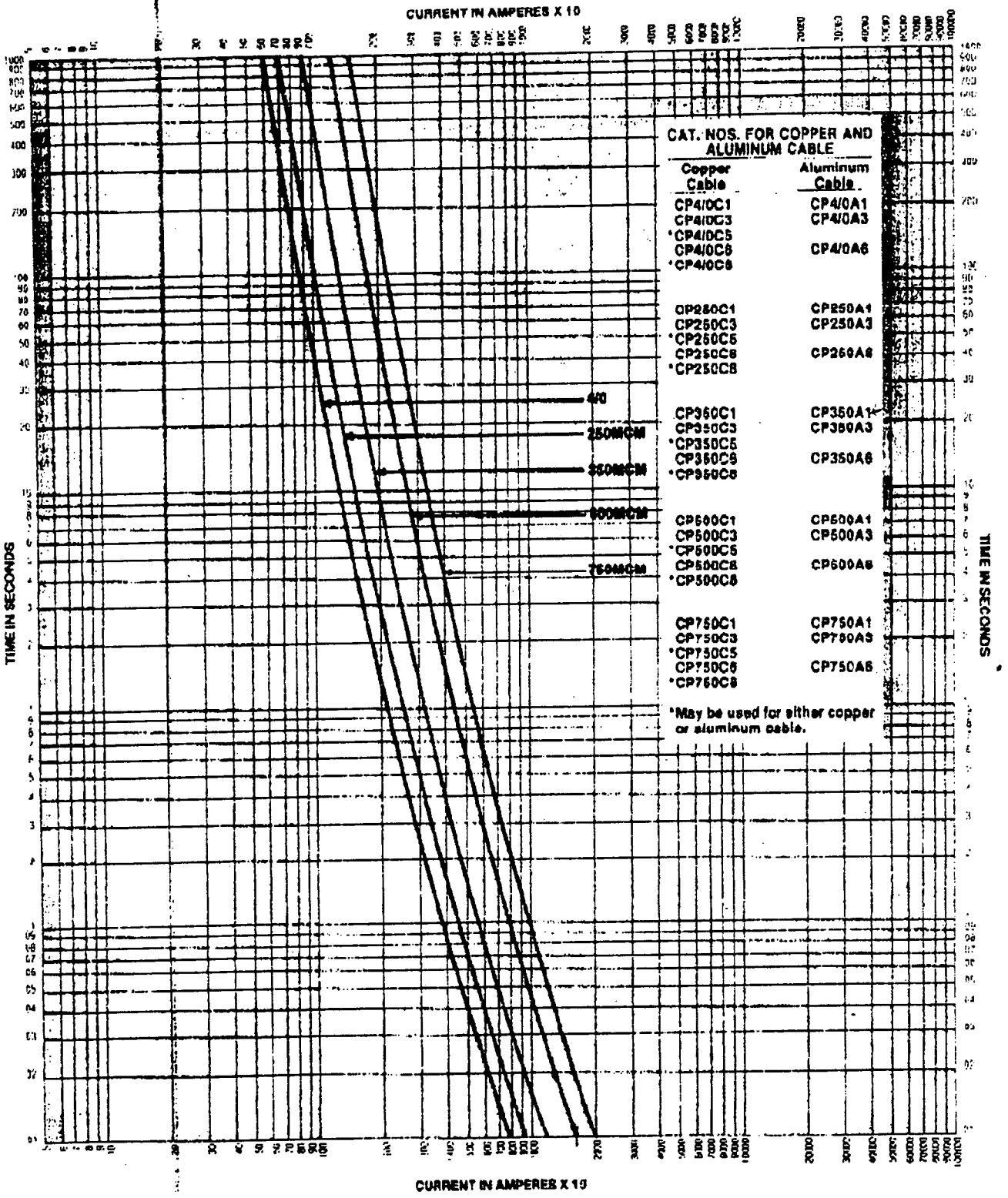


Prepared HA Date 2/2/90

Verified JMZ Date 2/2/90

STANDARD CP CABLE PROTECTOR FOR COPPER AND ALUMINUM CABLE 4/0, 250MCM, 350MCM, 500MCM, 750MCM 600 VOLTS

DB011C



Prepared HA Date 2/2/90

Verified JMD Date 2/2/90

Prepared JH Date 2/2/90 Checked JMY Date 2/2/90

APPENDIX E

DIT INFORMATION

Page 1 of 2

SARGENT & LUNDY ENGINEERS

DESIGN INFORMATION TRANSMITTAL Page E1 of 1

☐ SAFETY-RELATED ☒ NON-SAFETY-RELATED

DIT No. - WB-EPED-0010-00

Page 1 of

To S.G.H. ASHRAFI
EAD

CLIENT TENNESSEE VALLEY AUTHORITY

STATION WATTS BAR NUCLEAR PLANT UNIT(S) 1 & 2

PROJECT NO(S). B573-27

SUBJECT OPERATING TEMPERATURE FOR 480V NON 1E CABLES ROUTED IN CATEGORY I STRUCTURES.

SARGENT & LUNDY
EAD
JAN 24 1990

MODIFICATION OR DESIGN CHANGE NUMBERS(S) N/A

K. MAJMUDAR	EPED	Kiran L. Majmudar	REVIEWED
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.)

THE DESIGN INFORMATION TRANSMITTED VIA THIS DIT IS OBTAINED FROM APPROVED DOCUMENTS AND IS READY TO USE. THIS DIT DOES NOT CONTAIN ANY PRELIMINARY 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.)

PURPOSE OF ISSUE

TO TRANSMIT THE DESIGN INFORMATION AS REQUESTED BY EAD TO DEVELOPE AN ACCEPTANCE CRITERION FOR THE PROTECTION OF NON 1E 480V CABLES ROUTED IN CATEGORY I STRUCTURES.

IDENTIFICATION OF SPECIFIC DESIGN INFORMATION

AS DERIVED FROM TVA DESIGN STANDARD DS-E12.6.3, REV. 1, DAT ATTACHMENT I, TABLE 2; THE NON 1E 480V CABLES, WHICH ARE ROUTED IN CATEGORY I STRUCTURES OF THE PLANT ARE RATED FOR 90°C CONTINUOUSLY OPERATING TEMPERATURE. FURTHER, THESE NON 1E CABLES ARE HAVING SIZES FROM #14 AWG TO 400 MCM.

km 1/23/90

SOURCE OF INFORMATION

Calc. no. N/A Rev. and/or date Report no. N/A Rev. and/or date

Other DS-E12.6.3, REV. 1 dated 11/5/86.

DISTRIBUTION

G. BATES, EPED.

Form GQ-3.17.1 Rev. 2 (01-08-87)

WBN EEB-MS-TI15-0011 R0

Prepared HA Date 2/2/90

Verified JAM Date 2/2/90

Prepared Engineer Date 2/2/90 Checked TBT FOR RHB Date 2-5-90
D.L. Bates 2/5/90 R. Supkar 2-5-90

APPENDIX F

480V Power Cables Associated Circuits where protective devices were evaluated to be inadequate per acceptance criteria developed in Attachment 1. The protective devices are coded as "B" for a breaker and "F" for a secondary protection fuse.

480 V Bus	Compt. No.	Inadequate Protective Device
2-BD-212-A1	2C	B
	~~8A~~	~~F~~ JBP 2/12/90 RGB 2/12/90
2-MCC-214-A2	2D1	F
	6D1	F
	2E1	F
	6F1	F
	7D1	F
	3D1	F
	3E1	F
	3F1	F
	3F2	F
	4E1	F
	4F1	F
	5F1	F
	5F2	F
	6F2	F
	7E1	F
2-MCC-214-B1	3F2	F
	2F1	F
	9F1	F
	12F1	F
	12F2	F
1-MCC-232-B	2A, 9B, 10B, 13B	F
	3B	F
	3C	F
	6C	B
	6F1	F
	7B	F
	8B	F
	11F	F
	12F	F
	~~13B~~	~~F~~ JBP 2/12/90 RGB 2/12/90
	14B	F
	15A	F
	16A	F

WBN EEB-MS-TI15-0011 RO
480 V Non-Class 1E Power Cable Associated Circuits

Prepared Engineer/Cs T.Bates Date 2/2/90 2/5/90 Checked TBT FOR RHB R. Sudhakar Date 2-5-90 2-5-90

480 V Bus	Compt. No.	Inadequate Protective Device
1-MCC-232-A	3A, 2A, 9B, 10B	F
	3B	F
	3C	F
	4D	B
	7B	F
	8B	F
	10F	F
	11F	F
	13D	F,B TBT 2/14/90 REB 2/15/90
	14B	F
	~~14D~~	~~F~~ TBT 2/14/90
	15A	F REB 2/15/90
	16A	F
2-MCC-214-A1	2F1	F
	2F2	F
	3F1	F
	4F2	F
	10F1	F
	12E1	F
2-MCC-214-B2	2E1	F
	2F1	F
	3E1	F
	3F1	F
	4E1	F
	4F1	F
	4F2	F
	5E1	F
	5F1	F
	6E1	F
	6F1	F
	5F2	F
	7E1	F
	8E2	F
0-MCC-208-A	~~2C~~	~~F~~ TBT 2/12/90 REB 2/12/90
	6A	F
	6B	F
	7A	B
	7C	B
	8B	B
	8C	B
	8D	B

480 V Non-Class 1E Power Cable Associated Circuits

Prepared Engineer Star. Date 2/2/90 Checked TBT FOR RHR Date 2-5-90
G Bate 2/15/90 R. Supkar 2-5-90

480 V Bus	Compt. No.	Inadequate Protective Device
2-MCC-232-A	3B, 2A, 9B, 10B, 10F	F
	3C	F
	4D	B
	7B	F
	8B	F
	11D	F
	11F	F
	~~13B~~	~~F~~ TBT
	14B	F 2/15/90
	~~14B~~	~~F~~ AEB
	15A	F 2/15/90
	16A	F
2-MCC-232-B	2A, 9B, 10B, 13B	F
	3A	F
	3B	F
	3C	F
	6C	B
	6F1	F
	7B	F
	8B	F
	10F	F
	11F	F
	12F	F
	14B	F
	15A	F
	16A	F
1-MCC-214-A2	2D1	F
	2E1	F
	3D1	F
	3E1	F
	3F1	F
	3F2	F
	4E1	F
	4F1	F
	5F1	F
	5F2	F
	6F2	F
	7E1	F
	2E2	B, F
1-MCC-214-B2	2E1, 8F1	F
	2F1	F
	3E1	F
	3F1	F
	4E1	F

Prepared for ymuckar Date 2/2/90 Checked TBT FOR RHB Date 2-5-90
RLBates 2/5/90 R. Supkar 2-5-90

480 V Bus	Compt. No.	Inadequate Protective Device
1-MCC-214-B2 (Cont.)	4F1	F
	4F2	F
	5E1	F
	5F1	F
	6E1	F
	6F1	F
0-MCC-208-B	6F2	F
	8B	B
	8D	B
0-MCC-216-B	4F	F
0-MCC-217-A	3E	B
	4E	B
1-MCC-210-A	3F2	B
2-MCC-209-A	7D	B
0-MCC-218-1	6D	B
0-MCC-208-C	9A	B
	7C1	F
1-MCC-214-A1	2F2	F
	3F1	F
	3F2	F
	5F1	F
	10F1	F
	12E1	F
1-MCC-214-B1	2F2	F
	9F1	F
	12E1	F
	12F1	F
	13F1	F
1-MCC-213-B1	~~16E~~, 16A	F
	~~17E~~	~~F~~
	17A	B
1-MCC-213-A1	~~17E~~, 16A, 16B	F
~~1-BD-212-B2~~	~~3B~~	~~F~~

2/15/90 PER 2/15/90

WBN EEB-MS-TI15-0011 RO
480 V Non-Class 1E Power Cable Associated Circuits

Prepared kmcgahee/cw Date 2/2/90
GS Bates 2/5/90

Checked JBT FOR RNB Date 2-5-90
R Sundar 2-5-90

480 V Bus	Compt. No.	Inadequate Protective Device
~~2-BD-212-B2~~	~~3B~~	~~F~~ JBT 2/15/90 RGO 2/15/90
2-MCC-213-A1	JBT 2/15/90 ~~17E~~, 16A, 16B	F
2-MCC-213-B1	~~16E~~, 16A	F
	~~17E~~	F
	RGO 2/15/90 17A	B

Prepared S. Kelly by RLB Date 2/2/90 Checked TBT FOR RHB Date 2-5-90

APPENDIX G

Protective devices which potentially violate the criteria listed below:

1. Two breakers in series
2. A breaker and a fuse in series
3. A single fuse

480 V Bus	Compt. No.
0-BD-206-1	1A
	1C
	2B
	2C
	2D
	3A
	3B
	3C
	3D
	6A
	6B
	6C
	6D
	7C
	8B
	8C
	11A
	11B
	11C
	12B
	12C
	13A
	13B
	13C
0-BD-225-1	2D
	4B
	4C
	4D
	6B
	6C
	6D
	7C

Prepared Lora Kelley Date 2-2-90 Checked R. H. Bruchert Date 2/2/90

480 V Bus	Compt. No.
1-BD-203-A	4D
	6B
1-BD-203-B	3B
1-BD-212-A1	2C
1-BD-212-A2	3D
1-BD-212-B1	2B
	3B
	3D
1-BD-212-B2	3D
2-BD-203-A	6B
2-BD-203-B	3B
2-BD-212-A1	2C
2-BD-212-B1	2B
	3B
2-BD-212-B2	3D
0-MCC-61-1	2FF
	2KF
	1DF
	2BF
	5HR
	4DR
	4MR
	3DR
	3HR
	5BF
	6BF
0-MCC-207-A	4F1
0-MCC-218-1	2F2
	6D

Prepared Scott Kelley Date 2-2-90 Checked R. A. Buchanan Date 2/2/90

480 V Bus	Compt. No.
0-MCC-257-A	4F1
	4A
	4C1
0-MCC-208-A	2A
	2B
	2E2
	2F1
	2F2
	3A
	3B
	3C1
	3E1
	3E2
	3F1
	3F2
	4A
	4B
	4D2
	4E1
	4E2
	4F1
	4F2
	5C
	5E1
	5E2
	5F2
	6C
	6D
	6E1
	6E2
	6F1
	6F2
	7A
	7C
	7D
	7E1
	7E2
	7F1
	7F2
	8A
	8B
	8C
	8D
	8E

Prepared Scott Kelley Date 2-2-90 Checked R. H. Bucha Date 2/2/90

480 V Bus	Compt. No.
0-MCC-208-A (Cont.)	8F1
	8F2
	9D1
	9D2
	9E1
	9E2
	9F1
0-MCC-208-B	2A
	2C
	2E1
	2F2
	3A
	3E1
	3F2
	4A
	4B
	4F1
	5A
	5E2
	5F2
	6A
	6E1
	6F2
	7B
	7E1
	7E2
	7F1
	7F2
	8B
	8D
	8F1
	8F2
	9B
	9F2
	10A
	10D
	11A
	5F1
	6D

Prepared Scott Kelley Date 2-2-90 Checked R.H. Bucket Date 2/2/90

480 V Bus	Compt. No.
O-MCC-208-C	2A
	2C
	2E2
	2F1
	3A
	3E1
	3E2
	3F2
	4A
	4B
	4E2
	4F1
	5A
	5F2
	6E1
	6F1
	7A
	7C1
	7E1
	7E2
	7F1
	7F2
	8A
	8B
	8D
	8F1
	8F2
	9B
	9F2
	10A
	10B
	10C
	10E
	11C
	6F2
	9A
O-MCC-216-A	2A
	2B
	2C
	2D
	3A
	3B
	3C
	3D
	3F2
	4A
	4B

Prepared Scott Kelley Date 2-2-90 Checked R.H. Bucholt Date 2/2/90

480 V Bus	Compt. No.
O-MCC-216-A (cont.)	4E
	5A
	5E
	5F1
	6A
	6B
	6C
	6D
	6E
	8A
	8B
	8C
	8D
	6F1
	6F2
O-MCC-216-B	2A
	2B
	2C
	2D
	3A
	3B
	3C
	3E
	3F1
	3F2
	4A
	4B
	4E
	5A
	5B
	5E
	5F1
	6A
	6B
	6C
	6D
	6E

Prepared Scott Kelley Date 2-2-90 Checked R.H. Bucket Date 2/2/90

480 V Bus	Compt. No.
O-MCC-217-A	2A
	2B
	2D
	2E2
	2F1
	2F2
	3A
	3B
	3D
	3E
	3F1
	4D
	4E
	4F1
	5A
	5E2
	5F1
O-MCC-217-B	2B
	2C
	2D
	2E1
	2E2
	2F1
	2F2
	3B
	3C
	3D
	3E
	3F1
	3F2
	4D
	4F1
	5E1
	5E2
	5F1
O-MCC-226-1	2B
	2C
	2D
	2F1
	2F2
	3A
	3B
	3D
	3E1
	3E2

Prepared Scott Kelley Date 2-2-90 Checked R.H. Bucheit Date 2/2/90

480 V Bus	Compt. No.
0-MCC-266-1 (cont.)	3F1
	3F2
	4B
	4C
	4F1
	4F2
	5A
	5B
	5C
	5F2
	6A
	6B
	6C
	6E1
	6F1
	6F2
	7A
	7F1
	7F2
	5F1
0-MCC-249-1	2A
	2B
	2D
	2F1
	2F2
	3A
	3B
	3F2
	4A
	4B
	4F2
	5D1
	5D2
	5E2
	5F1
	5F2
	6A
	6C
	6E1
	6F1
	8A1
	8B1
	8C
	8E

Prepared Scott Kelley Date 2-2-90 Checked R.H. Bachert Date 2/2/90

480 V Bus	Compt. No.
1-MCC-209-A	6F1
	7D
	10C
	13E
1-MCC-209-C	3F2
1-MCC-210-A	2D
	2F2
	3F2
1-MCC-213-A1	16F1
	16F2
	17A
	17F1
	18C
	18D
	18F1
	18F2
1-MCC-213-A2	4A
	4B
1-MCC-213-B1	3F1
	16F1
	17A
	17F1
	17F2
	18C
	18D
1-MCC-213-B2	4A
	4B
	12A
1-MCC-214-A1	2D
	13A
	13B
	13C
1-MCC-214-A2	2A
	3A
	4A
	4B
	5A
	8A
	8B

Prepared Scott Kelley Date 2-2-90 Checked R.H. Bachert Date 2/2/90

480 V Bus	Compt. No.
1-MCC-214-B1	2D
	12A
	13A
	13B
	13C
1-MCC-214-B2	2B
	3B
	3C
	4B
	6B
	7D
	9A
1-MCC-215-A1	5A
	5F1
	5F2
	6A
	6F1
1-MCC-215-A2	2E2
	3E1
	3F1
	3F2
	5A
	5E1
	5F1
	6A
	6D
1-MCC-215-B1	5A
	5F1
	6A
1-MCC-215-B2	3E1
	3F1
	3F2
	5A
	5F2
	6D
1-MCC-232-A	4D
	4E
	5A
	6A
	6C
	15D
	16D

Prepared Scott Kelley Date 2-2-90 Checked R. H. Bachert Date 2/2/90

480 V Bus	Compt. No.
1-MCC-232-B	5E
	6A
	6C
	6D
	6E
	15D
	16D
2-MCC-209-A	7D
	10C
	13E
2-MCC-209-C	3F2
2-MCC-210-A	2D
	2F2
2-MCC-213-A1	16F1
	16F2
	17A
	18C
	18F1
	18F2
2-MCC-213-A2	4A
	4B
	13B
2-MCC-213-B1	3F1
	17A
	17F1
	17F2
	18C
2-MCC-213-B2	4A
	4B
	5A
	5B
2-MCC-214-A1	2D
	7D
	13A
	13C

Prepared Scott Kelley Date 2-2-90 Checked R.H. Buchat Date 2/2/90

480 V Bus	Compt. No.
2-MCC-214-B1	2D
	12A
	7D
	13A
	13C
2-MCC-214-A2	3A
	4A
	5A
	8A
	8B
2-MCC-214-B2	2B
	3B
	4B
	6B
	9A
2-MCC-215-A1	5A
	5F1
	5F2
	6A
2-MCC-215-B1	5A
	5F1
	6A
	5F2
2-MCC-215-A2	3E1
	3F1
	3F2
	5A
	6D
2-MCC-215-B2	3E1
	3F1
	3F2
	5A
	6D
	4B

Prepared Scott Kelley Date 2-2-90 Checked R.H. Burdett Date 2/2/90

480 V Bus	Compt. No.
2-MCC-232-A	15D
	16D
	4D
	4E
	6C
2-MCC-232-B	5E
	6C
	6D
	6E
	15D
	16D

EEB-MS-TI15-0011 RO

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared T.L. Bate Date 2/1/90 Checked R.H. Buchert Date 2/1/90

T.L. Bate 2/1/90 R.H. Buchert 2/1/90

O-LAC-233-160

COMPT NO	SERVICE	BKR MODEL NO	SENSOR RATING	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
	JB-299-5225	B-20	Y20			NA				8	L660
	O-JB-299-5225	B020	Y20			NA				8	L661
	O-JB-292-5205	B020	Y20			NA				8	L662
	O-JB-299-5226	B020	Y20			NA				8	L663
	O-JB-299-5226	B020	Y20			NA				8	L664

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WBN EEB-MS- TI15-0011 RO

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R. A. Bucheit / R Sundar Date 1/22/90 / 1-4-90 Checked [illegible] / W J Charity Date 1/26/90 / 1/20/90

O-BD-206-1

COMPT NO	SERVICE	BKR MODEL NO, DS-	SENSOR RATING	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
1A	O-MCC-208-B	206	600Y	58	3.75	400	0.18	—	N/A	400	PL316
1C	O-MCC-217-A	206	300Y	83	4	400	0.33	—	N/A	300X2	PL333
	O-MCC-217-B										
2B	O-MCC-249-1	206	600Y	75	4	400	0.18	—	N/A	300	PL305
										300	PL306
2C	O-MCC-216-A	206	300Y	66	4	400	0.33	—	N/A	4/0	PL328
	O-MCC-216-B										
2D	O-SW-270-TB	206	150Y	80	8	—	—	1000	N/A	2/0	PL344
	O-SW-271-AB									2/0	PL346
3A	O-SW-257-1	206	100Y	66	20	—	—	600	N/A	2/0X2	PL335
3B	O-XSW-239-1	206	300Y	67	4	—	—	600	N/A	4/0	PL338
3C	O-MCC 208-A	206	300Y	100	3.9	400	0.33		N/A	400	PL326
3D	O-MCC-208-C	206	600Y	57	4	400	0.18	—	N/A	400	PL323
6A	O-MTR-61-2D	206	300Y	76	8		—	800	N/A	300	PL300
	O-MTR-61-12D										
6B	O-MTR-61-42D	206	300Y	76	8		—	800	N/A	300	PL361
	O-MTR-61-52D										
6C	O-CRH-271-A1	206	300Y	80	8	400	0.33	N/A	N/A	300	PL384
6D	O-MTR-32-27	206	300Y	76	8	—	—	1000	N/A	4/0	PL370
7C	O-MTR-61-22D	206	300Y	75	8	—	—	800	N/A	300	PL310
	O-MTR-61-32D										
8B	O-MCC-61-1	206	400Y	75	8	400	0.33	N/A	N/A	300	PL350
8C	O-MTR-61-62D	206	300Y	75	8	—	—	800	N/A	300	PL365
	O-MTR-61-72D										

4mm B
3-7-91

BN EEB-MS- TI15-0011 RO

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchert Date 1-22-90
R. Supkar 1-4-90

Checked Kmg Nuclear Date 1/26/90
N.T Chung 1/20/90

O-BD-206-1

COMPT No	SERVICE	BKR MODEL NO DS-	SENSOR RATING	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
11A	O-MCC-208-B	206	600	60	3.75	400	0.18	N/A	N/A	400X2	PL318
11B	O-MCC-208-C	206	600	57.5	3.75	400	0.18	N/A	N/A	400X2	PL321
11C	O-MCC-217-A	206	300	82	3.75	400	0.33	N/A	N/A	400	PL335
	O-MCC-217-B										
12B	O-XSW-239-2	206	300	67	4	N/A	N/A	400	N/A	4/0	PL340
	2-1-V-11										
12C	O-MCC-216-B	206	300	67	4	400	0.33	N/A	N/A	4/0X2	PL330
	O-MCC-216-A			68	3.8						
13A	O-MTR-32-136	206	300	70	8	NA	N/A	950	N/A	4/0	PL410
13B	O-XSW-239-AC	206	300	70	12	800	0.33	N/A	N/A	4/0	PL342
13C	O-MCC-208-A	206	300	100	4	400	0.33	N/A	N/A	400	PL325

TMB 3-7-91

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Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R. H. Buchholz Date 1/22/90 Checked kmaynucker Date 1/26/90
R. Sudkar 1-9-90 N-T Chandy 1/30/90

O-BD-226-1

COMPT NO	SERVICE	BKR MODEL NO	SENSOR RATING	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE MCM	CABLE NO
2D	O-MCC-226-1	DS416	400 y	95	20	N/A	N/A	600	None	400	PLW357 PLW358
4B	O-MTR-24-20		600 y	100	4			1000		300	PLW325
4C	O-MTR-24-141		600 y	100	4			1000		300	PLW345
4D	O-MTR-24-144		600 y	100	4			1000		300	PLW350
6B	O-MTR-24-7		600 y	100	4			1000		300	PLW320
6C	O-MTR-24-10		600 y	100	4			1000		300	PLW330
6D	O-MTR-24-13		600 y	100	4			1000		300	PLW335
7C	O-MTR-24-17		600 y	100	4			1000		300	PLW340

35N713-1 R10

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Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchart Date 1/22/90 Checked [illegible] Date 1/26/90
R.H. Buchart 1/17/90 [illegible] 1/21/90

1-BD-203-A

COMPT No	SERVICE	BKR MODEL NO	SENSOR RATING	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
4D	1-MTR-85-A	DS-206	300	75	12	N/A	N/A	1000	N/A	400	1PL160
6B	1-INV-264-1	DS-206	300	50	20	0.18	4	N/A	N/A	4/0	1PL6661

Form GO-3.08.1 Rev. 2 SL-F647 04/84

45N-47-1, R12

N EEB-MS-TI15-0011 RO
bulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchert Date 1/22/90
R.H. Buchert 1/17/90

Checked Engineer Date 1/26/90
Engineer 1/21/90

1-BD-203-B

COMPT NO	SERVICE	BKR MODEL NO	SENSOR RATING	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
3B	1-MTR-85-B	DS-206	300 A Y	75	12	N/A	N/A	1000	N/A	300	1PL167

45N747-2, R12

N EEB-MS-TI15-0011 RO

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchert Date 1/22/90 Checked [illegible] Date 1/26/90
R.H. Buchert 1/22/90 [illegible] 1/21/90

1-BD-212-A1

COMPT No	SERVICE	BKR MODEL NO	SENSOR RATING (A)	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
2C	1-MTR-30-103	DS-416	Y 300	50	Y 8	N/A	N/A	Y 700	N/A	4/0	1PL5140
8A	D-XSW-239-1	DS-206	Y 300	75	Y 20	N/A	N/A	Y 600	GOULD/SHAWMUT CP350C5 Y	300	1PL4931

BN EEB-MS-TI15-0011 RO
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Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Burkart Date 1/22/90 Checked [illegible] Date 1/26/90
R.H. Burkart 1/10/90 Bruce Kelley 1/25/90

1-BD-212-A2

COMPT NO	SERVICE	BKR MODEL NO	SENSOR RATING	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
3D	0-MTR-32-25	DS-416	Y 300A	75	Y 12	N/A	N/A	Y 1000	N/A	4/0	1PL5033
										4/0	1PL5085
7B	1-MTR-30-159	DS-206	Y 300A	66	Y 12	N/A	N/A	Y 900	Y CP 4/0 C5 GOULD SHAWMUT	4/0	1PL5150

Form GO-3.08.1 Rev. 2 SL-F647 04/84

EEB-MS-TI15-0011 RO

ulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmajmudar Date 1/22/90 Checked R. H. Buchart Date 1/26/90
R. H. Buchart 1/10/90 Brown Kelley 1/25/90

1-BD-212-B1

COMPT NO	SERVICE	BKR MODEL NO	SENSOR RATING	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
2B	1-MTR-30-102	DS-416	Y 300A	50	Y 7.5	N/A	N/A	Y 700	N/A	4/0	1PL5160
3B	1-MTR-62-101	DS-416	Y 400A	75	Y 20	N/A	N/A	Y 1000	N/A.	400	1PL5025
3D	0-MTR-32-26	DS-416	Y 300A	75	Y 12	N/A	N/A	Y 980	N/A	400	1PL5080

TMO 3-7-91

CN EEB-MS-TI15-0011 RO Page H10 of H72

Calculation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchert Date 1/22/90 Checked Kenneth Mueller Date 1/26/90
R.H. Buchert 1/17/90 Scott Kelley 1/25/90
G.O. Bates 2/5/90 R. Supkar 2/5/90

1-BD-212-B2

COMPT No	SERVICE	BKR MODEL NO DS-	SENSOR RATING (A)	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE 2/15/90 ~~2/15/90~~	CABLE NO
3B	1-PENT-293-11	416	300	100	20	N/A	N/A	600	CPGA-87	400	1PL4610
									350	300	1PL4611
3D	D-BD-296-1	416	300	100	20	400	0.33	N/A	N/A	400	1PL4948
7A	1-MTR-30-162	206	300	65	12	N/A	N/A	900	CP410CS	410	1PL5170
8A	D-XSW-239-AC	206	300	75	20	N/A	N/A	600	CP250CS	300	1PL4932

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SN EEB-MS-TI15-0011 RO Page H11 of H72

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Burkart Date 1/22/90 Checked Kmagnuclear Date 1/26/90
Kmagnuclear 1/16/90 Robert Kelley 1/25/90

2-BD-203-A

COMPT NO	SERVICE	BKR MODEL NO	SENSOR RATING (A)	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
6B	2-INV-264-1	DS-206	300 Y	50	20	400	0.18	N/A	N/A	4/0	2PL6661

Form GQ-3.08.1 Rev. 2 SL-F647 04/84

WBN-EEB-MS-TI15-0011 R0

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Engineering Staff / R.H. Bucholt Date 1/22/90 / 1/17/90 Checked R.H. Bucholt / Fred Kelley Date 1/26/90 / 1/25/90

2-BD-203-B

COMPT No	SERVICE	BKR MODEL NO	SENSOR RATING	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
3B	2-MTR-85-B	DS-206	300Y	75	12Y	—	—	Y/1000	N/A	300	2PL167

45N747-2,R13

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Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmgmucker Date 1/22/90 Checked R. H. Buchert Date 1/26/90
R. H. Buchert 1/10/90 Scott Kelley 1/25/90

2-BD-212-A1

COMPT No	SERVICE	BKR MODEL NO	SENSOR RATING	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
2C	2-MTR-30-104	DS-416	N 600A	50	4 8	N/A	N/A	4 700	N/A	410	2PL5140
8A	CHGR 0-~~XSW~~-239-2	DS-206	4 300A	75	4 20	N/A	N/A	4 600	~~TX~~ Y fuse REQ CP6 CP350C5	4/12/90 300	2PL4931, PL341

Form GO-3.08.1 Rev. 2 SL-F647 04/84

N EEB-MS-TI15-0011 RO

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R. H. Buchart Date 1/22/90 Checked kmajmudar Date 1/26/90
kmajmudar 1/16/90 R. H. Buchart 1/21/90

2-BD-212-A2

COMPT NO	SERVICE	BKR MODEL NO	SENSOR RATING (A)	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
7B	2-MTR-30-274	DS-206	300 Y	67	12	N/A	N/A	910	SHAWMUT CP410 C5 Y	4/0	2PL5150
7C	0-MTR-30-136	DS-206	200 Y	75	12	N/A	N/A	1100	SHAWMUT CP410 C5 Y	4/0	2PL5111

N EEB-MS-TI15-0011 RO Page H15 of H72

bulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmaghundar Date 1/22/90 Checked R.H. Buchat Date 1/26/90
kmaghundar 1/16/90 R.H. Buchat 1/21/90

2-BD-212-B1

COMPT NO	SERVICE	BKR MODEL NO	SENSOR RATING (A)	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
2B	2-MTR-30-105	DS-416	300	50	8	N/A	N/A	700	N/A	4/0	2PL5160
3B	2-MTR-62-101	DS-416	400	75	20	N/A	N/A	1000	N/A	400	2PL5025

N EEB-MS-TI15-0011 RO

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmaghmadar Date 1/22/90 Checked R.H. Bucholt Date 1/26/90
kmaghmadar 1/16/90 R.H. Bucholt 1/21/90
[illegible] 2/5/90 R. Supkar 2/5/90

2-BD-212-B2

COMPT No	SERVICE	BKR MODEL NO	SENSOR RATING (A)	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE 2/15/90 REO 2/15/90	CABLE NO
3B	2-PENT-293-11	DS-416	Y 300	100	Y 20	N/A	N/A	Y 600	CP6A-87 350	400 300	2PL4610 2PL4611
3D	0-BD-206-1/90	"	Y 300	100	Y 20	Y 400	0.33	N/A	N/A	400	2PL4968
7A	2-MTR-30-278	DS-206	Y 300	65	Y 12	N/A	N/A	Y 900	Gould CP 4/0 C5	4/0	2PL5170
7C	0-MTR-30-139	"	Y 200	77.5	Y 12	N/A	N/A	Y 1100	Gould CP 4/0 C5	4/0	2PL5100

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Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R. Supkar Date 1-29-90 Checked G Bates Date 1/29/90

O-MCC-61-1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		MCP		(A)		FH	MFR	MODEL	RATING		
	O-MTR-61-126/CD									12	PL2841
2E	O-MTR-61-126/GP	23480RC		480?		47				8	PL2842
	O-MTR-61-136/CD									12	PL2844
2KF	O-MTR-61-136/GP	23480RC		480		48				8	PL2845
1DF	O-MTR-61-116/CD	0358RC		40		29				12	PL2846
	O-MTR-61-A									10	PL4145
	O-MTR-61-B									10	PL4160
	O-MTR-61-C									10	PL4190
	O-MTR-61-D									6	PL4123
	O-MTR-61-E									6	PL4235
2BF	O-MTR-61-116/GP	23480RC		480		47				8	PL2847
5HR	O-MTR-61-DPB	43180GR		1800		87				1/0	PL4100
4DR	O-JB-292-4141	0358RC		28		27				12	PL4111
4MR	O-JB-292-4141	0358RC		28		28				12	PL4120
3DR	O-JB-292-4141	0358RC		18		24				12	PL4127
3HR	O-JB-61-B	03150RC		150		33				10	PL4131

Incomplete Data
Not Evaluated

Form GO-3.08.1 Rev. 2 SL-F647 04/84

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Tabulation of Non-1E Power Circuits Located in Category 1 Structures
Prepared R. Supkar Date 1-29-90 Checked J Bates Date 1/29/90 1/29/90

O-MCC-61-1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		MCP		(A)		FH	MFR	MODEL	RATING		
5BF	O-TB-61-C	0322RC		22		29				12	PL4157
6BF	O-TB-61-C	0322RC		22		29				12	PL4158

Incomplete Data - Not Evaluated

Sources:

1. W 1458F09 Contract # 73C62-54114-1
2. TELAS (Node 363)
3. Walkdown data Jan 1990
4. CCRS

Form GO-3.08.1 Rev. 2 SL-F647 04/84

EEB-MS-TI15-0011 RO Page H19 of H72

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchert / Emajmudar Date 1/22/90 / 1/16/90 Checked Emajmudar / R.H. Buchert Date 1/26/90 / 1/21/90

COMPT NO	SERVICE	BKR TYPE EF3-	SET POS	TRIP RATING (A)	STR SIZE	DL HTR CAT # G30	SECONDARY PROTECTION MFR	MODEL	RATING	CABLE SIZE	CABLE NO
O-MCC-207-A /4F1	O-SW-31-API	B020	N/A	WP Y 20	# N62	97-2 N/A	←	N/A	→	8	PL6140
O-MCC-218-1 /2F2	O-SW-39-5	B040	N/A	Y 40		N/A	←	N/A	→	10	PL1360
/6D	O-MTR-2-236	L050	4	N 330		T50	←	N/A	→	8	PL1370
O-MCC-257-A /4F1	O-XSW-250-2	B060	N/A	Y 60		No SECONDARY PROTECTION INFO. AVAILABLE.				4	PL6281
/4A	O-LAC-233-160	B050	N/A	Y 50						4	L681
/4C1	O-SW-257-SAS	B020	N/A	Y 20						10	PL4407

45W740-1, R11

45W745, R12

Form GO-3.08.1 Rev. 2 SL-F647 04/84

WBN EEB-MS-TI15-0011 R0 Page H20 of H72

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchart Date 1/22/90 Checked kmaghundar Date 1/26/90
R.H. Buchart 1/17/90 kmaghundar 1/25/90

O-MCC-208-A

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2A	1-MTR-44-90	A025	2	Y105	1	T38	←	N/A	→	10	PL841
2B	1-MTR-44-45	A025	2	Y105	1	T38	←	N/A	→	10	PL845
2C	1-MTR-77-410	A025	LO	Y75	1	T38	1	TRS-30	Y 30A	10X3	1PL1480
2E2	0-PNL-271-STED	B030	N/A	Y30	←			N/A	→	8	PL975
2F1	0-HST-271-AB7	B040	N/A	Y40	←			N/A	→	6X2	PL903
2F2	0-PO-208-STED	B100	N/A	Y100	←			N/A	→	2	PL965
3A	2-MTR-44-90	A025	2	Y105	1	T38	←	N/A	→	10	PL843
3B	2-MTR-44-45	A025	2	Y105	1	T38	←	N/A	→	10	PL847
3C1	0-PMP-44-005	B020	N/A	Y20	←			N/A	→	6	PL3060
3E1	0-HTR-29-CB1	B020	N/A	Y20	←			N/A	→	10	PL960
3E2	0-HST-271-AB3	B030	N/A	Y30	←			N/A	→	8	PL900
3F1	0-XSW-253-1	B020	N/A	Y20	←			N/A	→	10	PL887
3F2	0-MTR-30-STED	B040	N/A	Y40	←			N/A	→	6	PL970
4A	0-MTR-30-244J	A010	4	Y58	1	T34	←	N/A	→	10	PL854
4B	0-MTR-30-246J	A010	4	Y58	1	T34	←	N/A	→	10	PL859
4D2	0-DXF-31-A/B	B030	N/A	Y30	←			N/A	→	8	PL807
4E1	0-HST-271-AB6	B020	N/A	Y20	←			N/A	→	10	PL849
4E2	0-LAC-233-33	B050	N/A	Y50	←			N/A	→	2/0	PL801
4F1	0-XSW-253-2	B020	N/A	Y20	←			N/A	→	10	PL893
4F2	0-HST-271-AB9	B040	N/A	Y40	←			N/A	→	6	PL904
5A	1-MTR-77-411	A025	LO	Y75	1	T38	1	TRS-30	Y 30A	10	1PL4190
5C	0-LS-31-369 0-FSV-31-366	B015	N/A	Y15	←			N/A	→	12	PL957
5E1	0-HST-271-AB8	B020	N/A	Y20	←			N/A	→	10	PL914
5E2	0-LAC-233-61	B100	N/A	Y100	←			N/A	→	1/0	PL867
5F2	0-HST-271-AB10	B040	N/A	Y40	←			N/A	→	6	PL912
6A	2-MTR-77-410	A025	LO	Y75	1	T38	1	TRS-30	N 30A	12	2PL6481
6B	2-MTR-77-411	A025	LO	Y75	1	T38	1	TRS-30	N 30A	12X2	2PL6491
6C	1-MTR-318-A1	A010	4	Y58	1	T34	←	N/A	→	12	1PL6780
6D	1-MTR-31-437-C/1	A003	HI	Y21	1	T22	←	N/A	→	12	1PL6800
6E1	0-XSW-250-1	B020	N/A	Y20	←			N/A	→	10	PL870
6E2	0-HST-271-AB11	B030	N/A	Y30	←			N/A	→	8	PL905

BN EEB-MS-TI15-0011 RO

Calculation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R. H. Bachert Date 1/22/90 Checked [illegible] Date 1/26/90
R. H. Bachert 1/17/90 [illegible] 1/25/90
L. Bates 2/5/90 R Sivakar 2-5-90

O-MCC-208-A

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO.
		EF3-		(A)		G30	MFR	MODEL	RATING		
6F2	O-HST-271-AB12	B040	N/A	Y40		N/A	←	N/A	→	6	PL917
7A	1 HTR-31-397	L050	HIGH	N470	2	T47	←	N/A	→	10	PL921
7C	O-MTR-31-452	H050	4	N565	2	T52	←	N/A	→	6	PL943
7D	O-MTR-31-455	H050	LO	Y320	2	T52	←	N/A	→	6	PL20
7E1	O-CHGR-240-1	B020	N/A	Y20		N/A	←	N/A	→	10	PL875
7E2	O-HST-271-AB13	B030	N/A	Y30		N/A	←	N/A	→	8	PL907
7F1	O-HST-271-AB14	B030	N/A	Y30		N/A	←	N/A	→	8X2	PL906
7F2	O-LAC-233-80	B050	N/A	Y50		N/A	←	N/A	→	6	PL803
8A	O-MTR-31-APA	A005	HIGH	Y41		N/A	←	N/A	→	12 12	PL812 PL2080
8B	2-MTR-31-397	A025Z	HIGH	210N	1	T47	←	N/A	→	10	PL925
8C	2-MTR-31-396	A025Z	HIGH	N210	1	T47	←	N/A	→	10	PL930
8D	1-MTR-31-396	A025Z	HIGH	N210	1	T47	←	N/A	→	10	PL934
8E	O-MTR-31-BPB	A005	4	29Y		N/A	←	N/A	→	12 12	PL816 PL2082
8F1	O-MTR-31-APOC	B020	N/A	20Y		N/A	←	N/A	→	10	PL822
8F2	O-MTR-31-BPOC	B020	N/A	20Y		N/A	←	N/A	→	10	PL820
9D1	O-LAC-233-90	B040	N/A	40Y		N/A	←	N/A	→	8	PL3105
9D2	O-LAC-233-91	B040	N/A	40Y		N/A	←	N/A	→	4	PL3106
9E1	O-LAC-233-92	B040	N/A	40Y		N/A	←	N/A	→	2	PL3107
9E2	O-LAC-233-93	B040	N/A	40Y		N/A	←	N/A	→	2	PL3108
9F1	O-LAC-233-94	B040	N/A	40Y		N/A	←	N/A	→	4	PL3109
6F1	O-HTR-271-STED	B050	N/A	50Y		N/A	←	N/A	→	6	PL980

EEB-MS-TI15-0011 RO
Validation of Non-1E Power Circuits Located in Category 1 Structures

Prepared: R.H. Buchart Date 1/22/90
R.H. Buchart 1/19/90
H.L. Bates 2/5/90

Checked: [illegible] Date 1/26/90
[illegible] 1/25/90
R. Sumlar 2-5-90

O-MCC-208-B

COMP NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION MFR	SECONDARY PROTECTION MODEL	SECONDARY PROTECTION RATING	CABLE SIZE	CABLE NO
		EF3-		(A)		G30					
2A	O-HST-271-HA	A025	3	Y125	1	T40 T40	←	N/A	→	10	PL1100 PL1101
2C	O-HST-271-HB	A025	3	Y125	1	T47 T40	←	N/A	→	10	PL1110 PL1111
2E1	O-HTR-271-ABUD	B030	N/A	Y30		N/A	←	N/A	→	8	PL1172
2F2	O-HST-271-AB15	B050	N/A	Y50		N/A	←	N/A	→	6	PL3840
3A	O-HST-271-HC	A025	3	Y125	1	T47 T40	←	N/A	→	10	PL1150 PL1151
3E1	O-HTR-271-ABUC	B030	N/A	Y30		N/A	←	N/A	→	8	PL1176
3F2	O-PO-208-B4	B070	N/A	Y70		N/A	←	N/A	→	2	PL3760
4A	O-MTR-61-120A	A010	HI	Y84	1	T28	←	N/A	→	10	PL1120
4B	O-MTR-61-112F	A003	HI	Y21	1	T18	←	N/A	→	12	PL1124
4F1	O-PKG-59-B	B040	N/A	Y40		N/A	←	N/A	→	6	PL3789
5A	1-MTR-87-26	A025	3	Y125	1	T39	←	N/A	→	10	
5E2	1-ACU-31-B	B050	N/A	Y50		N/A	←	N/A	→	6	PL3844
5F2	1-ACU-31-C	B100	N/A	Y100		N/A	←	N/A	→	2	PL3848
6A	2-MTR-77-262A	A025	LO	Y75	1	T38	←	N/A	→	10	PL3820
										6	
										14	IPL6813
6E1	1-HTR-31-PASF	B020	N/A	Y20		N/A	←	N/A	→	8	IPL6794
6F2	1-ACU-31-IRS	B030	↓	Y30		↓	FUSE INFO. NOT AVAILABLE.		W30A	8	PL3847
7B	1-MTR-77-262A	A025	LO	Y75	1	T30	←	N/A	→	10	
7E1	1-HTR-271-AEE,AEN	B020	N/A	Y20		N/A	←	N/A	→	10	PL1189
7E2	O-HTR-271-ABUJ	B040		Y40			←	N/A	→	6	PL1204
7F1	2-HTR-271-AEB,AED	B030		Y30			←	N/A	→	8	PL1209
7F2	O-PO-208-B1,B2,B3	B100	↓	Y100		↓	←	N/A	→	8	PL1210,11
8B	O-MTR-61-86	H050	HI	N670	3	T50	←	N/A	→	2	PL3780
8D	O-MTR-61-87	H050	HI	N670	3	T50	←	N/A	→	2	PL3783,3469
8F1	O-HTR-271-AEC,AEJ	B030	N/A	Y30		N/A	←	N/A	→	6	PL1129
8F2	O-HTR-271-AB/RR	B030	N/A	Y30		N/A	←	N/A	→	6	PL1132
9B	O-MTR-61-88	H050	3	Y475	3	T50	←	N/A	→	6	PL1184
9F2	1-MTR-271-AEJ	B030	N/A	Y30		N/A	←	N/A	→	8	PL1160
10A	2-MTR-31-318-B2	L050	3	Y260	2	N/A	←	N/A	→	8	PL1135
						T50	←	N/A	→	6	PL1180
						N/A	←	N/A	→	8	PL1180
						T48	←	N/A	→	8	2PL6795

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Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R. H. Bucket Date 1/22/90 Checked kmaghmyder Date 1/26/90
R. H. Bucket 1/17/90 kmaghmyder 1/25/90

O-MCC-208-B

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO.
		EF3-		(A)		G30	MFR	MODEL	RATING		
10D	Spare Glycol Chiller	FJB-B200	HL	Y 2000 (45WTH4-4 R11-5-L.)		N/A	N/A	N/A	N/A	4/0	PL2890
11A	O-MD-271-A112	EF3-A025Z	2	Y105		T38	←	N/A	→	10	PL1220
5F1	O-SW-253-1	B040	N/A	Y40		N/A	N/A	N/A	N/A	8	PL6284
6D	O-CRN-271-RR6A	B040	N/A	Y40		N/A	←	N/A	→	6	PL1142

See p. 449, 450 & 451 of study # DC128UE2

450744-4

ON EEB-MS-TI15-0011 RO
ulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchert Date 1/22/90 Checked Engineer Date 1/27/90
R.H. Buchert 1/17/90 Bromnelley 1/25/90
R.L. Bates 2/5/90 R Suphar 2-5-90

O-MCC-208-C

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2A	O-HST-271-HD	A025	3	Y125	1	T47	N/A	N/A	N/A	10	PL2920
						T40				10	PL2921
2C	O-HST-271-HE	A025	3	Y125	1	T47	N/A	N/A	N/A	10	PL2930
						T40				10	PL2931
2E2	1-ACU-31-A	B040	N/A	Y40		N/A	N/A	N/A	N/A	6	PL3937
2F1	2-ACU-31-A	B040	N/A	Y40		N/A	N/A	N/A	N/A	6	PL2857
3A	O-HST-271-HF	A025	3	Y125	1	T47	N/A	N/A	N/A	10	PL2940
						T40				10	PL2941
3E1	O-HTR-271-AB/RR2	B020	N/A	Y20		N/A	N/A	N/A	N/A	10	PL2860
3E2	O-HTR-271-ABUI	B040	N/A	Y40		N/A	N/A	N/A	N/A	6	PL2900
3F2	O-IAC-220-259	B100	N/A	Y100		N/A	N/A	N/A	N/A	4	PL2855
4A	O-MTR-61-120B	A010	LO	Y27	1	T28	← N/A →			10	PL2820
4B	O-MTR-61-112G	A003	3	Y12	1	T18	← N/A →			12	PL2824
4E2	O-CRN-77-1A	B050	N/A	Y50		N/A	← N/A →			6	PL3960
4F1	O-HTR-271-AEA, AEC	B040	N/A	Y40		N/A	← N/A →			8	PL2904
5A	2-MTR-77-262B	A025	LO	Y75	1	T38	← N/A →			8	PL2905,06
5F2	O-PO-208-C1→C4	B100	N/A	Y100		N/A	← N/A →			10	PL3930
6E1	O-PO-77-AHUC	B020	N/A	Y20	CONDUIT	N/A	← N/A →			2	PL3971
6F1	O-CHL-61-120	B020	N/A	Y20		N/A	← N/A →			10	PL2909
7A	1-MTR-77-262B	A025	LO	Y75	1	T38	← N/A →			10	PL3905
7C1	2-ACU-31-IRS	B030	N/A	Y30		N/A	FUSE INFO. NOT AVAILABLE		30A	10	PL3955
7E1	1-HTR-271-AEF, AEG	B020		Y20			← N/A →			8	2PL6794
7E2	1-HTR-271-AEK, AEL	B030		Y30			← N/A →			8	PL2880
7F1	2-HTR-31-PASF	B020		Y20			← N/A →			8	PL2888
7F2	O-PO-208-C5→C8	B100		Y100			← N/A →			14	2PL6813
8A	O-MTR-61-80	A025	LO	Y75	1	T38	← N/A →			2	PL3940
8B	O-MTR-61-83	H050	2	Y400	3	T50	← N/A →			10	PL2850
8D	O-MTR-61-84	H050	2	Y400	3	T50	← N/A →			6	PL2828
8F1	O-HTR-271-ABUA	B030	N/A	Y30		N/A	← N/A →			6	PL2831
8F2	O-HTR-271-ABUB	B030	N/A	Y30		N/A	← N/A →			8	PL2875
9B	O-MTR-61-85	H050	2	Y400	3	T50	← N/A →			8	PL2870
9E2	HTR-271-AED AEA	B030	N/A	Y30		N/A	← N/A →			6	PL2834
										8	PL2896

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Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R. H. Buchert Date 1/22/90 Checked [illegible] Date 1/27/90

R. H. Buchert 1/17/90 [illegible] 1/25/90

O-MCC-208-C

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
10A	2-MTR-31-318/B2	L050	3	Y 260		T48	←	N/A	→	8	2PL6795
10B	2-MTR-31-318/A2	A010	4	Y 58		T34	←	N/A	→	12	2PL6780
10C	0-MTR-257-1	A003	3	Y 12		T19	←	N/A	→	12	PL3925
10E	2-MTR-31-437/C2	A003Z	HI	Y 21		T22	←	N/A	→	12	2PL6800
11C	0-HTR-31-479	B050	N/A	Y 50		N/A	←	N/A	→	6	PL6001
6F2	0-CHGR-236-5	B100	N/A	Y 100	N/A	N/A	N/A	N/A	N/A	2	PL3900
9A	2-MTR-87-26	A025Z	HI	N 210		T40	←	N/A	→	10	ABN2023

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Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchert Date 1/22/90 Checked [illegible] Date 1/27/90
R.H. Buchert 1/10/90 Scott Kelley 1/25/90

O-MCC-215-C2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		GE TED		(A)		G30	MFR	MODEL	RATING		
BN-	O-HTR-30-32	136YT 150	N/A	150	N/A	N/A	1	A4J15	Y 15A	12	PL3274
BR-	O-HTR-30-315	136YT 150	N/A	150	N/A	N/A	1	A4J15	Y 15A	12	PL3272
CA-	O-MTR-30-329	136YT 150	N/A	150	1	C0.97A	1	TRS1R	Y 1A	12X2	PL3308
CN-	O-HTR-30-317	136YT 150	N/A	150	N/A	N/A	1	A4J30	Y 30A	8	PL3270
CR	O-HTR-30-322	136YT 150	N/A	150	N/A	N/A	1	A4J30	Y 30A	8	PL3275
CU	O-HTR-30-325	136YT 150	N/A	150	N/A	N/A	1	A4J15	Y 15A	12	PL3278
CX	O-HTR-30-324	136YT 150	N/A	150	N/A	N/A	1	A4J15	Y 15A	12	PL3277
DR	O-MTR-82-320	N/A	N/A	N/A	1	C8.67A	1	TRS 9R PRIM. PROT.	Y 9A	12	PL3269
DU	O-MTR-82-321	N/A	N/A	N/A	1	C8.67A	1	TRS 9R PRIM. PROT.	Y 9A	12	PL3268
EA	O-SW-30-327	N/A	N/A	N/A	1	C148A	1	TRS-G/10 PRIM. PROT.	Y 1.6A	12	PL3316
EE	O-TB-82-C1-S	N/A	N/A	N/A	1	C695A	1	TRS 10R PRIM. PROT.	Y 10A	12	PL3267
FS	O-PO-215-12	136YT 150	N/A	150	N/A	N/A	1	A4J40	Y 40A	4	PL3286
FW	O-PO-215-13	136YT 150	N/A	150	N/A	N/A	1	A4J60	Y 60A	4	PL3287
GA	O-HTR-30-318	136YT 150	N/A	150	N/A	N/A	1	A4J15	Y 15A	12	PL3271
GD	O-HTR 30-320	136YT 150	N/A	150	N/A	N/A	1	A4J15	Y 15A	12	PL3273
GG	O-HTR-30-323	136YT 150	N/A	150	N/A	N/A	1	A4J15	Y 15A	12	PL3276

bulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchert Date 1/22/90 Checked [illegible] Date 1/27/90
R.H. Buchert 1/10/90
Gilbato 2/5/90
Dwa Kelley 1/25/90
R Supkar 2-5-90

O-MCC-215-C2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
							MFR	MODEL	RATING		
		GE TED		(A)		G30					
GK	O-JB-287-4784	136Y T150	N/A	150	N/A	N/A	1	A4J90	Y 90A	2 2	PL3280 PL3281 thru PL3285
GR	O-HTR-30-326	136Y T150	N/A	150	N/A	N/A	1	A4J20	Y 20A	12	PL3279

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Prepared R.H. Burchett 1/17/90 Date 1/22/90 Checked R.H. Burchett 4/21/90 Date 1/26/90

O-MCC-216-A

COMP-NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2A	0-MTR-77-38	A010	HI	Y84	1	T33	←	N/A	→	10	PLR1
2B	0-MTR-40-64A	A010	HI	Y84	1	T34	←	N/A	→	10X2	PLR540
2C	1-MTR-40-354	A025Z	2	Y105	1	T37	←	N/A	→	8	IPL6840
2D	0-DXF-216-A	B020	N/A	Y20		N/A	←	N/A	→	10	PLR560
3A	0-MTR-77-11A	A010	4	Y58	1	T32	←	N/A	→	10	PLR440
3B	0-MTR-77-179	A010	HI	Y84	1	T32	←	N/A	→	10	PLR175
3C	2-MTR-40-14A	A025Z	LO	Y75	1	T38	←	N/A	→	10	PLR470
3D	0-MTR-77-307	L050	2	Y210	2	T47	←	N/A	→	8	PLR180
3F2	1-HTR-271-PT1	B030	N/A	Y30		N/A	←	N/A	→	8	PLR500
4A	0-MTR-77-133A	A010	4	Y58	1	T34	←	N/A	→	10	PLR84
4B	0-MTR-77-32	A010	HI	Y84	1	T32	←	N/A	→	10	PLR90
4E	1-MTR-41-9	A025Z	2	Y105	1	T37	←	N/A	→	8	IPL5380
4F	1-HST-78-W2	B020	N/A	Y20		N/A	SHAW-MUT	TRS-30	Y30	10	PLR200
5A	0-MTR-70-79	A010	HI	Y84	1	T28	←	N/A	→	12	PLR158
5E	1-MTR-41-12	A025Z	2	Y105	1	T37	←	N/A	→	8	IPL5381
5F1	1-HST-78-W1	B020	N/A	Y20		N/A	←	N/A	→	10	PLR125
6A	0-MTR-77-141	A010	4	Y58	1	T38	←	N/A	→	10	PLR106
6B	0-MTR-78-1	A010	HI	Y84	1	T38	←	N/A	→	10	PLR52
6C	1-MTR-40-14A	A025Z	LO	Y75	1	T19	←	N/A	→	10	PLR460
6D	1-MTR-41-15	A025Z	2	Y105	1	T37	←	N/A	→	8	IPL5382
6E	1-MTR-41-18	A025Z	2	Y105	1	T37	←	N/A	→	8	IPL5383
8A	0-MTR-30-FREF/1	A010	3	Y45	1	T33	←	N/A	→	10	PLR485
8B	0-MTR-30-FREF/2	A010	3	Y45	1	T33	←	N/A	→	10	PLR486
8C	0-MTR-30-FREF/3	A010	3	Y45	1	T33	←	N/A	→	10	PLR487
8D	0-MTR-30-FREF/4	A010	3	Y45	1	T33	←	N/A	→	10	PLR488
6F1	0-LAC-233-22	B030	N/A	Y30		N/A	←	N/A	→	8X2	PLR555
6F2		B030	N/A	Y30		N/A	←	N/A	→		

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Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Jungbauer Date 1/26/90 Checked R.H. Buchholt Date 1/27/90
R.H. Buchholt 1/17/90 Jungbauer 1/25/90

O-MCC-216-B

COMP-NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	DL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2A	O-MTR-77-40	A010	4	Y58	1	T32	←	N/A	→	10	PLR9
2B	O-MTR-40-64B	A010	HI	Y84	1	T34	←	N/A	→	12x2	PLR548
2C	1-MTR-40-14B	A025Z	LO	Y75	1	T38	←	N/A	→	10	PLR465
2D	O-DXF-216-B	B020	N/A	Y20		N/A	←	N/A	→	10	PLR565
3A	O-MTR-77-11B	A010	4	Y58	1	T32	←	N/A	→	10	PLR448
3B	O-MTR-77-180	A010	HI	Y84	1	T32	←	N/A	→	10	PLR167
3C	2-MTR-40-14B	A025Z	LO	Y75	1	T38	←	N/A	→	10	PLR475
3E	2-MTR-43-354	A005	HI	Y41		N/A	←	N/A	→	8	2PL6840
3F1	O-ELEV-78-1	B020	N/A	Y20		N/A	←	N/A	→	10	PLR290
3F2	2-HTR-271-PT2	B030	N/A	Y30		N/A	←	N/A	→	8	PLR525
4A	O-MTR-77-133B	A010	4	Y58	1	T34	←	N/A	→	10	PLR75
4B	O-MTR-77-143	A010	HI	Y84	1	T32	←	N/A	→	10	PLR100
4E	2-MTR-41-9	A025Z	2	Y105	1	T37	←	N/A	→	8	2PL5380
4F	2-HST-78-W2	B020	N/A	Y20		N/A	SHW	TRS-50	N50	10	PLR260
5A	O-MTR-70-77	A010	HI	Y84	1	T28	←	N/A	→	12	PLR150
5B	2-MTR-41-12	A025Z	2	Y105	1	T37	←	N/A	→	8	2PL5381
5E	O-CRN-78-1	B020	N/A	Y20		N/A	←	N/A	→	10	PLR195
5F1	2-HST-78-W1	B020	N/A	Y20		N/A	←	N/A	→	10	PLR230
6A	O-MTR-77-142	A010	4	Y58	1	T38	←	N/A	→	10	PLR113
6B	O-MTR-77-25	A010	3	Y45	1	T32	←	N/A	→	10	PLR20
6C	O-MTR-77-29	A010	HI	Y84	1	T32	←	N/A	→	10	PLR30
6D	2-MTR-41-15	A025	2	Y105	1	T37	←	N/A	→	8	2PL5382
6E	2-MTR-41-18	A025Z	2	Y105	1	T37	←	N/A	→	8	2PL5383

Calculation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R. H. Bucholt 1/17/90 Date 1/22/90 Checked R. H. Bucholt 1/25/90 Date 1/26/90

O-MCC-217-A

COMP NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2A	O-MTR-62-250	A003	3	Y12	1	T12	← N/A →			12	PL1780
2B	2-HTR-63-131A,131B	B040	N/A	Y40		N/A	← N/A →			6	PL1660
2D	O-MTR-31-451	H050	LO	Y320	2	T52	← N/A →			6	PL950
2E2	O-PNL-62-L1A	B070	N/A	Y70		N/A	← N/A →			4X2	PL1840
2F1	O-CHGR-217-A1, O-PO-217-A1	B020	N/A	Y20		N/A	← N/A →			10	PL1793
2F2	O-HST-271-AB16	B040	N/A	Y40		N/A	← N/A →			6	PL1810
3A	O-MTR-62-251	A005	3	Y22	1	T24	← N/A →			12	PL1785
3B	1-HTR-63-132A,132B	B040	N/A	Y40		N/A	← N/A →			6	PL1672
3D	O-MTR-12-63	L050	3	Y260	2	T49	← N/A →			8	PL1700
3E	1-MTR-62-153	L050	4	N330	2	T51	← N/A →			8	PL1732 CONDUIT
3F1	O-HTR-271-ABUM	B020	N/A	Y20		N/A	← N/A →			10	PL1926
4D	O-MTR-62-211	L050	3	Y260	2	T50	← N/A →			8X2	PL1760
4E	O-MTR-62-155	L050	4	N330	2	T51	← N/A →			8	PL1746 CONDUIT
4F1	1-CHL-43-161	B020	N/A	Y20		N/A	← N/A →			10	PL1800
5A	O-MTR-31-454	H050	2	Y400	2	T52	← N/A →			6	PL30
5E2	O-DXF-234-1/WDS	B030	N/A	Y30		N/A	← N/A →			8	PL1778
5F1	1-CHL-43-156	B020	N/A	Y20		N/A	← N/A →			10	PL1795

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Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Kim Lynn Hulse Date 1/22/90 Checked R. H. Buchart Date 1/26/90
R. H. Buchart 1/17/90 Kim Lynn Hulse 1/25/90

O-MCC-217-B

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2B	2-HTR-63-131A,131B	B040	N/A	Y40	2(?)	N/A	←	N/A	→	6	PL1680
2C	2-MTR-31-398	A010	4	Y58	1	T32	←	N/A	→	10	PL1817
2D	0-MTR-62-148	H050	2	Y400	2	T52	←	N/A	→	6	PL1725
2E1	0-HST-271-AB18	B040	N/A	Y40		N/A	←	N/A	→	6	PL1830
2E2	0-PNL-62-L1B	B070	N/A	Y70		N/A	←	N/A	→	4	PL1880
2F1	0-HTR-271-ABUK	B020	N/A	Y20		N/A	←	N/A	→	10	PL1920
2F2	0-HST-271-AB19	B040	N/A	Y40		N/A	←	N/A	→	6	PL1820
3B	2-HTR-63-132A,B	B040	N/A	Y40		N/A	←	N/A	→	6	PL1692
3C	1-MTR-31-398	A010	4	Y58	1	T38	←	N/A	→	10	PL1812
3D	0-MTR-12-68	L050	3	Y260	2	T48	←	N/A	→	8	PL1711 CONDUIT
3E	2-MTR-62-153	L050	3	Y260	2	T51	←	N/A	→	8	PL1739
3F1	0-HTR-271-ABUL	B020	N/A	Y20		N/A	←	N/A	→	10	PL1923 CONDUIT
3F2	0-HST-271-AB20	B040	N/A	Y40		N/A	←	N/A	→	6	PL1825
4D	0-MTR-62-213	L050	3	Y260	2	T50	←	N/A	→	8	PL1768
4F1	2-CHL-43-161	B020	N/A	Y20		N/A	←	N/A	→	10	PL1803
5E1	0-HST-271-AB21	B040	↓	Y40		↓	←	N/A	→	6	PL1835 CONDUIT
5E2	0-DXF-234-2/WDS	B020		Y20			←	N/A	→	10	PL1755
5F1	2-CHL-43-156	B020		Y20			←	N/A	→	10	PL1798

N EEB-MS- TI15-0011 RO

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Kmgahrdar Date 1/22/90 Checked R.H. Buchart Date 1/26/90
R.H. Buchart 1/17/90 Kmgahrdar 1/25/90

O-MCC-226-1

COMP NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO.
		EF3-		(A)		G30	MFR	MODEL	RATING		
2B	O-MTR-30-709B	A010	2	Y36	1	T29/T30	←	None	→	10	PLW365
2C	O-FCV-27-101	A005	3	Y22	1	T24				10	PLW515
2D	O-MTR-30-714B	A010	3	Y45	1	N/A				10	PLW360
2F1	O-HTR-30-710	B020	N/A	Y20		N/A				10	PLW393
2F2	O-PO-226-1,2,3	B100	N/A	Y100		N/A	in	conduit		4 2	PLW431 PLW432
3A	O-FCV-27-97	A005	3	Y22	1	N/A	←	None	→	6	PLW500
3B	O-MTR-40-10A	A010	4	Y58	1	T30	in	conduit		12	PLW420
3D	O-MTR-40-10B	A010	4	Y58	1	N/A				12	PLW425
3E1	O-HTR-30-712	B020	N/A	Y20		N/A				4	PLW400
3E2	O-DPL-226-1	B050	N/A	Y50		N/A	←	None	→	4	PLW465
3F1	O-HTR-30-711	B020	N/A	Y20		N/A				10	PLW436
3F2	O-PO-226-4,5,6	B100	N/A	Y100		N/A				2	PLW434
4B	O-MTR-30-709A	A010	2	Y36	1	N/A				10	PLW378
4C	O-HTR-30-714	FJ3-B200	LO	Y960		N/A				4/0	PLW403
4F1	O-LAC-233-34	B050	N/A	Y50						2	L34
4F2	O-PO-226-7,8,9	B100	N/A	Y100						2+2	PLW437 PLW438
5A	O-MTR-30-714A	A010	3	Y45	1	N/A				10	PLW375
5B	O-FCV-27-100	A005	3	Y22	1	N/A				10	PLW508
5C	O-HTR-30-708	FJ3-B100	LO	Y750		N/A				2	PLW415
5F2	O-HTR-30-713	B020	N/A	Y20		N/A				10	PLW384
6A	O-MTR-30-708B	A010	2	Y36	1	T29/T30				10	PLW370
6B	O-MTR-30-708A	A010	2	Y36	1	N/A				10	PLW381
6C	O-HTR-30-709	FJ3-B100	LO	Y750		N/A				2	PLW409
6E1	O-MTR-40-5	B020	N/A	Y20		N/A				10	PLW480
6F1	O-HTR-30-716S	B020	N/A	Y20		N/A	in	conduit		10	PLW387
6F2	O-HTR-30-71	B020	N/A	Y20		N/A				10	PLW390
7A	O-CRN-270-11	FJ3-B200	LO	Y960		N/A				4/0	PLW470
7F1	O-MTR-40-68	B020	N/A	Y20		N/A	←	None	→	10	PLW490
7F2	O-LAC-226-32	B070	N/A	Y70		N/A	←	None	→	4	PLW425
5F1	LC 36	B020	N/A	Y20		N/A				6	L29
										10	RM700

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Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchat Date 1/22/90 Checked [signature] Date 1/26/90
R.H. Buchat 1/17/90 [signature] 1/25/90

O-MCC-249-1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2A	O-MTR-249-HS54	A010	4	Y 58		T34	←	N/A	→	10	PLR965
2B	O-MTR-249-HS55	A010	4	Y 58		T34	←	N/A	→	10	PLR970
2D	O-MTR-249-HS33	FJ3 -A225	2	Y 1200*		T60	←	N/A	→	1/0	PLR790
2F1	O-HST-249-1	B030	N/A	Y 30	N/A	N/A	←	N/A	→	8	PLR952
2F2	O-ACU-249-B	B050	N/A	Y 50	N/A	N/A	←	N/A	→	6	PLR920
3A	O-MTR-249-HS12	A010	Hi	Y 84		T29	←	N/A	→	10	PLR785
3B	O-MTR-249-HS11	A010	Hi	Y 84		T29	←	N/A	→	10	PLR780
3F2	O-HTR-249-WH	B050	N/A	Y 50	N/A	N/A	←	N/A	→	6	PLR946
4A	O-MTR-249-HS20	A030	4	Y 170 (45W748 R2 S-L)		T41	←	N/A	→	10	PLR800
4B	O-MTR-249-HS22	A030	4	Y 170 (45W748 R2 S-L)		T41	←	N/A	→	10	PLR805
4F2	O-HST-249-2	B040	N/A	Y 40	N/A	N/A	←	N/A	→	6	PLR950
5D1	O-MTR-249-CDWE /SF	B040	N/A	Y 40	N/A	N/A	←	N/A	→	10	PLR948
5D2	O-MTR-249-CDWE /EF	B040	N/A	Y 40	N/A	N/A	←	N/A	→	10	PLR944
5E2	O-ACU-249-A	B070	N/A	Y 70	N/A	N/A	←	N/A	→	4	PLR936
5F1	O-HTR-249-A	B030	N/A	Y 30	N/A	N/A	←	N/A	→	8	PLR933
5F2	O-HTR-249-B	B030	N/A	Y 30	N/A	N/A	←	N/A	→	8	PLR928

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Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchert Date 1/22/90 Checked [illegible] Date 1/26/90
R.H. Buchert 1/17/90 [illegible] 1/25/90

O-MCC-249-1

COMPT NO	SERVICE	BKR TYPE EF3-	SET POS	TRIP RATING (A)	STR SIZE	OL HTR CAT # G30	SECONDARY PROTECTION MFR	MODEL	RATING	CABLE SIZE	CABLE NO
6A	O-MTR-249-HS60	A003	LO	Y 7		T23	← N/A →			10	PLR43
6C	O-MTR-249-HS34	A010	4	Y 5B		T32	← N/A →			10	PLR795
6E1	O-HTR-249-C	B020	N/A	Y 20	N/A	N/A	← N/A →			10	PLR925
6F1	O-PO-249-1	B100	N/A	Y 100	N/A	N/A	← N/A →			2	PLR910
8A1	O-HST-249-3	B040	N/A	Y 40	N/A	N/A	← N/A →			6	PLR942
8B1	O-HST-249-4	B030	N/A	Y 30	N/A	N/A	← N/A →			8	PLR940
8C	O-MTR-249-HS57	FJ3 -A225	2	Y 1200*		T60	← N/A →			1/0	PLR960
8E	O-MTR 249-HS56	FJ3 -A225	2	Y 1200*		T60	← N/A →			1/0	PLR965

* ITE CIRCUIT BKR DATA FROM VENDOR MANUAL.

N EEB-MS-TI15-0011 RO

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmaghnadar Date 1/22/90 Checked R.H. Buchart Date 1/26/90
kmaghnadar 1/16/90 R.A. Buchart 1/25/90

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
1-MCC-209-A /6F1	0-XSW-250-2	B060	N/A	Y60		N/A	←	N/A	→	4	PL6280
/7D	1-FCV-3-253	A025	3	Y125		T42	←	N/A	→	10	1V4649
/10C	1-FCV-3-250	A025	3	Y125		T42	←	N/A	→	10	1V4640
/13E	1-FCV-3-251	A025	3	Y125		T42	←	N/A	→	10	1V4643
1-MCC-209-C /3F2	1-DXF-264-1	B100	N/A	Y100		N/A	←	N/A	→	2	1PL6660
1-MCC-210-A /2D	1-FCV-3-252	A025	3	Y125	1	T42	←	N/A	→	10	1V4646
/2F2	1-PO-210-A4	B030	N/A	Y30	N/A	N/A	←	N/A	→	8	1PL1195
/3F2	1-SW-210-A/3F2	A100	HI	N1125	—	N/A	←	N/A	→	2	PL6143
	45W753-2,3 R12,8										
	45W753 6,R10										
	45W757-1,2 R16,10										

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Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared GS Bates Date 2/5/90 Checked R. Supkar Date 2-5-90

1-DPL-68-341 H

COMPT NO	SERVICE	BKR MODEL NO	SENSOR RATING (A)	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
	Pressurizer Htr Group C	Y KJL100	100						JJS225	1/0	1PL6430 1PL6431 1PL6432 1PL6433 1PL6434 1PL6435
										1/0	1PL4702 1PL4703 1PL4704 1PL4705 1PL4706 1PL4707
										2	1PL4710 1PL4711 1PL4712 1PL4713 1PL4714 1PL4715

WBN EEB-MS-TI15-0011 RO Page H358 of H72

Calculation of Non-1E Power Circuits Located in Category 1 Structures

Prepared M Bate Date 2/5/90 Checked R Sripkar Date 2-5-90

1-DPL-68-341F

COMPT No	SERVICE	BKR MODEL NO	SENSOR RATING (A)	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
	Pressurizer Htr Group D	XJL400Y	100						JJS225Y	1/0	1PL6410
		↓							↓	↓	1PL6411
											1PL6412
											1PL6413
											1PL6414
											1PL6415
										1/0	1PL4655
											1PL4656
											1PL4657
											1PL4658
										↓	1PL4659
											1PL4660
									Y	2	1PL4661
									↓		1PL4662
											1PL4663
											1PL4664
											1PL4665
										↓	1PL4666

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Installation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R. H. Buchart Date 1/22/90 Checked [signature] Date 1/26/90
[signature] 1/16/90 R. H. Buchart 1/25/90
[signature] 2/5/90 R. Slupka 2/5/90

1-MCC-213-A1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
16A	1-PENT-293-32	A010	3	Y 45 Y	1	T32	SHAW-MUT	TRS-30	Y 30A N	10 12	1PL6300 1PL6301
16B	1-PENT-293-24	A010	LO	Y 27 Y	1	T27	SHAW-MUT	TRS-30	Y 30A N	10 12	1PL6268 1PL6269
16F1	O-XSW-252-1	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	1PL6040
16F2	1-TB-31-303/2	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10X2	1PL6289
17A	O-JB-292-2051	B030	N/A	Y 30	2	N/A	N/A	N/A	N/A	8 12 12	1PL6208 1PL6209 1PL6210
17E	1-PENT-293-32	B100	N/A	Y 100	N/A	N/A	SHAW-MUT	CPGA-197 #2	Y 2/15/90 2/15/90	2 2	1PL6100 1PL6094
17F1	O-XSW-240-5	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	1PL6060
18C	1-MTR-31-303	A010	3	Y 45	1	T32	←	N/A	→	12	1PL6281
18D	O-MTR-62-226	A005	3	Y 22	1	T26	←	N/A	→	12	1PL6265
18F1	O-XSW-250-1	B020	N/A	Y 20 <				N/A	→	10	PL871
18F2	1-JB-293-2859	A100	LO	Y 475	←			N/A	→	2x2 2 2 2 2 2	1PL6093 1PL6101 1PL6102 1PL6103 1PL6104 1PL6106

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ulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmaghmadar Date 1/22/90 Checked R.H. Bucholt Date 1/24/90
kmaghmadar 1/16/90 R.H. Bucholt 1/25/90

1-MCC-213-A2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
4A	1-FCV-3-191	A010	3	Y45	1	T32	←	N/A	→	12	1V3260
4B	1-FCV-3-192	A010	3	Y45	1	T32	←	N/A	→	12	1V3280

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Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchert Date 1/22/90 Checked Engineer Date 1/26/90
R.H. Buchert 1/10/90 Doug Kelley 1/25/90

1-MCC-213-B1

COMPT NO	SERVICE	BKR TYPE EF3-	SET POS	TRIP RATING (A)	STR SIZE	OL HTR CAT # G30	SECONDARY PROTECTION MFR	MODEL	RATING	CABLE SIZE	CABLE NO
3F1	0-XSW-252-2	B020	N/A	Y 20	←		N/A		→	10	1PL6045
16A	1-PENT-293-35	A010	3	Y 45	1	T32	1	TRS30	Y 30A N	10 12	1PL6310 1PL6311
16E	1-PENT-293-47	B100	N/A	Y 100	N/A	N/A	1	CPGA-197 #2	N Y	2 2	1PL6085 1PL6082
16F1	0-XSW-240-5	B020	N/A	Y 20	←	N/A			→	10	1PL6061
17A	0-JB-292-2048	B040	N/A	Y 40 N N	2	←	N/A		→	8 12 12	1PL6214 1PL6215 1PL6216
17E	1-PENT-293-35	B100	N/A	Y 100	N/A	N/A	1	CPLA-197 #2	N Y	2x2 2	1PL6075 1PL6076
17F1	0-XSW-240-1	B020	N/A	Y 20	←		N/A		→	10	PL876
17F2	1-TB-31-324/2	B020	N/A	Y 20	←		N/A		→	10	1PL6291
18C	1-MTR-31-324/1	A010	3	Y 45	1	T32	←	N/A	→	10	1PL6285
18D	0-MTR-84-2	A005	3	Y 22	1	T26	←	N/A	→	12	1PL6273

TMB 3-7-90

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Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchart Date 1/22/90 Checked kmaghrebar Date 1/26/90
R.H. Buchart 1/10/90 kmaghrebar 1/21/90

1-MCC-213-B2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
4A	1-FCV-3-193	A010Z	3	Y45	1	T32	←	N/A	→	12	1V3290
4B	1-FCV-3-194	A010Z	3	Y45	1	T32	←	N/A	→	12X2	1V3270
12A	0-FCV-67-362	B010	LO	Y27	1	T28	←	N/A	→	12	1V3230

3-7-91

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Anaj mudar Date 1/22/90 Checked R.H. Buchert Date 1/26/90
R. H. Buchert 1/10/90 Scott Kelley 1/25/90

1-MCC-214-A1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2D	1-MTR-81-3	H050	2	Y400	3	T52	N/A	N/A	N/A	6	1PL3221
2F1	0-DXF-234-A1/SIS	B020	N/A	Y 20	N/A	N/A	GOULD/SHAWMUT	D15A030*	Y 30A	8	1PL3590
2F2	1-DXF-242-1	B070	N/A	Y 70	N/A	N/A	GOULD/SHAWMUT	D15AB100*	N 100A	4	1PL3596
3F1	1-RE-90-119	B020	N/A	Y 20	N/A	N/A	GOULD/SHAWMUT	D15A030*	N 30A	10	1PL3589
3F2	0-TB-40-3	B020	N/A	Y 20	N/A	N/A	GOULD/SHAWMUT	D15A030*	N 30A	10	1PL3720 ~~1PL3716~~ 2-5470
5F1	0-RE-90-132	B020	N/A	Y 20	N/A	N/A	GOULD/SHAWMUT	D15A030*	N 30A	10	1PL3599
10F1	0-RE-90-101	B020	N/A	Y 20	N/A	N/A	GOULD/SHAWMUT	D15A030*	N 30A	10	1PL3598
12E1	1-PNL-90-L398	B020	N/A	Y 20	N/A	N/A	GOULD/SHAWMUT	D15A030*	N 30A	10	1PL3610
13A	1-MTR-84-16	A005	3	Y 22	1	T25	← N/A →			12	1PL2940
13B	0-MTR-84-6	A005	3	Y 22	1	T25	← N/A →			12	1PL3460
13C	1-MTR-65-77	A025	LO	Y 75	1	T37	← N/A →			12	1PL3645

Shamut D15A & HFCP are the same fuse.

Form GO-3.08.1 Rev. 2 SL-F647 04/84

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Calculation of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmaghnadar Date 1/22/90 Checked D.H. Buchholz Date 1/24/90
kmaghnadar 1/16/90 R.H. Buchholz 1/25/90
GBates 2/5/90 R. Supkar 2-5-90

1-MCC-214-A2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2A	0-MTR-31-339	A003	3	Y12	1	T20	←	N/A	→	12	IPL2830
2D1	1-HTR-30-A1A	B020	N/A	Y20	N/A	N/A	1	DISA030	N 30A	10	IPL3280
2D2	0-PO-214-1	B100	N/A	Y100	N/A	N/A	1	DISAB100	Y 100A	2	IPL2780
2E1	1-HTR-30-B1A	B020	N/A	Y20	N/A	N/A	1	DISA030	N 30A	10	IPL3284
2E2	0-TB-31-493/1	B050Z	N/A	Y50 IN	N/A	N/A	1	DISA050	Y 50A N	6 10	IPL6460 IPL6463,64
2F2	0-PO-214-7	B100	N/A	Y100	N/A	N/A	1	DISAB100	Y 100A	2	IPL2777
3A	1-MTR-30-25	A010	3	Y45	1	T32	←	N/A	→	12x2	IPL2906
3D1	1-HTR-30-ACRD	B020	N/A	Y20	N/A	N/A	1	DISA030	N 30A	10	IPL3266
3D2	0-PO-214-5	B100	N/A	Y100	N/A	N/A	1	DISAB100	Y 100A	2	IPL2775
3E1	1-HTR-30-C1A	B020	N/A	Y20	N/A	N/A	1	DISA030	N 30A	10	IPL3288
3E2	1-HTR-30-D1A	B050Z	N/A	Y50	N/A	N/A	1	DISA050	Y 50A	6	IPL3510
3F1	0-HTR-31-97	B020	N/A	Y20	N/A	N/A	1	DISA030	N 30A	10	IPL2800
3F2	1-HTR-30-1A1	B020	N/A	Y20	N/A	N/A	1	DISA030	N 30A	10	IPL3365
4A	1-MTR-30-283	A005	2	Y18	1	T24	←	N/A	→	12	IPL3621
4B	0-MTR-31-203 /204	A025	3	Y125	1	T44	←	N/A	→	10	V1920
4E1	1-HTR-30-BCRD	B020	N/A	Y20	N/A	N/A	1	DISA030	N 30A.	10	IPL3264

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Calculation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Anyhunder Date 1/22/90 Checked R.H. Bucholt Date 1/26/90
Anyhunder 1/16/90 R.H. Bucholt 1/25/90

1-MCC-214-A2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
4F1	1-HTR-30-CCRD	B020	N/A	Y20	N/A	N/A	1	DISA030	N30A	10	IPL3268
5A	1-MTR-30-301	A010	3	Y45	1	T34	←	N/A	→	12	IPL3435
5E1	0-HTR-31-83	B030	N/A	Y30	N/A	N/A.	1	DISA030	Y30A	8	IPL3707
5F1	1-HTR-30-XM1A	B020	N/A	Y20	N/A	N/A.	1	DISA030	N30A	10	IPL3370
5F2	1-HTR-30-AB1	B020	N/A	Y20	N/A	N/A	1	DISA030	N30A	10	IPL3314
6E1	1-HTR-30-SMS	B030	N/A	Y30	N/A	N/A	1	DISA030	Y30A	8	IPL2811
6E2	1-HTR-30-NM1	B050	N/A	Y50	N/A	N/A.	1	DISA050	Y50A	6	IPL2806
6F2	0-HTR-30-RM1	B020	N/A	Y20	N/A	N/A	1	DISA030	N30A	10	IPL3320
7D2	0-HTR-30-AFH	B040	N/A	Y40	N/A	N/A	1	DISA050	Y50A	6	IPL3335
7E1	1-HTR-30-U1A	B020	N/A	Y20	N/A	N/A.	1	DISA030	N30A	10	IPL2813
7E2	0-HTR-30-BFH	B040	N/A	Y40	N/A	N/A	1	DISA050	Y50A	6	IPL3330
7F2	0-HTR-30-CFH	B040	N/A	Y40	N/A	N/A.	1	DISA050	Y50A	6	IPL3340
8A	1-MTR-30-CRD	FJ3 B125	Hi	Y1600	N/A	N/A	←	N/A	→	2/0	IPL3692
8B	1-HTR-1-CBS	FJ3 B125	4	Y1500	N/A	N/A	←	N/A	→	4/0	IPL3680

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Calculation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Kmajmudar Date 1/22/90 Checked R.H. Buchert Date 1/26/90
R. H. Buchert 1/10/90 Doug Kelley 1/25/90

1-MCC-214-B1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2D	1-MTR-81-7	H050	2	Y400	3	T52	←	N/A	→	6	1PL3228
2F1	0-DXF-234-B1	B020	N/A	Y20	N/A	N/A	1	D15A030	Y30A	8	1PL3740
2F2	0-TB-40-66	B020	N/A	Y20	N/A	N/A	1	D15A030	N30A	10	1PL3730
9F1	1-PNL-55-L236	B020	N/A	Y20	N/A	N/A	1	D15A030	N30A	10	1PL2972
12A	1-MTR-30-181	A010	3	Y45	1	T33	←	N/A	→	10	1PL3021
12E1	0-PNL-90-L397	B020	N/A	Y20	N/A	N/A	1	D15A030	N30A	10	1PL3609
12F1	1-RE-90-99	B020	N/A	Y20	N/A	N/A	1	D15A030	N30A	10	1PL3790
13A	1-MTR-84-21	A005	3	Y22	1	T23	←	N/A	→	12	1PL2948
13B	0-MTR-84-11	A005	3	Y22	1	T24	←	N/A	→	12	1PL3465
13C	1-MTR-65-74	A025	LO	Y75	1	T37	←	N/A	→	12	1PL3660
13F1	0-DXF-234-B4	B020	N/A	Y20	N/A	N/A	1	D15A030	N30A	10	1PL3017

Form GO-3.08.1 Rev. 2 SL-F647 04/84

EEB-MS-TI15-0011 RO
lation of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmaghudar Date 1/22/90 Checked R.H. Buchart Date 1/26/90
R.H. Buchart 1/10/90 Scott Kelley 1/25/90

1-MCC-214-B2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2B	0-MTR-31-418	A005	4	Y29	1	T28	←	N/A	→	12	1PL3654
2E1	1-HTR-30-AIB	B020	N/A	Y20	N/A	N/A	1	N DISA030	30A.	10	1PL3676
2E2	0-HTR-30-GFA	B040	N/A	Y40	N/A	N/A	1	Y DISA050	50A.	6	1PL3400
2F1	1-HTR-30-BIB	B020	N/A	Y20	N/A	N/A	1	N DISA030	30A	10	1PL3898
2F2	1-HTR-31-BRB	B050	N/A	Y50	N/A	N/A	1	Y DISA050	50A	6	1PL3890
3B	1-MTR-30-284	A005	2	Y18	1	T24	←	N/A	→	12	1PL3626
3C	1-MTR-30-66	A005	2	Y18	1	T24	←	N/A	→	12	1PL3631
3E1	1-HTR-30-CIB	B020	N/A	Y20	N/A	N/A	1	N D15A030	30A	10	1PL3895
3E2	0-HTR-30-HFA	B040	N/A	Y40	N/A	N/A	1	Y D15A050	50A	6	1PL3405
3F1	1-HTR-30-PRX	B020	N/A	Y20	N/A	N/A	1	N D15A030	30A.	10	1PL3395
4B	1-MTR-30-302	A010	3	Y45	1	T32	←	N/A	→	12	1PL3438
4E1	0-HTR-31-95	B020	N/A	Y20	N/A	N/A	1	N DISA030	30A	10	1PL2809
4E2	0-HTR-30-NFA	B040	N/A	Y40	N/A	N/A	1	Y DISA050	50A	6	1PL3415
4F1	1-HTR-30-SBU	B020	N/A	Y20	N/A	N/A	1	N DISA030	30A	10	1PL3425
4F2	1-HTR-30-U113	B020	N/A	Y20	N/A	N/A	1	N D15A030	30A	10	1PL2975
5E1	1-HTR-31-87	B020	N/A	Y20	N/A	N/A	1	N DISA030	30A	10	1PL2825

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ulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Amy Mueller Date 1/22/90 Checked R. H. Buchert Date 1/26/90
R. H. Buchert 1/17/90 Brad Holley 1/25/90
GL Bates 2/5/90 R Supkar 2-5-90

1-MCC-214-B2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
5F1	0-HTR-30-RM2	B020	N/A	Y 20	N/A	N/A	1	DISA030	N 30A	10	IPL3385
6B	1-MTR-30-26	A010	3	Y 45	1	T32	←	N/A	→	12	IPL2913
6E1	1-HTR-30-AB7	B020	N/A	Y 20	N/A	N/A	1	DISA030	N 30A	10	IPL3381
6F1	1-HTR-30-T1B	B020	N/A	Y 20	N/A	N/A	1	DISA030	N 30A	10	IPL3430
7D	0-HTR-31-421	FJ3-B225	HI	Y 2000	N/A	N/A	←	N/A	→	300	IPL3440
7E2	0-HTR-31-72	EF3-B030	N/A	Y 30	N/A	N/A	1	DISA030	Y 30A	8	IPL2977
7F1	1-HTR-30-NM2	B050Z	N/A	Y 50	N/A	N/A	1	DISA050	Y 50A	6	IPL3421
8F1	0-TB-31-494	B040	N/A	Y 40	N/A	N/A	1	DISA050	Y 50A N N	6 10 10	IPL6470 IPL6473 IPL6474
8F2	1-PO-214-10	B100	N/A	Y 100	N/A	N/A	1	DISAB100	Y 100A	2	IPL2785
9A	1-MTR-30-CRB	FJ3-B125	LO	Y 750	N/A	N/A	←	N/A	→	4/0	IPL3671

EEB-MS-TI15-0011 RO

ulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared [illegible] Date 1/22/90 Checked R.H. Buchart Date 1/26/90
[illegible] 1/16/90 R.H. Buchart 1/25/90

1-MCC-215-A1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
5A	1-MTR-82-181	A025	LO	Y75	1	T38	←	N/A	→	12	PL2195
5F1	0-HTR-30-479	B020	N/A	Y20	←		N/A		→	10	PL2322
5F2	1-JB-296-256	B100	N/4	Y100	←		N/A		→	2	PL2539
6A	1-SW-30-463	A005	2	Y18	1	T25	←	N/A	→	12	PL2235
6F1	0-HTR-30-483	B020	N/A	Y20	←		N/A		→	10	PL2310

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Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmaghmadar Date 1/22/90 Checked R.H. Bucheit Date 1/26/90
kmaghmadar 1/16/90 R.H. Bucheit 1/25/90

1-MCC-215-A2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2E2	0-HTR-30-484	B040	N/A	Y 40	←		N/A	→		6	PL2304
3E1	1-HTR-30-487	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	PL2411
3F1	1-HTR-30-471	B030	N/A	Y 30	N/A	N/A	N/A	N/A	N/A	8	PL2262
3F2	1-HTR-30-472	B030	N/A	Y 30	N/A	N/A	N/A	N/A	N/A	8	PL2268
5A	1-MTR-82-180	A025Z	LO	Y 75	1	T38	N/A	N/A	N/A	12	PL2200
5E1	0-HTR-30-485	B030	N/A	Y 30	N/A	N/A	N/A	N/A	N/A	8	PL2316
5F1	0-SW-39-37	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	PL2765
6A	0-MTR-30-470	A005	4	Y 29	1	T28	N/A	N/A	N/A	12	PL2572
6D	1-TB-82-A/1-A	B020	N/A	Y 20	1	N/A	N/A	N/A	N/A	12	PL2700
2E2	0-HTR-30-484	B040	N/A	Y 40	N/A	N/A	N/A	N/A	N/A	6	PL2304

BN EEB-MS- TI15-0011 RO

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Kim Lyn Nelson Date 1/22/90 Checked R.H. Buchert Date 1/24/90

R.H. Buchert 1/17/90 Kim Lyn Nelson 1/25/90

1-MCC-215-B1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
5A	1-MTR-82-211	A025	LO	Y 75	1	N/A	N/A	N/A	N/A	12	PL2215
5F1	0-HTR-30-481	B020	N/A	Y 20	NA	N/A	N/A	N/A	N/A	10	PL2340
6A	1-SW-30-465	A005	2	18	1	T26	N/A	N/A	N/A	12	PL2249

CN EEB-MS-TI15-0011 RO
Calculation of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmajmudar Date 1/22/90 Checked R.H. Buchert Date 1/26/90
R. H. Buchert 1/17/90 kmajmudar 1/25/90

1-MCC-215-B2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
3E1	1-HTR-30-489	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	PL2412
3F1	1-HTR-30-473	B030	N/A	Y 30	N/A	N/A	N/A	N/A	N/A	8	PL2274
3F2	1-HTR-30-474	B030	N/A	Y 30	N/A	N/A	N/A	N/A	N/A	8	PL2280
5A	1-MTR-82-210	A025Z	LO	Y 75	1	T38	N/A	N/A	N/A	12	PL2220
5F2	1-JB-296-258	B100	N/A	Y 100	N/A	N/A	N/A	N/A	N/A	2	PL2552
6D	1-TB-82-B/1-B	B020	N/A	Y 20	1	N/A	N/A	N/A	N/A	12	PL2706

WBN EEB-MS- TI15-0011 RO Page H50 of H72

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared KM by GJB Date 1/22/90
KM by GJB 1/16/90
GJ Bates 2/5/90

Checked TBT FOR RHB Date 1-26-90
TBT FOR RAB 1-25-90
R. Supkar 2-5-90

1-MCC-232-A

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	DL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2A	1-PENT-293-24	A010	3	Y45 Y	1	T35	SHAW-MUT	TRS-30	Y30 N	10X2 12	1PL653 1PL654
3A	1-PENT-293-32 FLUX D	B020	N/A	Y20	N/A	N/A	"	DISA030	N30	10x2 10	1PL295 1PL296
3B	1-PENT-293-32 FLUX E	B020	N/A	Y20	N/A	N/A	"	DISA030	N30	10x2 10	1PL300 1PL301
3C	1-PENT-293-32 FLUX F	B020	N/A	Y20	N/A	N/A	"	"	N30	10x2 10	1PL305 1PL306
4D	1-MTR-61-51	L050	4	N330	2	T51	N/A	N/A	N/A	8	1PL4320
4E	1-HTR-61-92	B050	N/A	Y50	-2	T51	N/A	N/A	N/A	6	1PL4300
5A	0-MTR-31-406	A005	4	Y29	1	T28	N/A	N/A	N/A	12	1PL644
6A	0-MTR-31-25	A010	4	Y58	1	T34	N/A	N/A	N/A	12	1PL735
6C	0-MTR-77-91	H050	LO	Y320	2	T52	N/A	N/A	N/A	6x2	1PL5460
6F1	0-SW-234-A/IPS	B030	N/A	Y30	N/A	N/A	SHAW-MUT	DISA030	Y30	1/0	1PL1108
7B	1-PENT-293-32 RCP 1 HTR	A010	2	Y36	1	T36	"	TRS-30	N30	12 12	1PL370 1PL371
7D	1-PENT-293-32 RCP1 LIFT	B040	N/A	Y40	1	T44	"	"	Y30	10 10	1PL396 1PL397
7F2	1-JB-292-994	B100	N/A	Y100	N/A	N/A	SHAW-MUT	DISAB100	Y100	2	1PL258
8B	1-PENT-293-24 RCP 3 HTR	A010	2	Y36	1	T36	"	TRS-30	N30	12x2 12	1PL382 1PL383
8D	1-PENT-293-24 RCP 3 LIFT	A025	3	Y125	1	T45	"	"	Y30	10x2 10	1PL408 1PL409
8F2	1-JB-292-993	B100	N/A	Y100	N/A	N/A	SHAW-MUT	DISAB100	Y100	2	1PL240 241,243

WBN EEB-MS-TI15-0011 R0 Page H51 of H72

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Bucket Date 1/22/90 Checked Engineer Date 1/26/90
Engineer 1/16/90 R.H. Bucket 1/25/90
Z.Bates 2/5/90 R. Supkar 2/5/90

1-MCC-232-A

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
9B	1-PENT-293-32 FAN A	A025	LO	Y 75 Y	1	T40	SHAW-MUT	TRS-30	Y 30 N	10x2 12	1PL520 1PL521
9F2	1-JB-292-1869	B100	N/A	Y 100	N/A	N/A	SHAW-MUT	DISAB100	Y 100	2	1PL250, 251→253
10B	1-PENT-293-24 FAN C	A025	2	Y 105 Y	1	T40	"	TRS-30	Y 30 N	10X2 12	1PL550 1PL551
10F	1-PENT-293-32 STUD	B020	N/A	Y 20 Y	N/A	N/A	"	DL5A030	N 30 N	10 12	1PL270 1PL271
11D	1-PENT-293-24 RCDT A	B030	N/A	Y 30	2	T45	"	TRS-60	Y 60	8 8	1PL485 1PL486
11F	1-PENT-293-32 HTR A	B020	N/A	Y 20	N/A	N/A	"	DL5A030	N 30	10 10	1PL336 1PL337
12F	1-PENT-293-32 HTR A	B020	N/A	Y 20	N/A	N/A	"	"	Y 30	10 10	1PL5440 1PL5441
13A	1-PENT-293-5	B040	N/A	Y 40	N/A	N/A	"	DISA050	Y 50	6	1PL621
13D	1-PENT-293-5	FJ3-B175	HI	1600 N	N/A	N/A	SHAW-MUT	CP6A-14 4/0	Y 2/15/90 RKB Y 2/15/90 RKB	6 4/0x2 2/0	1PL622 1PL820 1PL821
14B	1-PENT-293-5	EF3-A010	2	Y 36	1	T29	"	TRS-30	N 30	12 12	1PL587 1PL588
14D	1-PENT-293-5	FJ3-B150	HI	Y 1600 Y	N/A	N/A	SHAW-MUT	CP6A-14 4/0	Y 2/15/90 RKB Y 2/15/90 RKB	4/0 2/0	1PL861 1PL862
15A	1-PENT-293-32 (1-HTR-30-35H)	EF3-B070	N/A	Y 70	N/A	N/A	"	DISAB100	N 100	4 4	1PL425 1PL426
15D	1-MTR-30-1	B100	N/A	Y 100	3	T56	N/A	N/A	N/A	2x2	1PL777
16A	1-PENT-293-5	B070	N/A	Y 70	N/A	N/A	SHAW-MUT	DISAB100	N 100	4 4	1PL440 1PL441
16D	1-MTR-30-1E	A100	3	Y 760	3	T56	N/A	N/A	N/A	2	1PL764

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Calculation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchart Date 1/22/90 Checked [illegible] Date 1/26/90
[illegible] 1/16/90 R.H. Buchart 1/25/90
G.L. Bates 2/5/90 R. Sulphar 2-5-90

1-MCC-232-B

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2A	1-PENT-293-47 (1-MTR-77-125B)	A010	3	Y45	1	T33	SHAW-MUT	TRS-30	N30	12 10	1PL672 1PL673
3A	1-PENT-293-35	B020	N/A	Y20	N/A	N/A	"	"	Y30	10 10	1PL280 1PL281
3B	1-PENT-293-35	B020	N/A	Y20	N/A	N/A	"	D15A030	N30	10 10	1PL285 1PL286
3C	1-PENT-293-35	B020	N/A	Y20	N/A	N/A	"	D15A030	N30	10 10	1PL290 1PL291
5E	1-MTR-30-11	A003	2	Y10	1	T16	N/A	N/A	N/A	12	1PL794
6A	0-MTR-31-26	A010	4	Y58	1	T34	N/A	N/A	N/A	12	1PL752
6C	1-MTR-61-61	L050	4	N330	2	T51	N/A	N/A	N/A	8	1PL4325
6D	1-HTR-61-93	B050Z	N/A	Y50		T51	N/A	N/A	N/A	6	1PL4310
6E	1-MTR-30-11E	A003	2	Y10	1	T16	N/A	N/A	N/A	12	1PL760
6F1	1-STR-40-2	B020	N/A	Y20	N/A	N/A	SHAW-MUT	D15A030	N30	10	1PL695
7B	1-PENT-293-35	A010	4	Y58	1	T36	"	TRS-30	N30	12 12	1PL376 1PL377
7D	1-PENT-293-35	B040	N/A	Y40	1	T44	"	"	Y30	10 10	1PL402 1PL403
8B	1-PENT-293-47	A010	2	Y36	1	T36	"	"	N30	12 12	1PL388 1PL389
8D	1-PENT-293-47	B040	N/A	Y40	1	T44	"	"	Y30	10 10	1PL414 1PL415
8F1	0-SW-234-B/IPS	B030	N/A	Y30	N/A	N/A	SHAW-MUT	D15A030	Y30	1/0X2	1PL1115
9B	1-PENT-293-35	A025	LO	Y75 Y	1	T40	"	TRS-30	Y30 N	10 12	1PL531 1PL532

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Calculation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R. H. Buchert Date 1/22/90 Checked Engineer Date 1/26/90

Engineer H. Bates 1/16/90 2/5/90 R.H. Buchert 1/25/90 R. Suplkar 2-5-90

1-MCC-232-B

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
10B	1-PENT-293-47	A025	2	Y 105 Y	1	T40	SHAWMUT	TRS-30	Y 30 N	10 12	1PL561 1PL562
10F	1-PENT-293-11	B020	N/A	Y 20	N/A	N/A	"	"	Y 30	10 10	1PL707 1PL708
11D	1-PENT-293-11	B100	N/A	Y 100	2	T49	"	TRS-60	Y 60	4 4	1PL496 1PL497
11F	1-PENT-293-35	B020	N/A	Y 20	N/A	N/A	"	D15A030	N 30	10 10	1PL345 1PL346
12F	1-PENT-293-35	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10 10	1PL5450 1PL5451
13B	1-PENT-293-11	A010	2	Y 36 Y	1	T29	"	TRS-30	Y 30 N	10 12	1PL598 1PL599
13D	1-PENT-293-11	FJ3-B175	HI	Y 1600 Y	N/A	N/A	"	cp6A-14 4/0	Y Y Y	4/0 2/0 2/0	1PL897 1PL975 1PL902 *
13F	1-PENT-293-11	EF3-B050	N/A	Y 50	N/A	N/A	"	D15A050	Y 50	6 6	1PL712 1PL713
14B	1-PENT-293-11	A003	LO	Y 7	1	T12	"	TRS-30	N 30	12 12	1PL1100 1PL1101
14D	1-PENT-293-11 (AHU)	FJ3-B150	HI	Y 1600 Y	N/A	N/A	"	cp4/0 -CS	Y	4/0 2/0 2/0	1PL937 1PL938 1PL943 **
14F	1-PENT-293-11	EF3-B040	N/A	Y 40	N/A	N/A	"	D15A050	Y 50	6 6	1PL704 1PL705
15A	1-PENT-293-35	B070	N/A	Y 70	N/A	N/A	"	D15AB100	N 100	4 4	1PL454 1PL455
15D	1-MTR-30-4	A100	3	Y 760	3	T57	N/A	N/A	N/A	2	1PL785
16A	1-PENT-293-47	B070	N/A	Y 70	N/A	N/A	SHAWMUT	D15AB100	N 100	4 4	1PL468 1PL469
16D	1-MTR-30-4E	A100	3	Y 760	3	T57	N/A	N/A	N/A	2	1PL768

* 1PL 902 → 1PL 907 (2/0) → 1PL 912 (2/0) → 1PL 917 (2/0) → 1PL 922 (2/0) → 1PL 927 (2/0) → 1PL 932 (2/0)

** 1PL 943 → 1PL 948 (2/0) → 1PL 953 (2/0) → 1PL 958 (2/0) → 1PL 963 (2/0) → 1PL 968 (2/0)

WBN EEB-MS- TI15-0011 R0 Page H53A of H72

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared: GS Bates Date 2/5/90 Checked R Sundar Date 2-5-90

2-DPL-68-341F

COMPT No	SERVICE	BKR MODEL NO	SENSOR RATING (A)	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
	Pressurizer Htr Group D	~~SL~~ Y 100	100						JJS-225 Y	1/0	2PL6410 2PL6411 2PL6412 2PL6413 2PL6414 2PL6415
									Y	1/0	2PL4655 2PL4656 2PL4657 2PL4658 2PL4659 2PL4660
									Y	2	2PL4661 2PL4662 2PL4663 2PL4664 2PL4665 2PL4666

WBN EEB-MS-TI15-0011 R0 Page H54A of H72

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R Supkar Date 2-5-90 Checked G L Bates Date 2/5/90

2-DPL-68-341H

COMPT NO	SERVICE	BKR MODEL NO	SENSOR RATING (A)	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
	Pressurizer Heater Backup Group C	KJL100	100						JJS225	1/0	2PL6430
											2PL6431
											2PL6432
											2PL6433
											2PL6434
											2PL6435
										1/0	2PL4702
											2PL4703
											2PL4704
											2PL4705
											2PL4706
											2PL4707
										2	2PL4710
											2PL4711
											2PL4712
											2PL4713
											2PL4714
											2PL4715

CBN EEB-MS-TI15-0011 RO

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmaghmudar Date 1/22/90 Checked R.H. Buchart Date 1/26/90
R.H. Buchart 1/10/90 kmaghmudar 1/25/90

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2-MCC-209-A											
/7D	2-FCV-3-253	L050	2	N 210		T49	←	N/A	→	10	2V4649
/10C	2-FCV-3-250	A025Z	3	Y125		T42	←	N/A	→	10	2V4640
/13E	2-FCV-3-251	A025	3	Y125		T42	←	N/A	→	10	2V4643
2-MCC-209-C											
/3F2	2-DXF-264-1	B100	N/A	Y100	N/A	N/A	←	N/A	→	2	2PL6660
2-MCC-210-A											
/2D	2-FCV-3-252	A025	3	Y125	1	T42	←	N/A	→	10	2V4646
/2F2	2-PO-210-A4	B050	N/A	Y50	N/A	N/A	←	N/A	→	8	2PL1195
	45W753-2,3 R12,8										
	45W753-6, R10										
	45W757-4,2 R16-10										

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BN EEB-MS-TI15-0011 RO

bulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchholz Date 1/22/90 Checked kmg/mcdar Date 1/26/90

kmg/mcdar 1/16/90 Dwg/pelley 1/25/90

J.B. Bates 2/5/90 R. Sunkar 2-5-90

2-MCC-213-A1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
16A	2-PENT-293-32 (2-MTR-31-265)	A010	3	Y 45	1	T34	SHAW-MUT	TRS-30	Y 30 N	10 12	2PL6300 2PL6301
16B	2-PENT-293-24 (2-MTR-77-129)	A010	LO	Y 27	1	T27	"	"	Y 30 N	10 12	2PL6268 2PL6269
16F1	O-XSW-252-1	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	2PL6040
16F2	2-TB-31-303/2	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	2PL6289
17A	O-JB-292-2051 (2-HTR-62-228/4)	B030	N/A	Y 30 Y	neg pole missing	N/A	N/A	N/A	N/A	8 12 12	2PL6208 2PL6209 2PL6210
17E	2-PENT-293-32 (2-PO-213-A1/4) (2-PO-213-A1/5)	B100	N/A	Y 100	N/A	N/A	SHAW-MUT	CPGA-197 #2	N Y JAB 2/15/90 RAB 2/15/90	2 2	2PL6100 2PL6094
18C	2-MTR-31-303/1	A010	3	Y 45	1	T32	N/A	N/A	N/A	12	2PL6281
18F1	O-XSW-253-1	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	PL888
18F2	2-JB-293-2860 (2-PO-213-A1/G-10)	B100	N/A	Y 100	N/A	N/A	N/A	N/A	N/A	2	2PL6093

BN EEB-MS- TI15-0011 R0

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Engineer Date 1/22/90 Checked R.H. Bucket Date 1/26/90
Engineer 1/16/90 Scott McKelley 1/25/90

2-MCC-213-A2

COMPT NO	SERVICE	BKR TYPE EF3-	SET POS	TRIP RATING (A)	STR SIZE	OL HTR CAT# G30	SECONDARY PROTECTION MFR	MODEL	RATING	CABLE SIZE	CABLE NO
4A	2-FCV-3-191	A010	3	Y 45	1	T31	N/A	N/A	N/A	12	2V3260
4B	2-FCV-3-192	A010	3	Y 45	1	T31	N/A	N/A	N/A	12x2	2V3280
13B	0-FCV-67-360	A010	LO	Y 27	1	T28	N/A	N/A	N/A	12	2V3230

WBN EEB-MS-TI15-0011 R0 Page H57 of H72

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R. H. Bucknor Date 1/22/90 Checked Kaghubar Date 1/26/90
Kaghubar 1/16/90
G.L. Bates 2/15/90
Scott Kelley 1/25/90
R. Supkar 2-5-90

2-MCC-213-B1

COMPT NO	SERVICE	BKR TYPE EF3-	SET POS	TRIP RATING (A)	STR SIZE	OL HTR CAT# G30	SECONDARY PROTECTION MFR	MODEL	RATING	CABLE SIZE	CABLE NO
3F1	0-XSW-252-2	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	2PL6045
16A	2-PENT-293-35 (2-MTR-31-266)	A010	3	Y 45 Y	1	T34	SHAWMUT	TRS-30	Y 30 N	10 12	2PL6310 2PL6311
16E	2-PENT-293-47 (2-PO-213-31/1-5)	B100	N/A	Y 100	N/A	N/A	"	CPGA-81 #2 -197	~~N~~ Y 2/15/90 A&B 2/15/90	2x2 2	2PL6085 2PL6086
17A	0-JB-292-2048 (2-HTR-62-226)	B040	N/A	Y 40 N	2	N/A	N/A	N/A	N/A	8x2 12 12	2PL6214 2PL6215 2PL6216
17E	2-PENT-293-35 (2-PO-213-31/6-10)	B100	N/A	Y 100	N/A	N/A	SHAWMUT	CPGA-197 #2	~~N~~ Y 2/15/90 R&B 2/15/90	2 2	2PL6075 2PL6076
17F1	0-XSW-253-2	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	PL894
17F2	2-TB-31-324/2	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	2PL6291
18C	2-MTR-31-324/1	A010	3	Y 45	1	T32	N/A	N/A	N/A	10	2PL6285

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmaynard Date 1/22/90 Checked R.A. Buchert Date 1/26/90
kmaynard 1/16/90 Scott Melley 1/25/90

2-MCC-213-B2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
4A	2-FCV-3-193	A010	3	Y45	1	T31	N/A	N/A	N/A	12x2	2V3290
4B	2-FCV-3-194	A010	3	Y45	1	T31	N/A	N/A	N/A	12	2V3270
5A	0-FCV-26-15	A003	LO	Y7	1	T6	N/A	N/A	N/A	12	2V3360
5B	0-FCV-26-16	A003	LO	Y7	1	T6	N/A	N/A	N/A	12	2V3370

GLB 2/5/90
Tom 3-1-91

WBN EEB-MS-TI15-0011 R0 Page H59 of H72

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R. H. Bruchert Date 1/22/90 Checked Kinaytn uclear Date 1/26/90
Kinaytn uclear 1/16/90 Scott Kelley 1/25/90

2-MCC-214-A1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2D	2-MTR-81-3	H050	2	Y 400	3	T51	N/A	N/A	N/A	6	2PL3221
2F1	0-DXF-234-A2/SIS	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	HFCP	N 30	10	2PL3590
2F2	2-DXF-242-1	B070	N/A	Y 70	N/A	N/A	"	"	N 100	4	2PL3596
3F1	2-RE-90-119	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10	2PL3589
10F1	0-TB-40-3	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10	2PL3720
12F2	0-DXF-227-1	B050	N/A	Y 50	N/A	N/A	"	"	Y 50	6	2PL3713
7D	0-DXF-234-A1/CVCS	FJB-B125	N/A	Y 125	N/A	N/A	N/A	N/A	N/A	1/0	2PL3580
4F2	0-DXF-234-A4	EF3-B020	N/A	Y 20	N/A	N/A	SHAW-MUT	HFCP	N 20	10	2PL3017
12E1	2-PNL-90-L398	B020Z	N/A	Y 20	N/A	N/A	"	"	N 30	10	2PL3610
13A	2-MTR-84-16	A005	3	Y 22	1	T25	N/A	N/A	N/A	12	2PL2940
13C	2-MTR-65-77	A005	HI	Y 41	1	T31	N/A	N/A	N/A	12	2PL3645

GLB 2/15/90
4mm 3-7-91

CBN EEB-MS-TI15-0011 R0

Calculation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Kajmudar Date 1/22/90 Checked R.H. Buchart Date 1/26/90
R.H. Buchart 1/10/90 Scott Kelley 1/25/90

2-MCC-214-B1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2D	2-MTR-81-7	A050	2	Y400	3	T51	N/A	N/A	N/A	6	2PL3228
3F2	0-DXF-234-B2/SIS	B020	N/A	Y20	N/A	N/A	SHAW-MUT	DISA030*	N30	10	2PL3375
2F1	0-TB-40-66	B020	N/A	Y20	N/A	N/A	"	"	N30	10	2PL3730
9F1	2-PNL-55-L237	B020	N/A	Y20	N/A	N/A	SHAW-MUT	DISA030*	N30	10	2PL2972
12A	2-MTR-30-181	A010	3	Y45	1	T32	N/A	N/A	N/A	10	2PL3021
7D	0-DXF-234-B1/CVCS	FJ3-B125	HI	Y1600	N/A	N/A	N/A	N/A	N/A	2/0	2PL3744
12F1	2-RE-90-99	EF3-B020	N/A	Y20	N/A	N/A	SHAW-MUT	DISA030*	N30	10	2PL3790
13A	2-MTR-84-21	A005	3	Y22	1	T25	N/A	N/A	N/A	12	2PL2948
12F2	0-DXF-227-3	B070	N/A	Y70	N/A	N/A	SHAW-MUT	DISAB100*	N100	4	2PL3719
13C	2-MTR-65-74	A005	HI	Y41	1	T31	N/A	N/A	N/A	12	2PL3660

Shamut DISA and HFCP are the same fuse.

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Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Engineer Date 1/22/90 1/16/96 Checked R.H. Buchholz Date 1/26/90 Dwight Kelley 1/25/90

2-MCC-214-A2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	DL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2D1	2-HTR-30-A1A	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	D15A030	N 30	10	2PL3280
6D1	0-HTR-30-AB1	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10	2PL2815
2E1	2-HTR-30-B1A	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10	2PL3284
6F1	0-HTR-31-339	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10	2PL3833
7D1	0-HTR-30-AB2	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10	2PL2819
3A	2-MTR-30-25	A010	3	Y 45	1	T31	N/A	N/A	N/A	12x2	2PL2906
3D1	2-HTR-30-ACRD	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	D15A030	N 30	10	2PL3266
3E1	2-HTR-30-C1A	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10	2PL3288
3E2	2-HTR-31-D1A	B050	N/A	Y 50	N/A	N/A	"	D15A050	Y 50	6x2	2PL3510
3F1	0-HTR-31-91	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	D15A030	N 30	10	2PL2800
3F2	2-HTR-30-1A1	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10	2PL3365
4A	2-MTR-30-67	A005	4	Y 29	1	T29	N/A	N/A	N/A	12	2PL3621
4E1	2-HTR-30-BCRD	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	D15A030	N 30	10x2	2PL3264

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Engineer 1/22/90 Date 1/22/90 Checked [signature] Date 1/26/90

Engineer 1/16/90 Scott Kelley 1/25/90

2-MCC-214-A2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
4F1	2-HTR-30-CCRD	B020	N/A	Y20	N/A	N/A	SHAWMUT	DISA030	N30	10X2	2PL3268
5A	2-MTR-30-301	A010	3	Y45	1	T34	N/A	N/A	N/A	12	2PL3435
5E1	0-HTR-31-71	B030	N/A	Y30	N/A	N/A	SHAWMUT	DISA030	Y30	8	2PL3691
5F1	2-HTR-30-XM1A	B020	N/A	Y20	N/A	N/A	"	"	N30	10	2PL3370
5F2	2-HTR-30-AB1	B020	N/A	Y20	N/A	N/A	"	"	N30	10	2PL3314
6E1	2-HTR-30-SMS	B030	N/A	Y30	N/A	N/A	"	"	Y30	8	2PL2811
6E2	2-HTR-30-NM1	B050	N/A	Y50	N/A	N/A	"	DISA050	Y50	6	2PL2806
6F2	0-HTR-30-KM3	B020	N/A	Y20	N/A	N/A	"	DISA030	N30	10	2PL3320
7D2	0-HTR-30-DFH	B040	N/A	Y40	N/A	N/A	"	DISA050	Y50	6	2PL3335
7E1	2-HTR-30-U1A	B020	N/A	Y20	N/A	N/A	"	DISA030	N30	10	2PL2813
7E2	0-HTR-30-EFH	B040	N/A	Y40	N/A	N/A	"	DISA050	Y50	6	2PL3330
7F2	0-HTR-30-FFH	B040	N/A	Y40	N/A	N/A	"	"	Y50	6	2PL3340
8A	2-MTR-30-CRD	FJ3-B125L	HI	Y1600	N/A	N/A	N/A	N/A	N/A	2/0	2PL3692
8B	2-HTR-1-CB5	FJ3-B125	HI	Y1600	N/A	N/A	N/A	N/A	N/A	4/0	2PL3680

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R. H. Buchert for engineer Date 1/22/90 1/16/90 Checked Engineer R. H. Buchert Date 1/27/90 1/25/90

2-MCC-214-B2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2B	0-MTR-30-27	A005	4	Y 29	1	T27	N/A	N/A	N/A	12	2PL3812
2E1	2-HTR-30-AIB	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	D15A030	N 30	10	2PL3676
2E2	0-HTR-30-KFA	B040	N/A	Y 40	N/A	N/A	"	D15A050	Y 50	6	2PL3400
2F1	2-HTR-30-BIB	B020	N/A	Y 20	N/A	N/A	"	D15A030	N 30	10	2PL3898
2F2	2-HTR-31-BRB	B050	N/A	Y 50	N/A	N/A	"	D15A050	Y 50	6	2PL3890
3B	2-MTR-30-285	A005	4	Y 29	1	T29	N/A	N/A	N/A	12	2PL3626
3F2	0-HTR-31-93	B040	N/A	Y 40	N/A	N/A	SHAW-MUT	D15A050	Y 50	6	2PL3851
3E1	2-HTR-30-CIB	B020	N/A	Y 20	N/A	N/A	"	D15A030	N 30	10	2PL3895
3E2	0-HTR-30-LFA	B040	N/A	Y 40	N/A	N/A	"	D15A050	Y 50	6	2PL3405
3F1	2-HTR-30-PRX	B020	N/A	Y 20	N/A	N/A	"	D15A030	N 30	10	2PL3395
4B	2-MTR-30-302	A010	3	Y 45	1	T32	N/A	N/A	N/A	12	2PL3438
4E1	0-HTR-31-85	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	D15A030	N 30	10	2PL2809
4E2	0-HTR-30-PFA	B040	N/A	Y 40	N/A	N/A	"	D15A050	Y 50	6	2PL3415
4F1	2-HTR-30-SBU	B020	N/A	Y 20	N/A	N/A	"	D15A030	N 30	10	2PL3425
4F2	2-HTR-30-U113	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10	2PL2975
5E1	2-HTR-31-89	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	D15A030	N 30	10	2PL2825

WBN EEB-MS- TI15-0011 RO
Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchert Engineer Date 1/22/90 1/16/90 Checked Engineer Date 1/27/90 R.H. Buchert 1/20/90

TAC # 3-7-91

2-MCC-214-B2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	DL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
5F1	0-HTR-30-RM4	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	D15A030	N 30	10	2PL3385
6B	2-MTR-30-26	A010	3	Y 45	1	T33	N/A	N/A	N/A	12	2PL2913
6E1	2-HTR-30-AB7	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	D15A030	N 30	10	2PL3381
6F1	2-HTR-30-T1B	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10	2PL3430
5F2	0-HTR-30-U1	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	D15A030	N 30	10	2PL2817
7F1	2-HTR-30-NM2	B050	N/A	Y 50	N/A	N/A	"	D15A050	Y 50	6	2PL3421
7E1	0-HTR-31-99	B020	N/A	Y 20	N/A	N/A	"	D15A030	N 30	10	2PL3840
8F2	2-JB-292-19	B100	N/A	Y 100	N/A	N/A	"	D15AB100	Y 100	2	2PL2785
9A	2-MTR-30-CRB	B125	LO	Y 750	N/A	N/A	N/A	N/A	N/A	2/0	2PL3671
8E2	0-HTR-30-A14	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	D15A030	N 30	10	2PL3390

WBN EEB-MS-TI15-0011 R0
Calculation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Kim Schneider Date 1/22/90 Checked R.H. Bucheit Date 1/26/90
R.H. Bucheit 1/17/90 Kim Schneider 1/25/90

2-MCC-215-A1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
5A	2-MTR-82-241	A025Z	LO	Y75	1	T38	N/A	N/A	N/A	12	PL2205
5F1	0-HTR-30-480	B020	N/A	Y20	N/A	N/A	N/A	N/A	N/A	10	PL2334
5F2	2-JB-296-257 (P.O.'S)	B100	N/A	Y100	N/A	N/A	N/A	N/A	N/A	2	PL2543
6A	2-SW-30-464	A005	2	Y15	1	T26	N/A	N/A	N/A	12	PL2242

SN EEB-MS-TI15-0011 RO

bulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Kmajmudar Date 1/22/90 Checked R.H. Buchart Date 1/26/90

R.H. Buchart 1/17/90 Kmajmudar 1/25/90

2-MCC-215-B1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	DL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
5A	2-MTR-82-271	A025Z	LO	Y75	1	T38	N/A	N/A	N/A	12	PL2225
5F1	0-HTR-30-482	B020	N/A	Y20	N/A	N/A	N/A	N/A	N/A	10	PL2328
6A	2-SW-30-466	A005	2	Y18	1	T26	N/A	N/A	N/A	12	PL2255
5F2	2-JB-296-259 (P.O.'s)	B100	N/A	Y100	N/A	N/A	N/A	N/A	N/A	2	PL2556

WBN EEB-MS-TI15-0011 RO
Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared [illegible] Date 1/22/90 Checked R.H. Bucknert Date 1/26/90
R.H. Bucknert 1/17/90 [illegible] 1/25/90

2-MCC-215-A2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
3E1	2-HTR-30-488	B020	N/A	Y20	N/A	N/A	N/A	N/A	N/A	10	PL2413
3F1	2-HTR-30-475	B030	N/A	Y30	N/A	N/A	N/A	N/A	N/A	8	PL2286
3F2	2-HTR-30-476	B030	N/A	Y30	N/A	N/A	N/A	N/A	N/A	8	PL2292
5A	2-MTR-82-240	A025Z	LO	Y75	1	T38	N/A	N/A	N/A	12	PL2210
6D	2-TB-82-A/1-A	B020	N/A	Y20	1	N/A	N/A	N/A	N/A	12	PL2703

BN EEB-MS- TI15-0011 RO
Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Engineer Date 1/22/90 Checked R.A. Buchert Date 1/26/90
R.A. Buchert 1/17/90 Engineer 1/25/90

2-MCC-215-B2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
3E1	2-HTR-30-490	B020	N/A	Y20	N/A	N/A	N/A	N/A	N/A	10	PL2414
3F1	2-HTR-30-477	B030	N/A	Y30	N/A	N/A	N/A	N/A	N/A	8	PL2298
3F2	2-HTR-30-478	B030	N/A	Y30	N/A	N/A	N/A	N/A	N/A	8	PL2775
5A	2-MTR-82-270	A025	LO	Y75	1	T38	N/A	N/A	N/A	12	PL2230
6D	2-TB-82-B1-B	B020	N/A	Y20	1	N/A	N/A	N/A	N/A	12	PL2709
4B	0-MTR-18-913	A025	3	Y25	1	T24	N/A	N/A	N/A	10	PL2460

WBN EEB-MS- TI15-0011 RO

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R. H. Buchert Date 1/22/90 Checked [illegible] Date 1/26/90

Lmadayola 1/16/90 Dwight Kelley 1-25-90

D Bates 2/5/90 R. Sunkar 2-5-90

2-MCC-232-A

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2A	2-PENT-293-24	A010	3	Y 45	1	T33	SHAW-MUT	TRS-30	Y 30	10	2PL653
				Y					N	12	2PL654
3A	2-PENT-293-35 FLUX D	B020	N/A	Y 20	N/A	N/A	"	"	Y 30	10x2	2PL295
										10	2PL296
3B	2-PENT-293-35 FLUX E	B020	N/A	Y 20	N/A	N/A	"	DISA030	N 30	10x2	2PL300
										10	2PL301
3C	2-PENT-293-35 FLUX F	B020	N/A	Y 20	N/A	N/A	"	DISA030	N 30	10x2	2PL305
										10	2PL306
4D	2MTR-61-51	L050	4	N 330	2	T51	N/A	N/A	N/A	8	2PL4320
4E	2-HTR-61-92	B050	N/A	Y 50	2	T51	N/A	N/A	N/A	6x2	2PL4300
6C	0-MTR-77-105	H050	LO	Y 320	2	T52	N/A	N/A	N/A	6x2	2PL5460
7B	2-PENT-293-32 RCP 1 HTR	A010	2	Y 36	1	T36	"	TRS-30	N 30	12	2PL370
										12	2PL371
7D	2-PENT-293-32 RCP 1 LIFT	A025	4	Y 170	1	T44	"	"	Y 30	10	2PL396
										10	2PL397
7F2	2-JB-292-981 (480V RECPT'S)	B100	N/A	Y 100	N/A	N/A	SHAW-MUT	DISAB100	Y 100	2	2PL258
8B	2-PENT-293-24 RCP 3 HTR	A010	2	Y 36	1	T36	"	TRS-30	N 30	12	2PL382
										12	2PL383
8D	2-PENT-293-24 RCP 3 LIFT	A025	3	Y 125	1	T44	"	"	Y 30	10	2PL408
										10	2PL409
8F2	2-PO-232-9	B100	N/A	Y 100	N/A	N/A	SHAW-MUT	DISAB100	Y 100	2	2PL240

EEB-MS- TI15-0011 RO

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchert Date 1/22/90 1/16/90 2/15/90 Checked [illegible] Date 1/26/90 1-25-90 2-5-90

2-MCC-232-A

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING (A)	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION MFR	SECONDARY PROTECTION MODEL	SECONDARY PROTECTION RATING	CABLE SIZE	CABLE NO
		EF3-				G30					
9B	2-PENT-293-32 FAN A	A025	LO	Y 75 Y	1	T40	SHAW-MUT	TRS-30	Y 30 N	10 12	2PL520 2PL521
10B	2-PENT-293-24 FAN C	A025	2	Y 105 Y	1	T44	"	"	Y 30 N	10 12	2PL550 2PL551
10E	2-PENT-293-32 STUD	B020	N/A	Y 20 Y	N/A	N/A	"	"	Y 30 N	10 12	2PL270 2PL271
11D	2-PENT-293-24 RCDT A	B030	N/A	Y 30	2	T47	"	TRS-60	N 60	10 10	2PL485 2PL486
11F	2-PENT-293-32 HTR A	B020	N/A	Y 20	N/A	N/A	"	DIS A030	N 30	10 10	2PL336 2PL337
12F	2-PENT-293-32 HTR A	B020	N/A	Y 20	N/A	N/A	"	TRS-30	Y 30	10 10	2PL5440 2PL5441
13A	2-PENT-293-5	B040	N/A	Y 40	N/A	N/A	"	TRS-40	Y 40	6 6	2PL621 2PL622
13D	2-PENT-293-5 (AHU)	FJ3-B175	HI	Y 1600 Y	N/A	N/A	"	CP6A-14 4/0	~~Y~~ Y RED 2/15/90	4/0 2/0	2PL820 2PL821 *
14B	2-PENT-293-5	A010	2	Y 36	1	T29	"	TRS-30	N 30	12 12	2PL587 2PL588
14D	2-PENT-293-5 (AHU)	FJ3-B150	HI	Y 1600 Y	N/A	N/A	"	CP6A-14 4/0	~~Y~~ Y RED 2/15/90	4/0 2/0 2/0	2PL861 2PL862 2PL867 **
15A	2-PENT-293-32	B070	N/A	Y 70	N/A	N/A	"	D15AB100	N 100	4 4	2PL425 2PL426
15D	2-MTR-30-1	A100	3	Y 760	3	T56	N/A	N/A	N/A	2	2PL777
16A	2-PENT-293-5	B070	N/A	Y 70	N/A	N/A	SHAW-MUT	D15AB100	N 100	4 4	2PL440 2PL441
16D	2-MTR-30-1E	A100	3	Y 760	3	T56	N/A	N/A	N/A	2	2PL764

* 2PL821 → 2PL826(2/0) → 2PL831(2/0) → 2PL836(2/0) → 2PL841(2/0) → 2PL846(2/0) → 2PL851(2/0) → 2PL856(2/0) → ~~2PL858~~ YLB 2/5/90

** 2PL867 → 2PL872(2/0) → 2PL877(2/0) → 2PL882(2/0) → 2PL887(2/0) → 2PL892(2/0) ~~YLB~~ 2/5/90

WBN EEB-MS- TI15-0011 RO Page H71 of H72

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared [signature] Date 1/22/90 Checked R.H. Bucholt Date 1/26/90
[signature] 1/16/90 Scott McKelley 1/25/90
[signature] 2/5/90 R. Suphar 2-5-90
[signature]

2-MCC-232-B

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2A	2-PENT-293-47	A010	3	Y45	1	T33	SHAW-MUT	TRS-30	N30	12 10	2PL672 2PL673
3A	2-PENT-293-32	B020	N/A	Y20	N/A	N/A	"	DISA030	N30	10x2 10	2PL280 2PL281
3B	2-PENT-293-32	B020	N/A	Y20	N/A	N/A	"	"	N30	10x2 10	2PL285 2PL286
3C	2-PENT-293-32	B020	N/A	Y20	N/A	N/A	"	"	N30	10x2 10	2PL290 2PL291
5E	2-MTR-30-11	A003	4	Y16	1	T16	N/A	N/A	N/A	12	2PL794
6F2	2-JB-292-1868	B100	N/A	Y100	N/A	N/A	SHAW-MUT	DISAB100	Y100	2	2PL233
6C	2-MTR-61-61	L050	4	N330	2	T51	N/A	N/A	N/A	8	2PL4325
6D	2-HTR-61-93	B050	N/A	Y50	2	T51	N/A	N/A	N/A	6x2	2PL4310
6E	2-MTR-30-11E	A003	2	Y10	1	T16	N/A	N/A	N/A	12	2PL760
6F1	2-STR-40-2	B020	N/A	Y20	N/A	N/A	SHAW-MUT	DISA030	N30	10	2PL695
7B	2-PENT-293-35	A010	2	Y36	1	T36	"	TRS-30	N30	12 12	2PL376 2PL377
7D	2-PENT-293-35	A025	4	Y170 Y	1	T44	"	"	Y30 Y	8 10	2PL402 2PL403
8B	2-PENT-293-47	A010	2	Y36	1	T36	"	"	N30	12 12	2PL388 2PL389
8D	2-PENT-293-47	A025	4	Y170	1	T44	SHAW-MUT	TRS-30	Y30	10 10	2PL414 2PL415
8F2	2-JB-292-1866	B100	N/A	Y100	N/A	N/A	SHAW-MUT	DISAB100	Y100	2	2PL242
9B	2-PENT-293-35	A025	1	Y75 Y	1	T40	"	TRS-30	Y30 N	10 12	2PL531 2PL532

BN EEB-MS-TI15-0011 RO

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared [signature] Date 1/22/90 Checked R. H. Burkhart Date 1/26/90

[signature] 1/16/90 Scott Kelley 1/25/90

[signature] 2/5/90 R. Supkar 2-5-90

[signature]

Z-MCC-232-B

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
10B	2-PENT-293-47	A025	2	Y 105 Y	1	T40	SHAW-MUT	TRS-30	Y 30 N	10 12	2PL561 2PL562
10F	2-PENT-293-11	B020	N/A	Y 20	N/A	N/A	"	D15A030	N 30	10 10	2PL707 2PL708
11D	2-PENT-293-11	B050	N/A	Y 50 Y	2	T47	"	TRS-60	Y 60 Y	4 8	2PL496 2PL497
11F	2-PENT-293-35	B020	N/A	Y 20	N/A	N/A	"	D15A030	N 30	10 10	2PL345 2PL346
12F	2-PENT-293-35	B020	N/A	Y 20	N/A	N/A	"	D15A030	N 30	10 10	2PL5450 2PL5451
13B	2-PENT-293-11	A010	2	Y 36 Y	1	T29	"	TRS-30	Y 30 N	10 12	2PL598 2PL599
13D	2-PENT-293-11 (AHU)	FJ3-B175	HI	Y 1600 Y	N/A	N/A	"	CP6-C5 4/0	Y Y	4/0 2/0 2/0	2PL897 2/5/90 2PL875 2PL902
13F	2-PENT-293-9	EF3-3050	N/A	Y 50	N/A	N/A	"	D15A050	Y 50	6	2PL712
14B	2-PENT-293-11	A003	LO	Y 7	1	N/A	"	TRS-30	N 30	12	2PL1100
14D	2-PENT-293-11 (AHU)	FJ3-B150	HI	Y 1600 Y	N/A	N/A	"	CP6-C5 4/0	Y Y	4/0X2 2/0 2/0	2PL937 2PL938 2PL943
14F	2-PENT-293-11	EF3-B040	N/A	Y 40	N/A	N/A	"	D15A050	Y 50	6 6	2PL704 2PL705
15A	2-PENT-293-35	B070	N/A	Y 70	N/A	N/A	"	D15AB100	N 100	4 4	2PL454 2PL455
15D	2-MTR-30-A	A100	3	Y 760	3	T56	N/A	N/A	N/A	2	2PL785
16A	2-PENT-293-47	B070	N/A	Y 70	N/A	N/A	SHAW-MUT	D15AB100	N 100	4 4	2PL468 2PL469
16D	2-MTR-30-4E	A100	3	Y 760	3	T56	N/A	N/A	N/A	2X2	2PL768

* 2PL902 → 2PL907(2/0) → 2PL912(2/0) → 2PL917(2/0) → 2PL922(2/0) → 2PL927(2/0) → 2PL932(2/0)

* 2PL943 → 2PL948(2/0) → 2PL953(2/0) → 2PL958(2/0) → 2PL963 (2/0) → 2PL968(2/0)

Form GO-3.08.1 Rev. 2 SL-F647 04/84

ATTACHMENT NO. UVA2.1/2.4
RESOLUTION OF UNVERIFIED ASSUMPTIONS 2.1 AND 2.4

DOCUMENTATION OF UNVERIFIED ASSUMPTION 2.1

The Computerized Cable Routing System (CCRS) capabilities generating this report have been subjected to (and successfully satisfied) verification and validation testing in accordance with NEP 3.8. The routines utilized to generate this report were identical to those in the verified CCRS Version 7 (See attached test results report).

TENNESSEE VALLEY AUTHORITY

WATTS BAR NUCLEAR PLANT CABLE ROUTING SYSTEM

SOFTWARE VERIFICATION AND VALIDATION REPORT

ID Y9894

REVISION 1

October 01, 1990

	Signature	Date
Sponsor Approval	R. M. Shriver, Jr.	10/15/90
WBDP Supervisor Approval	Aleta F. Leonard	9/28/90
Independent Review	E. J. Dennick	9-28-90
Prepared By	[illegible]	9-28-90

COMPUTER SOFTWARE REVISION/SIGNATURE LOG

SOFTWARE VERIFICATION AND VALIDATION REPORT

Revision	Description of Revision
0	Initial Issue
1	Deleted all SVVR sections except SVVP Test Plan Results and index. Executed tests for Version 7 changes.

WATTS BAR NUCLEAR PLANT CABLE ROUTING SYSTEM

SOFTWARE VERIFICATION AND VALIDATION PLAN

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WATTS BAR NUCLEAR PLANT CABLE ROUTING SYSTEM

SOFTWARE VERIFICATION AND VALIDATION REPORT

1.0 SVVP TEST PLAN RESULTS.

Version 7 of the *Watts Bar Cable Routing System* was tested in accordance with Revision 3 of the Software Verification and Validation Plan. See page 1-2 for an index of the required tests.

The results of test plan execution conform to the expected results described in the Software Verification and Validation Plan. The original test plan documents are in the Computer Systems Library.

WATTS BAR CABLE ROUTING SYSTEM
TEST INDEX FOR VERSION 7

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FILPRT1F	ROUTER01 FINAL
FILPRT2I	CLSTR2 INITIAL
ROUTER02	9.5.3.2
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FILPRT3I	CLSTR3 INITIAL
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FILPRT4I	CLSTR4 INITIAL
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FILPRT6I	CLSTR6 INITIAL
FILPRT6F	ONLINE TEST FINAL
WBSAVE01	11.2.2.3
WBRSTR01	11.3.2.3
RLODPRTI	14.1.2.2
TESTCNCB	14.1.2.3
TESTSGCB	14.1.2.3
TESTEQPC	14.1.2.3
TESTEQCN	14.1.2.3
HICOND	14.1.2.3
HINTWK	14.1.2.3
RLODCONC	14.1.2.4
RLODCOND	14.1.2.5
RLODSEGC	14.1.2.6
RLODNTWK	14.1.2.7
RLODCTYP	14.1.2.8
RLODEQPC	14.1.2.9
RLODEQCN	14.1.2.10
RLODEQPT	14.1.2.11
RLODPRTF	14.1.2.2

ATTACHMENT UVA2.1/2.4
CALCULATION WBN-EEB-MS-T115-0011, REV. 10

Prepared: M.V. Rubenstein Date: 12-19-90 Checked: W O Myers Date: 12-19-90

I. Objective: Resolution of unverified assumption 2.4.

Identify all voltage level 4 or 5 cables (routed in conduit) which pass from the Turbine Building into a seismic Category I structure and then back into the Turbine Building. Once a cable is identified as entering a Category I structure, its entire route (including cable trays) must be evaluated to determine if it reenters the Turbine Building. For the review of cables routed in trays only, see pages 9 thru 13 of this attachment.

II. Methodology:

The conduit drawings for the Turbine and Control Buildings were reviewed to identify all conduits which pass from the Turbine Building to either the Control or Auxiliary Buildings. The conduit drawings which pertain to the areas of interest are identified in Section IV.

DCDTS was reviewed for outstanding changes to the conduit drawings which could impact this effort. Eighty-three DCNS and three ECN modification packages were reviewed which had outstanding changes posted against the above identified conduit drawings. As a result of this review, voltage level 4 conduits 1PLC3881, 2PLC3880, 1PLC3882, 2PLC3879, and MC694 were identified and added to the list for analysis.

The conduits identified by the above steps were then sorted by voltage level and all voltage level 4 and 5 (power) conduits were listed (see attached). Load reports were then obtained from the Computer Cable Routing System (CCRS) to identify the cables impacted. Each cables route (including cable tray) was identified in the CCRS and traced to determine if the cable passed back into the Turbine Building. Spare and Abandoned cables were excluded from this analysis since they are not energized cables.

III. Results:

No cables were found which were routed across this boundary more than one time.

Attached are the conduit load reports for the voltage level 4 conduits identified. No voltage level 5 (6900V) conduits were identified. These load reports contain the list of cables whose individual routings were evaluated to determine applicability to the above condition.

ATTACHMENT UVA2.1/2.4
CALCULATION WBN-EEB-MS-I115-0011, REV. 10

Prepared: M.W. Richson Date: 12-19-90 Checked: W.O. Myers Date: 12-19-90

IV. References:

Following is the list of drawings that contain plans and details which pertain to the areas of interest of this analysis. Both the as-designed and as-constructed revision levels indicated were reviewed.

45W802- 3, RC & R16
45W802- 6, RF & R32
45W802- 9, RB & R10
45W802-12, RD & R29
45W802-19, RC & R02
45W802-20, RE & R04

45W804- 3, RC & R22
45W804- 6, RG & R31
45W804- 9, RD & R31
45W804-12, RE & R30
45W804-22, RB & R05

45W806- 3, RB & R13
45W806- 6, RC & R18
45W806- 7, RC & R08
45W806- 8, RC & R12

45W808- 1, RB & R16

45W810- 1, RE & R22
45W810- 2, RD & R25
45W810- 3, RC & R27
45W810- 4, RE & R38
45W810- 5, RB & R10
45W810- 6, RD & R08
45W810- 7, RE & R09

45W812- 1, RE & R31
45W812- 2, RF & R34
45W812- 3, RC & R15
45W812- 4, RB & R26
45W812- 6, RC & R27
45W812- 7, RB & R16
45W812- 8, RD & R17
45W812- 9, RG & R07

45W814- 1, RC & R30
45W814- 2, RE & R32
45W814- 3, RE & R24
45W814- 5, RB & R17
45W814- 6, RC & R24
45W814- 7, RD & R20
45W814- 8, RA & R17
45W814- 9, RC & R18
45W814-10, RD & R28
45W814-11, RF & R27
45W814-12, RB & R29
45W814-13, RC & R30
45W814-15, RE & R07
45W814-16, RE & R04

45W816- 1, RF & R36
45W816- 2, RD & R40
45W816- 5, RC & R22
45W816- 7, RF & R13
45W816- 8, RF & R10
45W816-10, RG & R09
45W816-12, RD & R08

45W817, RC & R08

45W818- 1, RC & R06
45W818- 2, RB & R06

INPUT DATA FOR RESOLUTION OF UNVERIFIED ASSUMPTION 2.4 IN CALCULATION WBN-EEB-MS-TI15-0011 REV. ~~5~~ 10

The 45N884 series of drawings were reviewed to identify non-safety related 480 V cable trays passing from the turbine building into adjacent seismic category I structures. Four tray sections were found on drawing 45N884-24. The cables contained in those tray sections appear on the attached loading reports.

The attached loading reports indicate one cable passes through the boundary walls in two locations 2PL3720. This cable does have one termination in the auxiliary building (at 2-MCC-214-A1) and has been addressed in calculation WBN EEB-MS-TI15-0011.

Prepared By: Wesley R. Webster Date: 10-30-90

Reviewed By: Jim Curtis Date: 10-31-90

WBNEEB-MS-TIS-0011, REV 4
PAGE 1<

WATTS BAR NUCLEAR PLANT CABLE ROUTING SYSTEM
TRAY SEGMENT LOADING SCREEN

N 2

Wesley A. Whittaker
PREPARER

10-30-90
DATE

Erich Curtis
REVIEWER

10/31/90
DATE

ACTION CODE: Q (Q-QUERY, X-CANCEL)

CABLES ROUTED IN SEGMENT:	NV	FNOD	TNOD	NO. CABLES: 23	PAGE: 1
	4	1392	2124		

ABN 752 1*	PL 4460 1*
L 534 1*	SP 153 1*
L 535 1*	2PL 3719 1*
L 542 1*	2PL 3720 1*
PL 1240 1*	2V 4640 1*
PL 1250 1*	2V 4643 1*
PL 1260 1*	2V 4646 1*
PL 1280 1*	2V 4649 1*
PL 1295 1*	
PL 1324 1*	
PL 1335 1*	
PL 2450 1*	
PL 2455 1*	
PL 2480 1*	
PL 4402 1*	

SEGMENT RETRIEVED -- TYPE NEW SEGMENT ID OR PRESS ENTER FOR NEXT
ENTER TO PAGE, PF3 TO TOGGLE, ACTION CODE 'X' PLUS PF3 TO EXIT

WATTS BAR NUCLEAR PLANT CABLE ROUTING SYSTEM
TRAY SEGMENT LOADING SCREEN

SCR[redacted]2 Wesley A. Walker 10-30-90
PREPARER DATE

PAGE: 1 Rick Curtis 10/31/90
REVIEWER DATE

ACTION CODE: Q (Q-QUERY, X-CANCEL)

	NV	FNOD	TNOD
CABLES ROUTED IN SEGMENT:	4	1353	2070

NO. CABLES: 11

PL 248 1* √ —
PL 370 1* √ —
PL 378 1* √ —
PL 3080 1* √ —
1A 4665 1* √ —
1PL 167 1* √ —
1PL 3589 1* √ —
1PL 3599 1* √ —
1PL 5033 1* √ —
1PL 5085 1* √ —
1PL 5089 1* √ —

SEGMENT RETRIEVED -- TYPE NEW SEGMENT ID OR PRESS ENTER FOR NEXT
ENTER TO PAGE, PF3 TO TOGGLE, ACTION CODE 'X' PLUS PF3 TO EXIT

WBN EEB-MS-TI15-0011, REV.10 PAGE 12

WATTS BAR NUCLEAR PLANT CABLE ROUTING SYSTEM
TRAY SEGMENT LOADING SCREEN

SC[redacted]2

Audrey A. Watts
PREPARER

10-30-90
DATE

Rick Curtis
REVIEWER

10/31/90
DATE

ACTION CODE: Q (Q-QUERY, X-CANCEL)

	NV	FNOD	TNOD			
CABLES ROUTED IN SEGMENT:	4	1358	2119	NO. CABLES: 11	PAGE: 1	

B 90 1*
L 210 1*
PL 346 1*
PL 4401 1*
SP 155 1*
SP 577 1*
SP 578 1*
1V 4640 1*
1V 4643 1*
1V 4646 1*
1V 4649 1*

SEGMENT RETRIEVED -- TYPE NEW SEGMENT ID OR PRESS ENTER FOR NEXT
ENTER TO PAGE, PF3 TO TOGGLE, ACTION CODE 'X' PLUS PF3 TO EXIT

ATTACHMENT UVA 2.1/2.4
WBN EEB-MS-TI5-001, REV. 1
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WATTS BAR NUCLEAR PLANT CABLE ROUTING SYSTEM
TRAY SEGMENT LOADING SCREEN

SCREEN 2

Wesley G. Wallace
PREPARER

Rich Curtis
REVIEWER

10/30/90
DATE

10/31/90
DATE

ACTION CODE: Q (Q-QUERY, X-CANCEL)

NV FNOD TNOD
CABLES ROUTED IN SEGMENT: 4 1397 2121 NO. CABLES: 13 PAGE: 1

L 681 1*
PL 410 1*
1ABN 67 1*
1PL 160 1*
1PL 3790 1*
1PL 3900 1*
2PL 160 1*
2PL 167 1*
2PL 3589 1*
2PL 3713 1*
2PL 3720 1*
2PL 3790 1*
2PL 3901 1*

SEGMENT RETRIEVED -- TYPE NEW SEGMENT ID OR PRESS ENTER FOR NEXT
ENTER TO PAGE, PF3 TO TOGGLE, ACTION CODE 'X' PLUS PF3 TO EXIT

QA REP[redacted] WATTS BAR NUCLEAR PLANT CONDUIT R[redacted] PAGE 1 DATE 12/16/90

	CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CS[redacted] ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	[redacted] STAT
B	1066	4	3.0 I	C	3	0.000	2.290	1.880	7.390	0.000	3.562	2		290	V

CABLES ROUTED IN CONDUIT:

2B	288	1*1	WDP	NC1: 2	CAB CSA: .940	CAB WT: 1.781	TOTAL CSA:	1.880	TOTAL WT:	3.562
TOTALS								1.880		3.562

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ATTACHMENT NO. UVA 2.1/2.4
WBNEEB-MS-TI15-0011, REV. 10

QA REP CONDUI ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CS ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	V ST
B 1067	4	3.0 I	C	3	0.000	2.290	1.880	7.390	0.000	3.562	2		290	V

CABLES ROUTED IN CONDUIT:

1B 288 1*1 WDP NC1: 2 CAB CSA: .940 CAB WT: 1.781 TOTAL CSA: 1.880 TOTAL WT: 3.562

TOTALS 1.880 3.562

QA REPO CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	STAT
B 1068	4	3.0 I	C	3	0.000	2.956	2.596	7.390	0.000	4.588	4		290	V

CABLES ROUTED IN CONDUIT:

B	120	1*1	WDN	NC1:	2	CAB CSA:	.649	CAB WT: 1.147	TOTAL CSA:	1.298	TOTAL WT:	2.294		
2B	276	1*1	WDN	NC1:	2	CAB CSA:	.649	CAB WT: 1.147	TOTAL CSA:	1.298	TOTAL WT:	2.294		
TOTALS										2.596		4.588		

QA REP [redacted] WATTS BAR NUCLEAR PLANT CONDUIT R[redacted] PAGE 4 DATE 12/16/90

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CS[redacted] ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	V STAT
B 1069	4	3.0 I	C	3	0.000	2.956	2.596	7.390	0.000	4.588	4		290	V

CABLES ROUTED IN CONDUIT:

B	116	1*1	WDN	NC1:	2	CAB CSA:	.649	CAB WT:	1.147	TOTAL CSA:	1.298	TOTAL WT:	2.294	
1B	276	1*1	WDN	NC1:	2	CAB CSA:	.649	CAB WT:	1.147	TOTAL CSA:	1.298	TOTAL WT:	2.294	
TOTALS											2.596		4.588	

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ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI15-0011, REV. 10

QA REPO [redacted] WATTS BAR NUCLEAR PLANT CONDUIT R[redacted] PAGE 5 DATE 12/16/90

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CS ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	V ST
B 1070	4	3.0 I	C	3	0.000	2.956	0.980	7.390	0.000	1.230	10		290	V

CABLES ROUTED IN CONDUIT:

B	146	1*2	WDE	NC1:	2	CAB CSA:	.098	CAB WT:	0.123	TOTAL CSA:	.196	TOTAL WT:	.246
1B	256	1*1	WDE	NC1:	2	CAB CSA:	.098	CAB WT:	0.123	TOTAL CSA:	.196	TOTAL WT:	.246
1B	258	1*1	WDE	NC1:	2	CAB CSA:	.098	CAB WT:	0.123	TOTAL CSA:	.196	TOTAL WT:	.246
2B	256	1*1	WDE	NC1:	2	CAB CSA:	.098	CAB WT:	0.123	TOTAL CSA:	.196	TOTAL WT:	.246
2B	258	1*1	WDE	NC1:	2	CAB CSA:	.098	CAB WT:	0.123	TOTAL CSA:	.196	TOTAL WT:	.246
TOTALS											.980		1.230

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ATTACHMENT NO. UVA 2.1/2.4
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WATTS BAR NUCLEAR PLANT CONDUIT R

PAGE 6 DATE 12/16/90

QA REP CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
B 1071	4	3.0 I	C	3	0.000	2.290	0.146	7.390	0.000	0.158	2		290	V

CABLES ROUTED IN CONDUIT:

B 144 1*2 WDD NC1: 2 CAB CSA: .073 CAB WT: 0.079 TOTAL CSA: .146 TOTAL WT: .158

TOTALS .146 .158

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ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI15-0011, REV. 10

	CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CS[redacted] ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	V STAT
B	1072	4	3.0 I	C	3	0.000	2.956	0.700	7.390	0.000	1.072	4		290	V

CABLES ROUTED IN CONDUIT:

2B	307	1*1	WDG	NC1:	2	CAB CSA:	.175	CAB WT: 0.268	TOTAL CSA:	.350	TOTAL WT:	.536	
2B	318	1*1	WDG	NC1:	2	CAB CSA:	.175	CAB WT: 0.268	TOTAL CSA:	.350	TOTAL WT:	.536	
TOTALS										.700		1.072	

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ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI15-0011, REV. 10

QA REPO — WATTS BAR NUCLEAR PLANT CONDUIT R — PAGE 8 DATE 12/16/90

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	V STAT
B 1073	4	3.0 I	C	3	0.000	3.916	0.000	7.390	0.000	0.000	0		290	V

CABLES ROUTED IN CONDUIT:

TOTALS	.000	.000

QA REP[redacted] CONDUI[redacted] ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CS[redacted] ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	V[redacted] STAT
B 1074	4	2.0 I	C	3	0.000	1.780	0.000	3.360	0.000	0.000	0		290	V

CABLES ROUTED IN CONDUIT:

TOTALS	.000	.000

WATTS BAR NUCLEAR PLANT CONDUIT R[illegible] PAGE 10 DATE 12/16/90

QA REPO CONDUI ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
B 1075	4	2.0 I	C	3	0.000	1.780	0.000	3.360	0.000	0.000	0		290	V

CABLES ROUTED IN CONDUIT:

TOTALS	.000	.000

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ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI15-0011, REV. 10

WATTS BAR NUCLEAR PLANT CONDUIT R

PAGE 11 DATE 12/16/90

QA REPO CONDUI ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	V STAT
B 1076	4	2.0 I	C	3	0.000	1.780	0.000	3.360	0.000	0.000	0		290	V

CABLES ROUTED IN CONDUIT:

TOTALS	.000	.000

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ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI15-0011, REV. 10

QA REF CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CS[redacted] ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	U STR
B 1077	3	2.0 I	C	3	0.000	1.041	0.150	3.360	0.000	0.186	2		290	V

CABLES ROUTED IN CONDUIT:

B	149	1*2	WDD-1	NC1:	2	CAB CSA:	.075	CAB WT: 0.093	TOTAL CSA:	.150	TOTAL WT:	.186
TOTALS										.150		.186

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CS ACCU	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	V ST
B 1200	4	3.0 I	C	3	0.000	2.956	2.596	7.390	0.000	4.588	4		290	V

CABLES ROUTED IN CONDUIT:

B	119	1*1	WDN	NC1:	2	CAB CSA:	.649	CAB WT: 1.147	TOTAL CSA:	1.298	TOTAL WT:	2.294	
2B	275	1*1	WDN	NC1:	2	CAB CSA:	.649	CAB WT: 1.147	TOTAL CSA:	1.298	TOTAL WT:	2.294	
TOTALS										2.596		4.588	

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CS ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	STAT
B 1201	4	3.0 I	C	3	0.000	2.956	2.596	7.390	0.000	4.588	4		290	V

CABLES ROUTED IN CONDUIT:

B	115	1*1	WDN	NC1:	2	CAB CSA:	.649	CAB WT: 1.147	TOTAL CSA:	1.298	TOTAL WT:	2.294		
1B	275	1*1	WDN	NC1:	2	CAB CSA:	.649	CAB WT: 1.147	TOTAL CSA:	1.298	TOTAL WT:	2.294		
TOTALS										2.596		4.588		

	CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	STAT
B	1202	4	3.0 I	C	3	0.000	2.290	1.880	7.390	0.000	3.562	2		290	V

CABLES ROUTED IN CONDUIT:

2B	287	1*1	WDP	NC1:	2	CAB CSA:	.940	CAB WT: 1.781	TOTAL CSA:	1.880	TOTAL WT: 3.562
TOTALS										1.880	3.562

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ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI15-0011, REV. 10

QA REPO — WATTS BAR NUCLEAR PLANT CONDUIT R — PAGE 16 DATE 12/16/90

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
B 1203	4	3.0 I	C	3	0.000	2.290	1.880	7.390	0.000	3.562	2		290	V

CABLES ROUTED IN CONDUIT:

1B 287 1*1 WDP NC1: 2 CAB CSA: .940 CAB WT: 1.781 TOTAL CSA: 1.880 TOTAL WT: 3.562

TOTALS 1.880 3.562

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ATTACHMENT NO. UVA 2.1/2.4
WBNEEB-MS-TI15-0011, REV. 10

	CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
B	1204	4	3.0 I	C	3	0.000	2.290	0.896	7.390	0.000	1.600	2		290	V

CABLES ROUTED IN CONDUIT:

B 140 1*2 WDK NC1: 2 CAB CSA: .448 CAB WT: 0.800 TOTAL CSA: .896 TOTAL WT: 1.600

TOTALS .896 1.600

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ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI15-0011, REV. 10

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CS ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	V STAT
B 1205	4	3.0 I	C	3	0.000	2.956	0.700	7.390	0.000	1.072	4		290	V

CABLES ROUTED IN CONDUIT:

1B	307	1*1	WDG	NC1:	2	CAB CSA:	.175	CAB WT: 0.268	TOTAL CSA:	.350	TOTAL WT:		.536
1B	318	1*1	WDG	NC1:	2	CAB CSA:	.175	CAB WT: 0.268	TOTAL CSA:	.350	TOTAL WT:		.536
TOTALS										.700			1.072

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
B 1206	4	3.0 I	C	3	0.000	2.290	0.146	7.390	0.000	0.158	2		290	V

CABLES ROUTED IN CONDUIT:

B	143	1*2	WDD	NC1:	2	CAB CSA:	.073	CAB WT: 0.079	TOTAL CSA:	.146	TOTAL WT: .158
	TOTALS									.146	.158

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ATTACHMENT NO. UVA 2.1/2.4
WBNEEB-MS-TI15-0011, REV. 10

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	V STAT
B 1207	4	3.0 I	C	3	0.000	2.956	0.980	7.390	0.000	1.230	10		290	V

CABLES ROUTED IN CONDUIT:

B	147	1*2	WDE	NC1:	2	CAB CSA:	.098	CAB WT:	0.123	TOTAL CSA:	.196	TOTAL WT:	.246	
1B	255	1*1	WDE	NC1:	2	CAB CSA:	.098	CAB WT:	0.123	TOTAL CSA:	.196	TOTAL WT:	.246	
1B	257	1*1	WDE	NC1:	2	CAB CSA:	.098	CAB WT:	0.123	TOTAL CSA:	.196	TOTAL WT:	.246	
2B	255	1*1	WDE	NC1:	2	CAB CSA:	.098	CAB WT:	0.123	TOTAL CSA:	.196	TOTAL WT:	.246	
2B	257	1*1	WDE	NC1:	2	CAB CSA:	.098	CAB WT:	0.123	TOTAL CSA:	.196	TOTAL WT:	.246	
TOTALS											.980		1.230	

WATTS BAR NUCLEAR PLANT CONDUIT RE

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QA REFC CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
B 1208	4	2.0 I	C	3	0.000	1.780	0.000	3.360	0.000	0.000	0		290	V

CABLES ROUTED IN CONDUIT:

TOTALS	.000	.000

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	QA REPO CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
B	1209	4	2.0 I	C	3	0.000	1.780	0.000	3.360	0.000	0.000	0		290	V

CABLES ROUTED IN CONDUIT:

TOTALS	.000	.000

QA REP CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	STAT
B 1210	4	2.0 I	C	3	0.000	1.780	0.000	3.360	0.000	0.000	0		290	V

CABLES ROUTED IN CONDUIT:

TOTALS	.000	.000

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
B 1211	3	2.0 I	C	3	0.000	1.041	0.150	3.360	0.000	0.186	2		290	V

CABLES ROUTED IN CONDUIT:

B 148 1*2 WDD-1 NC1: 2 CAB CSA: .075 CAB WT: 0.093 TOTAL CSA: .150 TOTAL WT: .186

TOTALS .150 .186

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CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VER STAT
B 1231	4	3.0 P	C	55	0.000	2.290	2.712	7.390	0.000	5.254	2		290	V

CABLES ROUTED IN CONDUIT:

B	84	1*1	WDQ	NC1:	2	CAB CSA:	1.356	CAB WT: 2.627	TOTAL CSA:	2.712	TOTAL WT: 5.254
TOTALS										2.712	5.254

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ATTACHMENT NO. UVA 2.1/2.4
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	CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CS[redacted] ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	V STAT
B	1232	4	3.0 P	C	55	0.000	2.290	2.712	7.390	0.000	5.254	2		290	V

CABLES ROUTED IN CONDUIT:

B	83	1*1	WDQ	NC1: 2	CAB CSA: 1.356	CAB WT: 2.627	TOTAL CSA:	2.712	TOTAL WT:	5.254
TOTALS								2.712		5.254

QA REP[redacted] WATTS BAR NUCLEAR PLANT CONDUIT R[redacted] PAGE 27 DATE 12/16/90

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
B 1233	4	3.0 P	C	55	0.000	2.290	2.712	7.390	0.000	5.254	2		290	V

CABLES ROUTED IN CONDUIT:

B	88	1*1	WDQ	NC1: 2	CAB CSA: 1.356	CAB WT: 2.627	TOTAL CSA:	2.712	TOTAL WT:	5.254
TOTALS								2.712		5.254

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ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI15-0011, REV. 10

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
B 1234	4	3.0 P	C	55	0.000	2.290	2.712	7.390	0.000	5.254	2		290	V

CABLES ROUTED IN CONDUIT:

B 89 1*1 WDQ NC1: 2 CAB CSA: 1.356 CAB WT: 2.627 TOTAL CSA: 2.712 TOTAL WT: 5.254

TOTALS 2.712 5.254

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ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI15-0011, REV. 10

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
B 1235	4	3.0 P	C	55	0.000	2.290	2.712	7.390	0.000	5.254	2		290	V

CABLES ROUTED IN CONDUIT:

B	93	1*1	WDQ	NC1:	2	CAB CSA:	1.356	CAB WT: 2.627	TOTAL CSA:	2.712	TOTAL WT:	5.254
TOTALS										2.712		5.254

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ATTACHMENT NO. UVA 2.1/2.4
WBNEEB-MS-TI15-0011, REV. 10

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	V STAT
B 1236	4	3.0 P	C	55	0.000	2.290	2.712	7.390	0.000	5.254	2		290	V

CABLES ROUTED IN CONDUIT:

B	94	1*1	WDQ	NC1:	2	CAB CSA:	1.356	CAB WT: 2.627	TOTAL CSA:	2.712	TOTAL WT:	5.254
TOTALS										2.712		5.254

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ATTACHMENT NO. UVA 2.1/2.4
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CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VER STAT
B 1237	4	3 0 5	C	55	0.000	2.290	2.712	7.390	0.000	5.254	2		290	V

CABLES ROUTED IN CONDUIT:

B	98	1*1	WDQ	NC1:	2	CAB CSA:	1.356	CAB WT:	2.627	TOTAL CSA:	2.712	TOTAL WT:	5.254
TOTALS											2.712		5.254

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ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI15-0011, REV. 10

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
B 1238	4	3.0 P	C	55	0.000	2.290	2.712	7.390	0.000	5.254	2		290	V

CABLES ROUTED IN CONDUIT:

B	99	1*1	WDQ	NC1: 2	CAB CSA: 1.356	CAB WT: 2.627	TOTAL CSA:	2.712	TOTAL WT:	5.254
TOTALS								2.712		5.254

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ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI15-0011, REV. 10

QA REP CONDUI ID		NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CS ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	V STAT
B	1223	4	3.0 P	C	25	0.000	2.290	2.712	7.390	0.000	5.254	2		291	V

CABLES ROUTED IN CONDUIT:

B 84 1*1 WDQ NC1: 2 CAB CSA: 1.356 CAB WT: 2.627 TOTAL CSA: 2.712 TOTAL WT: 5.254

TOTALS 2.712 5.254

	CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
B	1224	4	3.0 P	C	25	0.000	2.290	2.712	7.390	0.000	5.254	2		291	V

CABLES ROUTED IN CONDUIT:

B 83 1*1 WDQ NC1: 2 CAB CSA: 1.356 CAB WT: 2.627 TOTAL CSA: 2.712 TOTAL WT: 5.254

TOTALS 2.712 5.254

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	CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
B	1225	4	3.0 P	C	25	0.000	2.290	2.712	7.390	0.000	5.254	2		291	V

CABLES ROUTED IN CONDUIT:

B 88 1*1 WDQ NC1: 2 CAB CSA: 1.356 CAB WT: 2.627 TOTAL CSA: 2.712 TOTAL WT: 5.254

TOTALS 2.712 5.254

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ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI15-0011, REV. 10

QA REPO — WATTS BAR NUCLEAR PLANT CONDUIT R — PAGE 36 DATE 12/16/90

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
B 1226	4	3.0 P	C	25	0.000	2.290	2.712	7.390	0.000	5.254	2		291	V

CABLES ROUTED IN CONDUIT:

B 89 1*1 WDQ NC1: 2 CAB CSA: 1.356 CAB WT: 2.627 TOTAL CSA: 2.712 TOTAL WT: 5.254

TOTALS 2.712 5.254

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ATTACHMENT NO. UVA 2.1/2.4
WBNEEB-MS-TI15-0011, REV. 10

QA REP[illegible] WATTS BAR NUCLEAR PLANT CONDUIT R[illegible] PAGE 37 DATE 12/16/90

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE[illegible] STAT
B 1227	4	3.0 P	C	25	0.000	2.290	2.712	7.390	0.000	5.254	2		291	V

CABLES ROUTED IN CONDUIT:

B 94 1*1 WDQ NC1: 2 CAB CSA: 1.356 CAB WT: 2.627 TOTAL CSA: 2.712 TOTAL WT: 5.254

TOTALS 2.712 5.254

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ATTACHMENT NO. UVA 2.1/2.4
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CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	STAT
B 1228	4	3.0 P	C	25	0.000	2.290	2.712	7.390	0.000	5.254	2		291	V

CABLES ROUTED IN CONDUIT:

B 93 1*1 WDQ NC1: 2 CAB CSA: 1.356 CAB WT: 2.627 TOTAL CSA: 2.712 TOTAL WT: 5.254

TOTALS 2.712 5.254

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ATTACHMENT NO. UVA 2.1/2.4
W8NEEB-MS-TI15-0011, REV. 10

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CS[redacted] ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	[redacted] STAT
B 1229	4	3.0 P	C	25	0.000	2.290	2.712	7.390	0.000	5.254	2		291	V

CABLES ROUTED IN CONDUIT:

B 98 1*1 WDQ NC1: 2 CAB CSA: 1.356 CAB WT: 2.627 TOTAL CSA: 2.712 TOTAL WT: 5.254

TOTALS 2.712 5.254

QA REP CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	V STAT
B 1230	4	3.0 P	C	25	0.000	2.290	2.712	7.390	0.000	5.254	2		291	V

CABLES ROUTED IN CONDUIT:

B 99 1*1 WDQ NC1: 2 CAB CSA: 1.356 CAB WT: 2.627 TOTAL CSA: 2.712 TOTAL WT: 5.254

TOTALS 2.712 5.254

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ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI15-0011, REV. 10

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
B 1253	4	3.0 P	C	5	0.000	2.290	2.712	7.390	0.000	5.254	2		292	V

CABLES ROUTED IN CONDUIT:

B 84 1*1 WDQ NC1: 2 CAB CSA: 1.356 CAB WT: 2.627 TOTAL CSA: 2.712 TOTAL WT: 5.254

TOTALS 2.712 5.254

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ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI15-0011, REV. 10

QA REP[illegible] WATTS BAR NUCLEAR PLANT CONDUIT R[illegible] PAGE 42 DATE 12/16/90

	CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	STAT
B	1252	4	3.0 P	C	5	0.000	2.290	2.712	7.390	0.000	5.254	2		292	V

CABLES ROUTED IN CONDUIT:

B 83 1*1 WDQ NC1: 2 CAB CSA: 1.356 CAB WT: 2.627 TOTAL CSA: 2.712 TOTAL WT: 5.254

TOTALS 2.712 5.254

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ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI15-0011, REV. 10

QA REP[redacted] WATTS BAR NUCLEAR PLANT CONDUIT R[redacted] PAGE 43 DATE 12/16/90

QA	CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CS[redacted] ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	[redacted] STAT
B	1254	4	3.0 P	C	5	0.000	2.290	2.712	7.390	0.000	5.254	2		292	V

CABLES ROUTED IN CONDUIT:

B	88	1*1	WDQ	NC1:	2	CAB CSA:	1.356	CAB WT: 2.627	TOTAL CSA:	2.712	TOTAL WT: 5.254
TOTALS										2.712	5.254

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ATTACHMENT NO. UVA 2.1/2.4
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QA REP CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CS[redacted] ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	V STAT
B 1255	4	3.0 P	C	5	0.000	2.290	2.712	7.390	0.000	5.254	2		292	V

CABLES ROUTED IN CONDUIT:

B 89 1*1 WDQ NC1: 2 CAB CSA: 1.356 CAB WT: 2.627 TOTAL CSA: 2.712 TOTAL WT: 5.254

TOTALS 2.712 5.254

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ATTACHMENT NO. UVA 2.1/2.4
W8NEEB-MS-TI15-0011, REV. 10

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CS[illegible] ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	[illegible] STAT
B 1285	4	3.0 P	C	20	0.000	2.290	2.712	7.390	0.000	5.254	2		292	V

CABLES ROUTED IN CONDUIT:

B 93 1*1 WDQ NC1: 2 CAB CSA: 1.356 CAB WT: 2.627 TOTAL CSA: 2.712 TOTAL WT: 5.254

TOTALS 2.712 5.254

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ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI15-0011, REV. 10

QA REF CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	STAT
B 1286	4	3.0 P	C	20	0.000	2.290	2.712	7.390	0.000	5.254	2		292	V

CABLES ROUTED IN CONDUIT:

B 94 1*1 WDQ NC1: 2 CAB CSA: 1.356 CAB WT: 2.627 TOTAL CSA: 2.712 TOTAL WT: 5.254

TOTALS 2.712 5.254

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ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI15-0011, REV. 10

QA REP [redacted] WATTS BAR NUCLEAR PLANT CONDUIT [redacted] PAGE 47 DATE 12/16/90

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CS ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	V STAT
B 1280	4	3.0 P	C	20	0.000	2.290	2.712	7.390	0.000	5.254	2		292	V

CABLES ROUTED IN CONDUIT:

B 98 1*1 WDQ NC1: 2 CAB CSA: 1.356 CAB WT: 2.627 TOTAL CSA: 2.712 TOTAL WT: 5.254

TOTALS 2.712 5.254

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ATTACHMENT NO. UVA 2.1/2.4
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QA REPO — WATTS BAR NUCLEAR PLANT CONDUIT R — PAGE 48 DATE 12/16/90

	CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
B	1281	4	3.0 P	C	20	0.000	2.290	2.712	7.390	0.000	5.254	2		292	V

CABLES ROUTED IN CONDUIT:

B 99 1*1 WDQ NC1: 2 CAB CSA: 1.356 CAB WT: 2.627 TOTAL CSA: 2.712 TOTAL WT: 5.254

TOTALS 2.712 5.254

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ATTACHMENT NO. UVA 2.1/2.4
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CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CS[redacted] ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	[redacted] STAT
PLC 2472	4	1.5 I	C	70	0.000	1.081	0.213	2.040	0.000	0.246	1		290	V

CABLES ROUTED IN CONDUIT:

PL	4407	1*1	WFC-1	NC1:	1	CAB CSA:	.213	CAB WT: 0.246	TOTAL CSA:	.213	TOTAL WT:	.246
	TOTALS									.213		.246

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ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI15-0011, REV. 10

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	STAT
PLC 3140	4	1.5 I	C	60	0.000	.632	1.017	2.040	0.000	1.265	2		290	V

CABLES ROUTED IN CONDUIT:

ABN	755	1*1	WFA-4	NC1:	1	CAB CSA:	0.377	CAB WT: 0.430	TOTAL CSA:	.377	TOTAL WT:	.430
PL	6280	1*1	WFA-2	NC1:	1	CAB CSA:	.640	CAB WT: 0.835	TOTAL CSA:	.640	TOTAL WT:	.835
	TOTALS									1.017		1.265

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ATTACHMENT NO. UVA 2.1/2.4
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QA REPO — WATTS BAR NUCLEAR PLANT CONDUIT R — PAGE 51 DATE 12/16/90

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
PLC 3141	4	1.5 I	C	60	0.000	.632	1.017	2.040	0.000	1.265	2		290	V

CABLES ROUTED IN CONDUIT:

PL	6041	1*1	WFA-4	NC1:	1	CAB CSA:	0.377	CAB WT: 0.430	TOTAL CSA:	000.377	TOTAL WT:	000.430
PL	6281	1*1	WFA-2	NC1:	1	CAB CSA:	.640	CAB WT: 0.835	TOTAL CSA:	.640	TOTAL WT:	.835
	TOTALS									1.017		1.265

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ATTACHMENT NO. UVA2.1/2.4
WBNEEB-MS-TI15-0011, REV.10

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
PLC 3781	4	2.0 I	C	56	0.000	1.041	.754	3.360	0.000	.860	2		290	V

CABLES ROUTED IN CONDUIT:

PL	6340	1*1	WFA-4	NC1:	1	CAB CSA:	0.377	CAB WT:	0.430	TOTAL CSA:	.377	TOTAL WT:	.430	
PL	6341	1*1	WFA-4	NC1:	1	CAB CSA:	0.377	CAB WT:	0.430	TOTAL CSA:	.377	TOTAL WT:	.430	
	TOTALS										.754			.860

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ATTACHMENT NO. UVA 2.1/2.4
WBNEEB-MS-TI15-0011, REV. 10

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VER STAT
PLC 3137	4	1.5 I	C	35	0.000	.632	1.017	2.040	0.000	1.265	2		291	V

CABLES ROUTED IN CONDUIT:

ABN	755	1*1	WFA-4	NC1:	1	CAB CSA:	0.377	CAB WT:	0.430	TOTAL CSA:	.377	TOTAL WT:	.430	
PL	6280	1*1	WFA-2	NC1:	1	CAB CSA:	.640	CAB WT:	0.835	TOTAL CSA:	.640	TOTAL WT:	.835	
TOTALS											1.017			1.265

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ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI15-0011, REV. 10

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	STAT
PLC 3138	4	1.5 I	C	35	0.000	.632	1.017	2.040	0.000	1.265	2		291	V

CABLES ROUTED IN CONDUIT:

PL	6041	1*1	WFA-4	NC1:	1	CAB CSA:	0.377	CAB WT: 0.430	TOTAL CSA:	000.377	TOTAL WT: 000.430
PL	6281	1*1	WFA-2	NC1:	1	CAB CSA:	.640	CAB WT: 0.835	TOTAL CSA:	.640	TOTAL WT: .835
	TOTALS									1.017	1.265

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ATTACHMENT NO. UVA 2.1/2.4
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QA REP[illegible] WATTS BAR NUCLEAR PLANT CONDUIT R[illegible] PAGE 55 DATE 12/16/90

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CS[illegible] ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	V STAT
PLC 3780	4	2.0 I	C	19	0.000	1.041	.754	3.360	0.000	.860	2		291	V

CABLES ROUTED IN CONDUIT:

PL	6340	1*1	WFA-4	NC1:	1	CAB CSA:	0.377	CAB WT:	0.430	TOTAL CSA:	.377	TOTAL WT:	.430
PL	6341	1*1	WFA-4	NC1:	1	CAB CSA:	0.377	CAB WT:	0.430	TOTAL CSA:	.377	TOTAL WT:	.430
	TOTALS										.754		.860

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ATTACHMENT NO. UVA 2.1/2.4
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CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
1PLC3656	4	3.0 I	C	50	0.000	2.956	1.642	7.390	0.000	3.012	5		290	V

CABLES ROUTED IN CONDUIT:

1PL	6660	1*1	WDG-1	NC1:	2	CAB CSA:	.173	CAB WT: 0.291	TOTAL CSA:	.346	TOTAL WT:	.582	
1PL	6661	1*1	WDK-1	NC1:	3	CAB CSA:	.432	CAB WT: 0.810	TOTAL CSA:	1.296	TOTAL WT:	2.430	
TOTALS										1.642		3.012	

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
2PLC3636	4	3.0 I	C	70	0.000	2.956	1.642	7.390	0.000	3.012	5		290	V

CABLES ROUTED IN CONDUIT:

2PL	6660	1*1	WDG-1	NC1:	2	CAB CSA:	.173	CAB WT: 0.291	TOTAL CSA:	.346	TOTAL WT:	.582	
2PL	6661	1*1	WDK-1	NC1:	3	CAB CSA:	.432	CAB WT: 0.810	TOTAL CSA:	1.296	TOTAL WT:	2.430	
TOTALS										1.642		3.012	

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
VC 1598	4A	3.0 I	C	0	0.000	3.916	.000	7.390	0.000	.000			292	V

CABLES ROUTED IN CONDUIT:

TOTALS	.000	.000

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
VC 1743	48	3.0 I	C	12	0.000	3.916	.339	7.390	0.000	.343	1		290	V

CABLES ROUTED IN CONDUIT:

ABN 2515 B 1*1 WHH-1 NC1: 1 CAB CSA: 0.339 CAB WT: 0.343 TOTAL CSA: .339 TOTAL WT: .343

TOTALS .339 .343

QA REPO CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VER STAT
VC 1740	4A	3.0 I	C	6	0.000	3.916	.163	7.390	0.000	.158	1		290	V

CABLES ROUTED IN CONDUIT:

ABN 2511 A 1*1 WGC-1 NC1: 1 CAB CSA: 0.163 CAB WT: 0.158 TOTAL CSA: .163 TOTAL WT: .158

TOTALS .163 .158

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
VC 1599	4B	3.0 I	C	0	0.000	2.290	.502	7.390	0.000	.501	2		292	V

CABLES ROUTED IN CONDUIT:

ABN	2511 A 1*1	WGC-1	NC1:	1	CAB CSA:	0.163	CAB WT:	0.158	TOTAL CSA:	.163	TOTAL WT:	.158
ABN	2515 B 1*1	WHH-1	NC1:	1	CAB CSA:	0.339	CAB WT:	0.343	TOTAL CSA:	.339	TOTAL WT:	.343
TOTALS										.502		.501

QA REPO WATTS BAR NUCLEAR PLANT CONDUIT RE PAGE 1 DATE 12/16/90

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
1PLC3881	4	1.5 I	C	15	0.000	.816	.495	2.040	0.000	.625	1	40	290	V

CABLES ROUTED IN CONDUIT:

1PL 3900 1*1 WFA-15 NC1: 1 CAB CSA: 0.495 CAB WT: 0.625 TOTAL CSA: 000.495 TOTAL WT: 000.625

TOTALS .495 .625

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CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
2PLC3880	4	1.5 I	C	15	0.000	.816	.495	2.040	0.000	.625	1	40	291	V

CABLES ROUTED IN CONDUIT:

2PL 3901 1*1 WFA-15 NC1: 1 CAB CSA: 0.495 CAB WT: 0.625 TOTAL CSA: 000.495 TOTAL WT: 000.625

TOTALS .495 .625

QA REP[redacted] WATTS BAR NUCLEAR PLANT CONDUIT R[redacted] PAGE 3 DATE 12/16/90

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	VE STAT
1PLC3882	4	1.5 I	C	15	0.000	.816	.495	2.040	0.000	.625	1	40	292	V

CABLES ROUTED IN CONDUIT:

1PL 3900 1*1 WFA-15 NC1: 1 CAB CSA: 0.495 CAB WT: 0.625 TOTAL CSA: 000.495 TOTAL WT: 000.625

TOTALS .495 .625

QA REP[redacted] WATTS BAR NUCLEAR PLANT CONDUIT R[redacted] PAGE 4 DATE 12/16/90

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	V STAT
2PLC3879	4	1.5 I	C	15	0.000	.816	.495	2.040	0.000	.625	1	40	290	V

CABLES ROUTED IN CONDUIT:

2PL 3901 1*1 WFA-15 NC1: 1 CAB CSA: 0.495 CAB WT: 0.625 TOTAL CSA: 000.495 TOTAL WT: 000.625

TOTALS .495 .625

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ATTACHMENT NO. UVA 2.1/2.4
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QA REPO — WATTS BAR NUCLEAR PLANT CONDUIT R — PAGE 7 DATE 12/16/90

CONDUIT ID	NV	CONDUIT SIZE	CON TYP	CON LENG	CSA LIMIT	CSA MAX	CSA ACCUM	CONDUIT CSA INS	WT/FT. LIMIT	WT/FT. ACCUM	NO. CAB	AMB TEMP	SYSTEM	V STAT
MC 694	4	3.0 I	C	120	0.000	2.290	.630	7.390	0.000	1.070	2	43	290	V

CABLES ROUTED IN CONDUIT:

1A 4665 1*1 WDJ-1 NC1: 2 CAB CSA: 0.315 CAB WT: 0.535 TOTAL CSA: 000.630 TOTAL WT: 001.070

TOTALS .630 1.070

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ATTACHMENT NO. UVA 2.1/2.4
WBN EEB-MS-TI15-0011, REV. 10

COMPUTED TJA DATE 4-5-91
CHECKED EJJ DATE 4/16/91

The purpose of this section of Attachment UVA2.1/2.4 is to identify Non-1E V4 cables which could possibly become associated with Class 1E cables by entering the Category 1 duct banks between the Auxiliary Building and (1) the Intake Pumping Station, or (2) the Diesel Generator Building, and evaluating their cable protection.

REFERENCES
References for this section consist of the drawings identified in Table 1 and 2 and:

Computerized Cable Reporting System (CCRS)
CCRS Conduit Report (B26910227412)
Ref. 3.65 of this calculation (Design Standard DS E12.6.3)
Ref. 3.66 of this calculation (Walkdown data)
Design Guide DG E12.6.2 (R0)
Westinghouse Circuit Breaker Type EHB Curve (Attached)
Cutler-Hammer Circuit Breaker Type FC Curve (Attached)
Field Verified Protective Device Data (Attached)

METHODOLOGY
The task was accomplished by completion of the following steps:

(1) Identifying V4 raceways which interface with the duct banks
(2) Identifying the cables within the raceways and their power sources
(3) Determining if the cables are presently addressed by the calculation and
(4) If not, identifying the cables protective device(s) and
(5) Analysis to determine the adequacy of cable protection

The details of steps 1 thru 5 are as follows:

(1) Refer to Table 2 of this Attachment.
The drawings noted in Table 2 and the referenced CCRS Conduit Report were reviewed to determine the manholes (MH) and associated V4 raceways listed (* denotes that the raceway is empty).

(2) Cables routed in the raceways were identified from the referenced CCRS Conduit Report. Cable data and power sources were extracted from CCRS and tabulated. Cable insulation temperature ratings were obtained from DS E12.6.3. See Table 1 for results of this step.

(3) The tabulation was compared with Appendix H of the calculation to determine if the cables were presently addressed and noted as such in Table 1.

(4) For cables not presently addressed in the calculation the protective device data was obtained from walkdown data (Ref. 3.66 of this calculation) or by field verification (attached) and tabulated in Table 1.

(5) Time-current plots were developed for the protective devices and cables using the referenced manufacturer's data and the cable thermal damage characteristics from Figure 1 of DG E12.6.2. Adjustment for 75C Degree cable insulation was accomplished by extracting a multiplier (Kt = 0.533) from Figure 2 of the standard (75 to 150C Degrees). The adequacy of cable protection is noted in the PASS/FAIL column of Table 1 (See RESULTS/CONCLUSIONS) which was determined based on these curves and/or Appendix A.

RESULTS/CONCLUSIONS (Refer to Table 1)

Circuits identified as PASS(1) require that the circuit breakers be periodically tested since they do not meet the criteria outlined in the calculation. Circuits identified as PASS require no further action.

DCN S-15905-A has been initiated to revise the following drawings and to correct discrepancies noted while verifying the protective devices (Refer to Table 1 for the correct field verified settings) and to update the Periodic Breaker Test Drawings.

45W745 (Compt 6A & 6B)
45B797-6B
45W743-1 (Compt 2B)
45B786-2B
45W743-2 (Compt 2B)
45B787-2B
45B710-series Periodic breaker test drawings for the boards/compartments identified in Table 1 as PASS(1)

ATTACHED SUPPORTING DOCUMENTATION

ATTACHMENT UVA2.1/2.4
WBN EEB-MS-TI15-0011
TABLE 1

COMPUTED TMB DATE 3-26-91
CHECKED EJJ DATE 4/16/91

CABLE	MK NO.	SIZE	INSULATION TEMP RTG	BOARD	PROT DEVICE	MFR	TRIP RTG	DWG REF	REV	PASS/ FAIL	NOTES
.29				0-MCC-226-1/5F1							CIRCUIT PRESENTLY ADDRESSED IN APPENDIX
.34				0-MCC-226-1/4F1							CIRCUIT PRESENTLY ADDRESSED IN APPENDIX
.306	WDH-1	#1/0	90C	0-LAC-233-25	EHB3020	W	20A	45W399-4	RJ,R12	PASS(1)	FIELD VERIFIED PROT DEVICE DATA ATTACHED
.525	WBS *	#4	75C	0-LAC-233-90	FC3020	C-H	20A	45W399-4	RJ,R12	PASS(1)	*SPLICED WITH WDF-1 (3-1C #4,90C) IN MH FIELD VERIFIED PROT DEV DATA ATTACHED
.526	WBQ	#8	75C	0-LAC-233-27	EHB3020	W	20A	45W399-4	RJ,R12	PASS(1)	FIELD VERIFIED PROT DEVICE DATA ATTACHED
.527	WBQ	#8	75C	0-LAC-233-27	EHB3020	W	20A	45W399-4	RJ,R12	PASS(1)	FIELD VERIFIED PROT DEVICE DATA ATTACHED
.528	WBQ	#8	75C	0-LAC-233-27	EHB3020	W	20A	45W399-4	RJ,R12	PASS(1)	FIELD VERIFIED PROT DEVICE DATA ATTACHED
.529	WBQ	#8	75C	0-LAC-233-23	EHB3030	W	30A	45W399-4	RJ,R12	PASS(1)	FIELD VERIFIED PROT DEVICE DATA ATTACHED
.534	WBS	#4	75C	0-LAC-233-25	EHB3020	W	20A	45W399-4	RJ,R12	PASS(1)	FIELD VERIFIED PROT DEVICE DATA ATTACHED
.535	WBS	#4	75C	0-LAC-233-25	EHB3020	W	20A	45W399-4	RJ,R12	PASS(1)	FIELD VERIFIED PROT DEVICE DATA ATTACHED
.542	WBS	#4	75C	0-LAC-233-25	EHB3020	W	20A	45W399-4	RJ,R12	PASS(1)	FIELD VERIFIED PROT DEVICE DATA ATTACHED
.561	WDD-1	#8	90C	0-LAC-233-25	EHB3020	W	20A	45W399-4	RJ,R12	PASS(1)	FIELD VERIFIED PROT DEVICE DATA ATTACHED
.568	WDD-1	#8	90C	0-LAC-233-27	EHB3020	W	20A	45W399-4	RJ,R12	PASS(1)	FIELD VERIFIED PROT DEVICE DATA ATTACHED
.569	WDD-1	#8	90C	0-LAC-233-23	EHB3020	W	20A	45W399-4	RJ,R12	PASS(1)	FIELD VERIFIED PROT DEVICE DATA ATTACHED
.570	WBS	#4	75C	0-LAC-233-23	EHB3020	W	20A	45W399-4	RJ,R12	PASS(1)	FIELD VERIFIED PROT DEVICE DATA ATTACHED
PL395				0-BD-206-1/3A							CIRCUIT PRESENTLY ADDRESSED IN APPENDIX (TO BE SPARE PER DCN M-15245-A)
PL801				0-MCC-208-A/4E2							CIRCUIT PRESENTLY ADDRESSED IN APPENDIX
PL80[redacted]				0-MCC-208-A/7F2							CIRCUIT PRESENTLY ADDRESSED IN APPENDIX
PL86[redacted]				0-MCC-208-A/5E2							CIRCUIT PRESENTLY ADDRESSED IN APPENDIX (TO BE SPARE PER DCN M-15245-A)
PL1240	WLO	#10	90C	0-MCC-218-1/2A	EF3-B030	ITE	30A	45B797-2A 45W797-1	RB,R1 RC,R2	PASS(1)	PROT DEV DATA FROM REF 3.66
PL1250	WLO	#10	90C	0-MCC-218-1/2B	EF3-B030	ITE	30A	45B797-2B 45W797-1	RB,R1 RC,R2	PASS(1)	PROT DEV DATA FROM REF 3.66
PL1260	WMJ	#6	90C	0-MCC-218-1/3A	EF3-B050	ITE	50A	45B797-3A 45W797-1	RB,R1 RC,R2	PASS(1)	PROT DEV DATA FROM REF 3.66
PL1280	WMJ	#6	90C	0-MCC-218-1/3B	EF3-B050	ITE	50A	45B797-3B 45W797-1	RB,R1 RC,R2	PASS(1)	PROT DEV DATA FROM REF 3.66
PL1295	WLO	#10	90C	0-MCC-218-1/4D	EF3-A025 @4	ITE	170A	45B797-4D 45W797-1	RC,R2 RC,R2	PASS(1)	PROT DEV DATA FROM REF 3.66
PL1324	WLO	#10	90C	0-MCC-218-1/5F1	EF3-B020	ITE	20A	45B797-5F 45W797-1	RG,R4 RC,R2	PASS(1)	PROT DEV DATA FROM REF 3.66
PL1335	WLO	#10	90C	0-MCC-218-1/3F1	EF3-B020	ITE	20A	45B797-3F 45N1699-5	RB,R0 RE,R8	PASS(1)	PROT DEV DATA FROM REF 3.66
PL2450	WLO	#10	90C	0-MCC-218-1/6A	EF3-A025 @3	ITE	125A	45B797-6A 45W797-1	RC,R2 RC,R2	PASS(1)	PROT DEV DATA FROM REF 3.66
PL2455	WLO	#10	90C	0-MCC-218-1/6B	EF3-A025 @HI	ITE	210A	45B797-6B 45W797-1	RB,R2 RC,R2	PASS(1)	PROT DEV DATA FROM REF 3.66
PL2480	WMB	#8	90C	0-MCC-218-1/6C	EF3-L050 @3	ITE	260A	45B797-6C 45W797-1	RC,R2 RC,R2	PASS(1)	PROT DEV DATA FROM REF 3.66
PL3060				0-MCC-208-A/3C1							CIRCUIT PRESENTLY ADDRESSED IN APPENDIX
PL3080	WDE-1	#6	90C	0-MCC-222-1/8C1	EF3-B020	ITE	20A	45B790-8C 45W399-5	RD,R2 RE,R5	PASS(1)	FIELD VERIFIED PROT DEVICE DATA ATTACHED
PL3105				0-MCC-208-A/9D2							CIRCUIT PRESENTLY ADDRESSED IN APPENDIX
PL3[redacted]				0-MCC-208-A/9E1							CIRCUIT PRESENTLY ADDRESSED IN APPENDIX
PL31[redacted]				0-MCC-208-A/9E2							CIRCUIT PRESENTLY ADDRESSED IN APPENDIX

COMPUTED TMB DATE 3-26-91
CHECKED EJJ DATE 4/16/91

ATTACHMENT UVA2.1/2.4
WBN EEB-MS-TI15-0011
TABLE 1

CABLE	MK NO.	SIZE	INSULATION TEMP RTG	BOARD	PROT DEVICE	TRIP MFR RTG	DWG REF	REV	PASS/ FAIL	NOTES
PL3109				0-MCC-208-A/9F1						CIRCUIT PRESENTLY ADDRESSED IN APPENDIX
PL4401	WFA-2	#4	90C	0-MCC-257-1/2E	EF3-B070	ITE 70A	45B772-2E 45W399-4	RD,R2 RJ,R12	PASS(1)	PROT DEV DATA FROM REF 3.66
PL4402	WDH-1	#1/0	90C	0-MCC-257-1/3C	EF3-B070	ITE 70A	45B772-3C 45W399-4	RD,R2 RJ,R12	PASS(1)	PROT DEV DATA FROM REF 3.66
PL4460	WFC-1	#10	90C	0-MCC-257-1/5A	EF3-B020	ITE 20A	45B772-5A 45W399-4	RD,R2 RJ,R12	PASS(1)	PROT DEV DATA FROM REF 3.66
PLR540				0-MCC-216-A/2B						CIRCUIT PRESENTLY ADDRESSED IN APPENDIX
PLR548				0-MCC-216-B/2B						CIRCUIT PRESENTLY ADDRESSED IN APPENDIX
PLW500				0-MCC-226-1/3A						CIRCUIT PRESENTLY ADDRESSED IN APPENDIX
PLW508				0-MCC-226-1/5B						CIRCUIT PRESENTLY ADDRESSED IN APPENDIX
PLW515				0-MCC-226-1/2C						CIRCUIT PRESENTLY ADDRESSED IN APPENDIX
RM700				0-MCC-226-1/5F1						CIRCUIT PRESENTLY ADDRESSED IN APPENDIX
1V3230				1-MCC-213-B2/12A-B						CIRCUIT PRESENTLY ADDRESSED IN APPENDIX
2V3230				2-MCC-213-A2/13B-A						CIRCUIT PRESENTLY ADDRESSED IN APPENDIX
PLR555				0-MCC-216-A/6F1						CIRCUIT PRESENTLY ADDRESSED IN APPENDIX
1PL1108				1-MCC-232-A/6F1-A						CIRCUIT PRESENTLY ADDRESSED IN APPENDIX
1PL3720				1-MCC-214-A1/3F2-A						CIRCUIT PRESENTLY ADDRESSED IN APPENDIX
2PL3720				2-MCC-214-A1/10F1-A						CIRCUIT PRESENTLY ADDRESSED IN APPENDIX
1PL1[illegible]				1-MCC-232-B/8F1-B						CIRCUIT PRESENTLY ADDRESSED IN APPENDIX
1PL[illegible]				1-MCC-214-B1/2F2-B						CIRCUIT PRESENTLY ADDRESSED IN APPENDIX
2PL3730				2-MCC-214-B1/2F1-B						CIRCUIT PRESENTLY ADDRESSED IN APPENDIX

COMPUTED R.J.Smith DATE 4/5/91
CHECKED WA Corbit DATE 4/5/91

TABLE 2
MANHOLE AND RACEWAY IDENTIFICATION
(* EMPTY RACEWAY)

15W810-1 R32, RG; -2 R21, RD

MH1		
PLC101	PLC131	MC2222*
PLC102	MC2220*	MC2342*

15W810-1 R32, RG; -3 R12, RB; -4 R7, RB

MH2	MH3
L1389	NONE

15W810-1 R32, RG; -3 R12, RB; -5 R7, RB; -6 R8, RA; -7 R11, RA; -23 R3, RA; -24 R3, RA

MH8B		MH6A	MH7A	MH7B	MH8A
L1383	MC2130*	PLC2097	MC2100	PLC2100	MC2078
L1403*	MC2375	PLC2101	PLC2117*	MC2124	PLW2210
L1404*				MC2125	PLC2168

MH4A, MH4B, MH5A, MH5B, MH6B, MH9B
NONE

15W810-1 R32, RG; -10 R16, RB

MH18	
PLR1180	PLR1182

15W810-1 R32, RG; -8 R15, RC; -10 R16, RB; -18 R6, RB

MH19	MH21	MH20, MH22, MH24	MH23	
PLC127	L1023	NONE	PLC2162	MC2524*
PLC2161	L1429		MC120	MC2525*
	L1430		MC2023*	L986
	L1431*		MC2024*	

MH25		MH26			MH27
L1020	L1427	VC783	MC2116	MC1997	VC781
L1426	L1428*	MC2111	MC1996		PLC2164

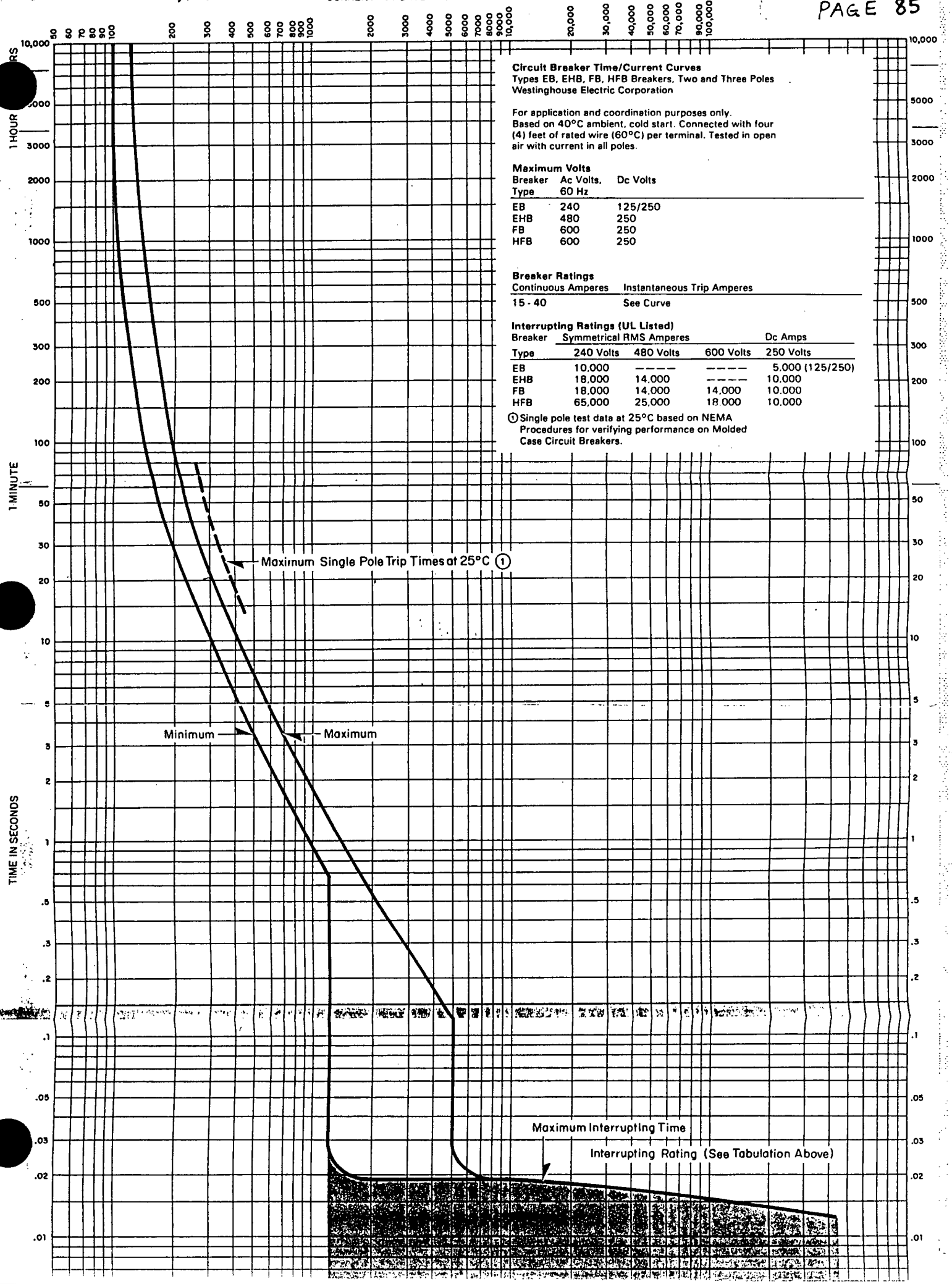
Bank to Diesel Generator Building
L1425*

DCN REVIEW

The following DCN's were reviewed for impact: M-08515-C, M-08852-A, M-10472-A, M-12106-A, M-15245-A, P-01212-B, P-06978-A, P-02147-A, E203663 R0.

ATTACHMENT UVA2.1/2.4 EB, EHD
VBN EEB-MS-TI15-0011, R11

Type EB: 15-40 Amperes, 2 and 3 Poles, 600 Volts Ac Max.
Type HFB: 15-40 Amperes, 2 and 3 Poles, 600 Volts Ac Max.



Circuit Breaker Time/Current Curves
Types EB, EHB, FB, HFB Breakers, Two and Three Poles
Westinghouse Electric Corporation

For application and coordination purposes only.
Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C) per terminal. Tested in open air with current in all poles.

Maximum Volts

Breaker Type	Ac Volts, 60 Hz	Dc Volts
EB	240	125/250
EHB	480	250
FB	600	250
HFB	600	250

Breaker Ratings

Continuous Amperes	Instantaneous Trip Amperes
15 - 40	See Curve

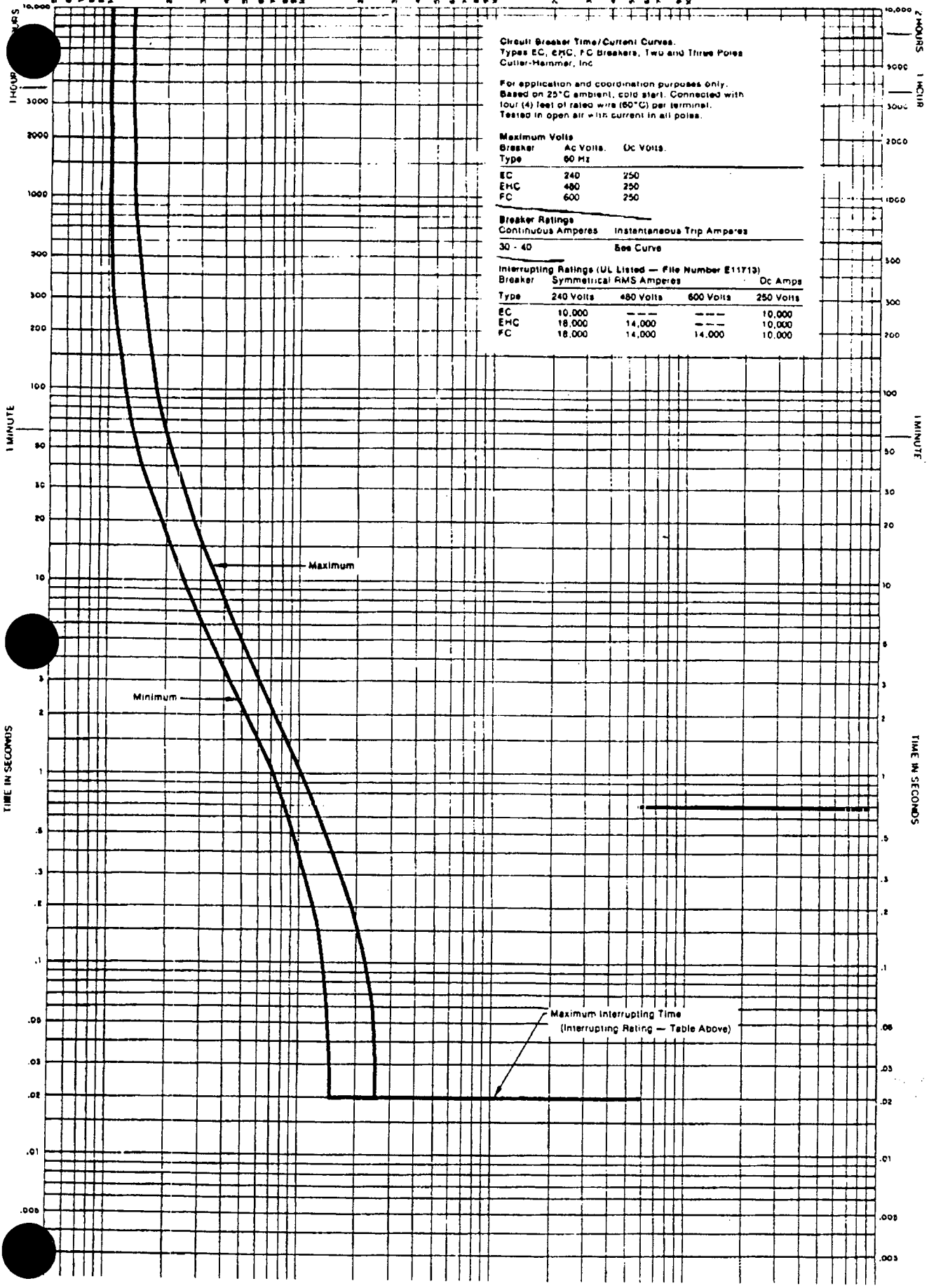
Interrupting Ratings (UL Listed)

Breaker	Symmetrical RMS Amperes			Dc Amps
Type	240 Volts	480 Volts	600 Volts	250 Volts
EB	10,000	----	----	5,000 (125/250)
EHB	18,000	14,000	----	10,000
FB	18,000	14,000	14,000	10,000
HFB	65,000	25,000	18,000	10,000

(1) Single pole test data at 25°C based on NEMA Procedures for verifying performance on Molded Case Circuit Breakers.

ATTACHMENT UVA2.1/2.4
WBN EEB-MS-TI15-0011, R11

CURRENT IN PERCENT OF BREAKER TRIP RATING



Circuit Breaker Time/Current Curves.
Types EC, EHC, FC Breakers, Two and Three Poles
Cutler-Hammer, Inc

For application and coordination purposes only.
Based on 25°C ambient, cold start. Connected with four (4) feet of rated wire (60°C) per terminal.
Tested in open air with current in all poles.

Maximum Volts

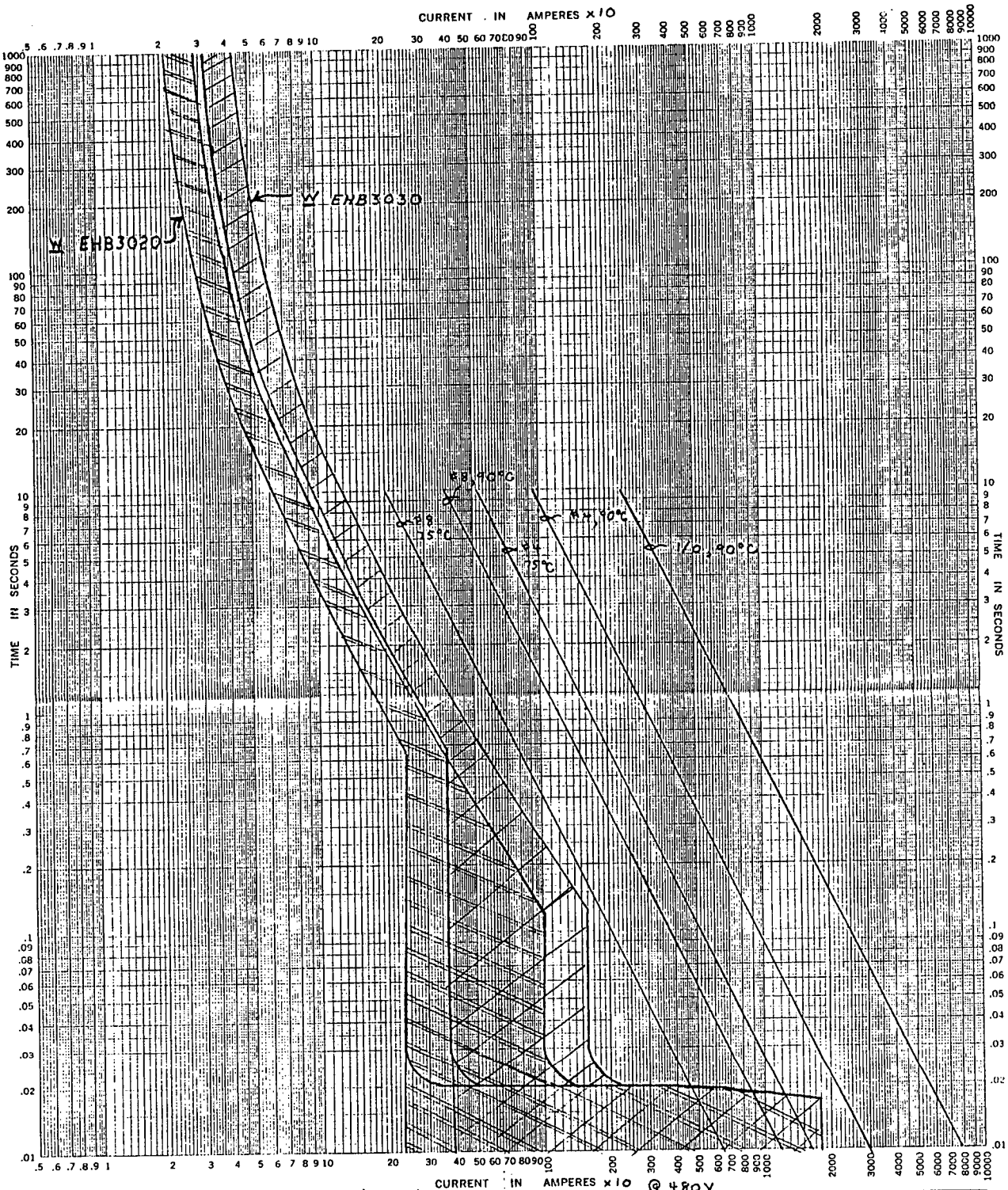
Breaker Type	Ac Volts, 60 Hz	Dc Volts
EC	240	250
EHC	480	250
FC	600	250

Breaker Ratings

Continuous Amperes	Instantaneous Trip Amperes
30 - 40	See Curve

Interrupting Ratings (UL Listed — File Number E11713)

Breaker	Symmetrical RMS Amperes			Dc Amps
Type	240 Volts	480 Volts	600 Volts	250 Volts
EC	10,000	---	---	10,000
EHC	18,000	14,000	---	10,000
FC	18,000	14,000	14,000	10,000



TIME-CURRENT CHARACTERISTIC CURVES

For _____ Fuse Links. In _____

BASIS FOR DATA Standards _____ Dated _____

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

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

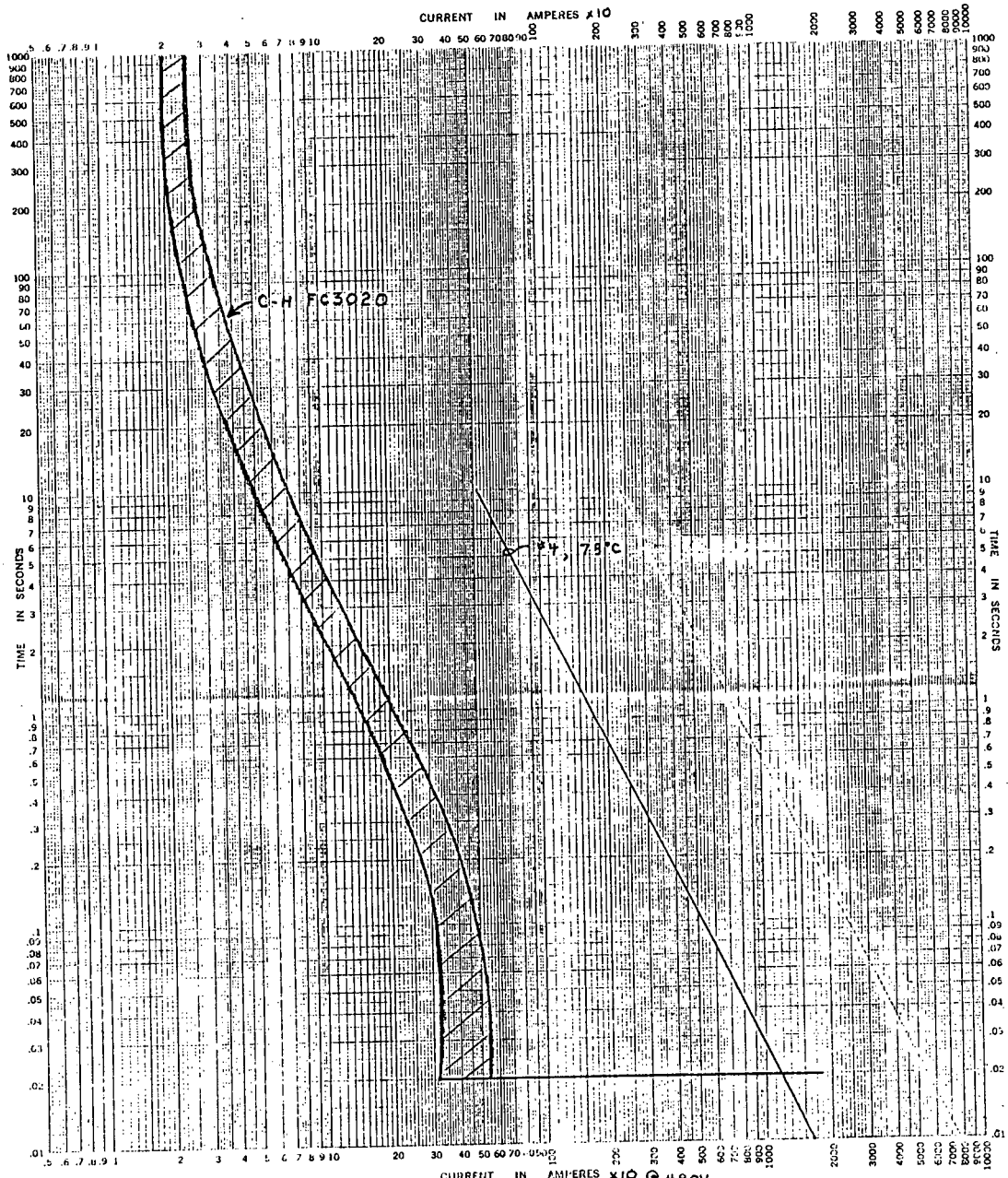
No. _____

Date _____

PREP TMB DATE 3-8-91

CHK EHH DATE 4/16/91

K-Σ TIME-CURRENT CHARACTERISTIC KEUFFEL & ESSER CO. MADE IN U.S.A. 48 5258



TIME-CURRENT CHARACTERISTIC CURVES

For: Fuse Links. In

BASIS FOR DATA Standards Dated

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

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

No.

Date

PREP FMB DATE 3-8-91

CHK EJJ DATE 4/16/91

FIELD VERIFIED DATA

BOARD/PANEL 0-LAC-233-90

BKR/FUSE	MFR.	TYPE/MODEL	RTG	ADDITIONAL DATA
NA 3-5-91	CUTTLER-HAMMER	FC3020	20A	BREAKER TO BE TAKEN FROM 0-DPL-251-1

PREP T M Barker DATE 3-5-91

CHK [illegible] DATE 3/5/91

FIELD VERIFIED DATA

BOARD/PANEL 0-LAC-233-25

BKR/FUSE	MFR.	TYPE/MODEL	RTG	ADDITIONAL DATA
#1 thru 10	W	EHB3020	20A	NA TMW 3-5-91

PREP T M Barker DATE 3-5-91

CHK Robert M. Grimes DATE 3/5/91

FIELD VERIFIED DATA

BOARD/PANEL O-LAC-233-23

BKR/FUSE	MFR.	TYPE/MODEL	RTG	ADDITIONAL DATA
#2	W	EHB3020	20A	VA TMB 3-5-91
#1	W	EHB3030	30A	

PREP T M Barker DATE 3-5-91

CHK Robert M. Zimmerly DATE 3/5/91

FIELD VERIFIED DATA

BOARD/PANEL 0-LAC-233-27

BKR/FUSE	MFR.	TYPE/MODEL	RTG	ADDITIONAL DATA
#1, 2, 3, 4	W	EHB3020	20A	NA TMB 3-5-91

PREP T M Barker DATE 3-5-91

CHK Robert M. Jones DATE 3/5/91

FIELD VERIFIED DATA

BOARD/PANEL O-MCC-222-1/8C1

BKR/FUSE	MFR.	TYPE/MODEL	RTG	ADDITIONAL DATA
COMPT 8C1	ITE	EF3-B020	20A	NA TMB 3-5-91

PREP T M Barker DATE 3-5-91

CHK Robert M Nemeth DATE 3/5/91

PREPARED: TMB DATE: 4-11-90
VERIFIED: [illegible] DATE: 4/11/90

PURPOSE

The purpose of this Attachment is to evaluate and support modifications to be implemented under DCN's M-08663-A and P-03065-B.

The modifications involve breaker and/or breaker setting changes and overload heater changes.

The following baseline calculations evaluate the DCN modifications for their impact. These evaluations are identified by the Attachment No. M08663A and are included in the calculation noted.

BASELINE CALCULATION	CALCULATION NO.
480VAC 1E COORDINATION/PROTECTION	WBN EEB-MS-TI08-0008
AUXILIARY POWER SYSTEM ANALYSIS	WBN-EEB-MS-TI06-0002
CONTAINMENT PENETRATION PROTECTION STUDY, VOLTAGE LEVEL V4 AND V5	EEB-MS-TI08-0015
480V NON-CLASS 1E POWER CABLE ASSOCIATED CIRCUITS	WBN EEB-MS-TI15-0011

PREPARED: TMB DATE: 4-9-90
VERIFIED: CWH DATE: 4/11/90

REFERENCE:

480VAC 1E COORDINATION/PROTECTION CALCULATION
WBN EEB-MS-TI08-0008, Rev. 1

SCOPE:

Attached are copies of the sheets H8, H9, H39, and H56 from Appendix H which have been marked to depict the changes to the protective devices identified in the referenced calculation for the following Systems Group 1 loads :

0-MTR-32-25	0-FCV-67-360
0-MTR-32-26	0-FCV-67-362

SUMMARY OF RESULTS / CONCLUSIONS

The protective device changes do not adversly impact this calculation based on the following:

0-MTR-32-25 & 0-MTR-32-26

The new settings are acceptable since they do not exceed the criteria for the maximum protective device rating for a 4/0 cable (established in Rev. 0 of the base calc, Appendix A, Page 4)

0-FCV-67-360 & 0-FCV-67-362

The new settings are acceptable since they do not exceed the criteria for the maximum protective device rating for a #12 cable (established in Rev. 0 of the base calc, Appendix A, Page A1).

Page H8 of H72

WBN EEB-MS- TI15-0011 RO
Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared B. H. Buchart Date 1/22/90 Checked [illegible] Date 1/26/90
B. H. Buchart 1/10/90 Bruce Kelley 1/25/90

1-BD-212-A2

COMPT No	SERVICE	BKR MODEL NO	SENSOR RATING	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
3D	0-MTR-32-25	DS-416	Y 300A	~~75~~ 76	Y ~~12~~ 4	N/A	N/A	Y ~~1000~~ 600	N/A	4/0	1PL5083 R
										4/0	1PL5085
7B	1-MTR-30-159	DS-206	300A	66	12	N/A	N/A	Y 900	Y CP 4/0 CS COULD SHORT OUT	4/0	1PL5150

Form GO 3081 Rev. 2 SL-F647 04/84

RI: COMPUTED TMB DATE 4-10-90
CHECKED [illegible] DATE 4/11/90

WBN EEB-MS- TI15-0011 RO
T[illegible]ation of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmgmundar Date 1/22/90 Checked R. H. Buchart Date 1/26/90
R. H. Buchart 1/10/90 Brown Kelley 1/25/90

1-BD-212-B1

COMPT No	SERVICE	BKR MODEL NO	SENSOR RATING	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO	
2B	1-MTR-30-102	DS-416	Y 300A	50	Y 7.5	N/A	N/A	Y 700	N/A	4/0	1PL5160	
3E	1-MTR-62-101	DS-416	Y 400A	75	Y 20	N/A	N/A	Y 1000	N/A.	400	1PL5025	
3D	0-MTR-32-26	DS-416	Y 300A	~~75~~ 76	Y ~~12~~ 4	N/A	N/A	Y ~~980~~ 600	N/A	400	1PL5089	RI

Form GO 3081 Rev. 2 SL-F647 04/84

COMPUTED TMB DATE 4-9-90

CHECKED WSH DATE 4/9/90

WBN EEB-MS-TI15-0011 RO

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Burhart Date 1/22/90
R.H. Burhart 1/10/90

Checked [illegible] Date 1/26/90
[illegible] 1/21/90

1-MCC-213-B2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	DL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO	
		EF3-		(A)		G30	MFR	MODEL	RATING			
4A	1-FCV-3-193	A010Z	3	Y45	1	T32	←	N/A	→	12	1V3290	
4B	1-FCV-3-194	A010Z	3	Y45	1	T32	←	N/A	→	12X2	1V3270	
12A	0-FCV-67-362	~~B010~~ A010	~~10~~ 2	~~Y27~~ 36	1	~~T20~~ T29	←	N/A	→	12	1V3230	R1

Form GO-3.08.1 Rev. 2 SL-F647 04/84

WBN EEB-MS-TI15-0011 R0

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared [illegible] Date 1/22/90 Checked R.H. Bruchert Date 1/26/90
[illegible] 1/16/90 Scott McKelley 1/25/90

2-MCC-213-A2

COMPT ND	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
4A	2-FCV-3-191	A010	3	Y 45	1	T31	N/A	N/A	N/A	12	2V3260
4B	2-FCV-3-192	A010	3	Y 45	1	T31	N/A	N/A	N/A	12x2	2V3280
13B	0-FCV-67-360	A010	~~1~~ 2	Y ~~27~~ 36	1	~~T28~~ T29	N/A	N/A	N/A	12	2V3230 R1

PREPARED: T M Barker DATE: 5-3-90
VERIFIED: S/A Peterson DATE: 5/7/90

PURPOSE

The purpose of this Attachment is to evaluate and support modifications to be implemented under DCN P-5297-A.

The modifications involve the addition of two Air Handling Units for the Computer Room HVAC.

The following baseline calculations evaluate the DCN modifications for their impact. Since different aspects of a design modification are evaluated or determined in the calculation controlling that particular feature, interfaces or references between the calculations are necessary. The evaluations for this modification are identified by "ATTACHMENT NO. P5297A" and are included in the following calculations.

BASELINE CALCULATION	CALCULATION NO.
480VAC 1E COORDINATION/PROTECTION	WBN EEB-MS-TI08-0008
AUXILIARY POWER SYSTEM ANALYSES	WBN-EEB-MS-TI06-0002
480V NON-CLASS 1E POWER CABLE ASSOCIATED CIRCUITS	WBN EEB-MS-TI15-0011
REG GUIDE 1.75 ASSOCIATED CIRCUIT and APPENDIX R ANALYSIS for NON-CLASS 1E 120V AC and 250VDC CIRCUITS	WBPEVAR9001006
CONTROL POWER TRANSFORMERS	WBN EEB-MS-TI02-0019
120V PROTECTION/COORDINATION	WBN EEB-MS-TI07-0018
TELAS	WBN EEB-MS-TI05-0001
CABLE AMPACITY - NV4 and NV5 CABLES in CLASS 1E RACEWAYS	WBPEVAR8909010

PREPARED: Tim Barker DATE: 5-3-90
VERIFIED: S Peterson DATE: 5/3/90

1.0 SCOPE

This attachment evaluates and verifies that the proposed design is adequate and meets the guidelines applicable to the baseline calculation.

The loads are proposed as additions to 480V Reactor Vent Boards 1A-A and 2B-B (compartment 11B on both boards).

2.0 ASSUMPTIONS

See "Assumptions" identified in the base calculation (Section 2.0).

3.0 SOURCES OF DESIGN INPUT / REFERENCES

3.1 TELAS, WBN EEB-MS-TI06-0001

3.2 Cable Ampacity - NV4 and NV5 Cables in Class 1E Raceways, WBPEVAR8909010

3.3 480VAC 1E Coordination/Protection, WBN EEB-MS-TI08-0008

4.0 DESIGN INPUT DATA

The proposed cable sizes are documented in Ref. 3.2.

Protective device data is documented in Ref 3.1 with the breaker settings documented in Ref 3.3.

5.0 JUSTIFICATION OF ASSUMPTIONS

See "Justification of Assumptions" in base calculation (Section 5.0).

6.0 METHODOLOGY

The protective devices are ITE circuit breakers Model No. EF3-A025 with an instantaneous setting of 3 (125 Amps) and Shawmut TRS30 (30 Amp) fuses.

PREPARED: T. M. Barber DATE: 5-8-90
VERIFIED: _____ DATE: _____

The minimum required cable size:

For a tray route: #6, WFA-3 or WFA-15
OR
For a conduit route: #10, WFC-1 or WFC-2

To provide adequate cable protection (per Appendix A of the base calculation) for these conductor sizes:

The magnetic circuit breaker trip rating (including tolerance) must be below the following settings.

#6: 550 Amps
#10: 225 Amps

The maximum fuse ratings are:

#6: TRS70
#10: TRS30

7.0 GRAPHICS

Not applicable.

8.0 SUMMARY OF RESULTS

The result of this analysis is that for the cable sizes selected, the proposed protective devices are at or below the maximum devices identified in Appendix A.

9.0 CONCLUSION

The cables are adequately protected by the protective devices (both the circuit breaker and fuse) identified in Section 6.0.

10.0 ATTACHMENTS

Not applicable.

PREPARED: T. M. B. DATE: 6-7-90
VERIFIED: EJF DATE: 6-8-90

PURPOSE

The purpose of this Attachment is to evaluate and support modifications to be implemented under DCN's M-10448-A (Group 2A) and M-10522-A (Groups 2B and 2C).

The modifications involve breaker and/or breaker setting and overload heater changes and incorporate data for cables to be replaced on DCN's M-10473-A (Train A) and M-10511-A (Train B).

The following baseline calculations evaluate the DCN modifications for their impact. These evaluations are identified by the Attachment No. M10448A and are included in the calculation noted.

BASELINE CALCULATION	CALCULATION NO.
480VAC 1E COORDINATION/PROTECTION	WBN EEB-MS-TI08-0008
AUXILIARY POWER SYSTEM ANALYSIS	WBN-EEB-MS-TI06-0002
CONTAINMENT PENETRATION PROTECTION STUDY, VOLTAGE LEVEL V4 AND V5	EEB-MS-TI08-0015
480V NON-CLASS 1E POWER CABLE ASSOCIATED CIRCUITS	WBN EEB-MS-TI15-0011
CABLE AMPACITY - NV4 and NV5 CABLES in CLASS 1E RACEWAYS	WBPEVAR8909010

PREPARED: TMB DATE: 6-7-90
VERIFIED: EJJ DATE: 6-8-90

1.0 SCOPE

This attachment addresses 480V Non-Class 1E protective device cable protection for System Group 2A, 2B, and 2C that receive power from the Class 1E boards listed within the base calculation.

2.0 ASSUMPTIONS

See Unverified Assumptions identified in the base calculation (Section 2.0, Page 8).

3.0 SOURCES OF DESIGN INPUT / REFERENCES

3.1 480VAC 1E Coordination/Protection, WBN EEB-MS-TI08-0008

4.0 DESIGN INPUT DATA

The Design input data consists of the following.

Protective device data was taken from Ref. 3.1

5.0 JUSTIFICATION OF ASSUMPTIONS

See Justification of Assumptions in base calculation (Section 5.0).

6.0 METHODOLOGY

The breaker types and settings (from Reference 3.1) were tabulated along with the cable sizes (See Section A).

The new breakers and/or settings were then evaluated to determine if the cable protection was adequate in accordance with the criteria established in the baseline calculation.

PREPARED: TMB DATE: 6-7-90
VERIFIED: EJS DATE: 6-8-90

7.0 GRAPHICS

Graphics for cable protection consists of the time-current plots contained in the baseline calculation.

8.0 SUMMARY OF RESULTS

The result of this analysis is that the protection for the 480V Non-Class 1E cables within the scope previously outlined have been determined to pass or fail as indicated in Section A.

9.0 CONCLUSION

All cables within the scope of this attachment are adequately protected.

The new breakers and/or settings supersede that contained in the baseline calculation.

10.0 SECTION REFERENCES

SECTION A - Tabulation of cables and circuit breaker modifications and/or settings

COMPUTED GMH DATE 6-13-90
CHECKED EJG DATE 6/13/90

ATTACHMENT NO. M10448A - SECTION A
WBN EEB-MS-TI15-0011
480V SHUTDOWN BOARDS
NON-CLASS 1E CIRCUITS

CMPT	LOAD	BKR TYPE	SENSOR	LDPU	LDTD	SDPU	SDTD	INST	CABLE NO	CABLE SZ	CABLE PROT	NOTES
*	480V SHDN BD 1A1-A											
2C	1-MTR-30-103		200	0.90	4			7	1PL5140	4/0	PASS	
*	480V SHDN BD 1A2-A											
7B	1-MTR-30-159		300	0.70	6			7	1PL5150	4/0	PASS	
*	480V SHDN BD 1B1-B											
2B	1-MTR-30-102		200	0.90	4			7	1PL5160	4/0	PASS	
3B	1-MTR-62-101		400	0.80	4			9	1PL5025	400	PASS	
*	480V SHDN BD 1B2-B											
7A	1-MTR-30-162		300	0.65	4			7	1PL5170	4/0	PASS	
*	480V SHDN BD 2A1-A											
2C	2-MTR-30-104		200	0.90	4			7	2PL5140	4/0	PASS	
*	480V SHDN BD 2A2-A											
7B	[redacted]MTR-30-274		300	0.65	4			7	2PL5150	4/0	PASS	
7C	[redacted]R-30-136		200	0.90	4			7	2PL5111	4/0	PASS	
*	480V SHDN BD 2B1-B											
2B	2-MTR-30-105		200	0.90	4			7	2PL5160	4/0	PASS	
*	480V SHDN BD 2B2-B											
7A	2-MTR-30-278		300	0.65	4			7	2PL5170	4/0	PASS	
7C	0-MTR-30-139		200	0.90	4			7	2PL5100	4/0	PASS	

COMPUTED TMT DATE 6-13-90
CHECKED EJG DATE 6/13/90

ATTACHMENT NO. M10448A - SECTION A
WBN EEB-MS-TI15-0011
480V CLASS 1E MOTOR CONTROL CENTERS
NON-CLASS 1E CIRCUITS

CMPT	LOAD	BKR TYPE	BREAKER SETTING	CABLE NO	CABLE SZ	CABLE PROT	NOTES
* C&A VENT BD 1A1-A							
13C	1-MTR-65-77	EF3-A025Z	2	1PL3645	#12	PASS	
* C&A VENT BD 1A2-A							
2A	0-MTR-31-339	EF3-A005	4	1PL2830	#12	PASS	
3A	1-MTR-30-25	EF3-A010	4	1PL2906	#12	PASS	
4A	1-MTR-30-283	EF3-A005	4	1PL3621	#12	PASS	
4B	0MTR-31-203/204	EF3-A025Z	3	V1920	#10	PASS	
5A	1-MTR-30-301	EF3-A010	4	1PL3435	#12	PASS	
8A	1-MTR-30-CRD	FJ3-B125	LO	1PL3692	2/0	PASS	
* C&A VENT BD 1B1-B							
12A	1-MTR-30-181	EF3-A010	4	1PL3021	#10	PASS	
13C	1-MTR-65-74	EF3-A025Z	2	1PL3660	#12	PASS	
* C&A VENT BD 1B2-B							
2B	0-MTR-31-418	EF3-A005	3	1PL3654	#12	PASS	
3B	1-MTR-30-284	EF3-A005	4	1PL3626	#12	PASS	
3C	1-MTR-30-66	EF3-A005	4	1PL3631	#12	PASS	
4B	1-MTR-30-302	EF3-A010	4	1PL3438	#12	PASS	
6B	1-MTR-30-26	EF3-A010	4	1PL2913	#12	PASS	
9A	1-MTR-30-CRB	FJ3-B125	LO	1PL3671	2/0	PASS	
* C&A VENT BD 2A2-A							
4A	2-MTR-30-67	EF3-A005	HI	2PL3621	#12	PASS	
* DSL AUX BD 1A1-A							
6A	1-MTR-30-463	EF3-A005	HI	PL2235	#12	PASS	
* DSL AUX BD 1A2-A							
6A	0-MTR-30-470	EF3-A005	4	PL2572	#12	PASS	
* DSL AUX BD 1B1-B							
6A	1-MTR-30-465	EF3-A005	HI	PL2249	#12	PASS	
* DSL AUX BD 2A1-A							
6A	2-MTR-30-464	EF3-A005	HI	PL2242	#12	PASS	
* DSL AUX BD 2B1-B							
6A	2-MTR-30-466	EF3-A005	HI	PL2255	#12	PASS	
* DSL AUX BD C2-S							
CA	0-MTR-30-329			PL3308	#12	PASS	SHAWMUT TRS1.5R 1.5A FUSES
EA	0-MTR-30-327			PL3316	#12	PASS	SHAWMUT TRS3R 3A FUSES

COMPUTED KMB DATE 6-13-90
CHECKED EJJ DATE 6/13/90

ATTACHMENT NO. M10448A - SECTION A
WBN EEB-MS-TI15-0011
480V CLASS 1E MOTOR CONTROL CENTERS
NON-CLASS 1E CIRCUITS

CMPT	LOAD	BKR TYPE	BREAKER SETTING	CABLE NO	CABLE SZ	CABLE PROT	NOTES
* RMOV BD 1A1-A							
16A	1-MTR-31-265	EF3-A010	4	1PL6300	#10	PASS	
16F2	1-MTR-31-303/2	EF3-B020		1PL6289	#10	PASS	
18C	1-MTR-31-303/1	EF3-A010	4	1PL6281	#12	PASS	
* RMOV BD 1B1-B							
16A	1-MTR-31-266	EF3-A010	4	1PL6310	#10	PASS	
17F2	1-MTR-31-324/2	EF3-B020		1PL6291	#10	PASS	
18C	1-MTR-31-324/1	EF3-A010	4	1PL6285	#10	PASS	
* RX VENT BD 1A-A							
5A	0-MTR-31-406	EF3-A005	3	1PL644	#12	PASS	
6A	0-MTR-31-25	EF3-A010	4	1PL735	#12	PASS	
9B	1-MTR-30-95	EF3-A025	LO	1PL520	#10	PASS	
				1PL521	#12		
10B	1-MTR-30-99	EF3-A025	LO	1PL550	#10	PASS	
				1PL551	#12		
11B	0-MTR-31-497	EF3-A025	3	1PL3900	#6	PASS	
15D	1-MTR-30-1	EF3-A100	3	1PL777	#6	PASS	
16D	1-MTR-30-1E	EF3-A100	2	1PL764	#2	PASS	
* RX VENT BD 1B-B							
5E	1-MTR-30-11	EF3-A003	HI	1PL794	#12	PASS	
6A	0-MTR-31-26	EF3-A010	4	1PL752	#12	PASS	
6E	1-MTR-30-11E	EF3-A003	HI	1PL760	#12	PASS	
9B	1-MTR-30-97	EF3-A025	LO	1PL531	#10	PASS	
				1PL532	#12		
10B	1-MTR-30-100	EF3-A025	LO	1PL561	#10	PASS	
				1PL562	#12		
15D	1-MTR-30-4	EF3-A100	3	1PL785	#2	PASS	
16D	1-MTR-30-4E	EF3-A100	2	1PL768	#2	PASS	
* RX VENT BD 2B-B							
11B	0-MTR-31-498	EF3-A025	3	2PL3901	#6	PASS	
* RMOV BD 1A1-A							
17A	1-HTR-62-228/2	EF3-B040		1PL6208	#8	PASS	
				6209 &10	#12		
* RMOV BD 1B1-B							
17A	1-HTR-62-228/1	EF3-B040		1PL6214	#8	PASS	
				6215 &16	#12		
* RMOV BD 2A1-A							
17	HTR-62-228/4	EF3-B040		2PL6208	#8	PASS	
				6209 &10	#12		

ATTACHMENT NO. M10448A - SECTION A
WBN EEB-MS-TI15-0011
480V CLASS 1E MOTOR CONTROL CENTERS
NON-CLASS 1E CIRCUITS

COMPUTED TMB DATE 6-13-90
CHECKED EJH DATE 6/13/90

CMPT	LOAD	BKR TYPE	BREAKER SETTING	CABLE NO	CABLE SZ	CABLE PROT	NOTES
** RMOV BD 2B1-B							
17A	2-HTR-62-228/3	EF3-B040		2PL6214	#8	PASS	
				6215 &16	#12		
** RMOV BD 1A1-A							
18D	0-MTR-62-226	EF3-A005	4	1PL6265	#12	PASS	
** RMOV BD 1A2-A							
4A	1-FCV-3-191	EF3-A010	4	1V3260	#12	PASS	
4B	1-FCV-3-192	EF3-A010	4	1V3280	#12	PASS	
** RMOV BD 1B2-B							
4A	1-FCV-3-193	EF3-A010	4	1V3290	#12	PASS	
4B	1-FCV-3-194	EF3-A010	4	1V3270	#12	PASS	

PURPOSE

The purpose of this Attachment is to evaluate and support modifications to be implemented under the following DCN's: M-08613-A

This Attachment evaluates the adequacy of unit 1 system group 2 protective devices for 480V power cables associated circuits as identified in Appendix F of WBN EEB-MS-TI15-0011.

This Attachment affects the following calculations:

BASELINE CALCULATION	CALCULATION NO.
480V Non-Class 1E Power Cable Associated Circuits	WBN EEB-MS-TI15-0011

ANALYSIS

Appendix F identified that the protective devices are inadequate for the 480V power cables. The protection scheme consists of: two breakers in series or one breaker and one fuse in series or a single fuse. If this scheme protects the 480V non-Class 1E power cables associated circuits, periodic testing is not required.

To resolve the inadequacies, Appendix F was reviewed to ensure that the breakers protect the cables. If the cables are protected, the breakers are deleted from Appendix F and added to the design output document, 45B710-series for inclusion to the periodic testing program.

WBN EEB-MS-TI15-0011 RO
480 V Non-Class 1E Power Cable Associated Circuits

Prepared Kmajmudar Date 2/2/90
G.S. Bates 2/5/90
Checked TBT FOR RAB Date 2-5-90
R. Sitpkar 2-5-90

ATTACHMENT M0861 3A PAGE 2 APPENDIX F

PREP EEB DATE 6/12/90
CHKD ~~EEB~~ DATE ~~6/18/90~~

480V Power Cables Associated Circuits where protective devices were evaluated to be inadequate per acceptance criteria developed in Attachment 1. The protective devices are coded as "B" for a breaker and "F" for a secondary protection fuse.

480 V Bus	Compt. No.	Inadequate Protective Device	
~~2-BD-212-A1~~	~~2C~~	~~B~~	M0861 3A 2/12/90 JBB 2/12/90 REE 2/12/90
	~~8A~~	~~F~~	
~~2-MCC-214-A2~~	~~2D1~~	~~F~~	M0861 3A
	~~6D1~~	~~F~~	
	~~2E1~~	~~F~~	
	~~6F1~~	~~F~~	
	~~7D1~~	~~F~~	
	~~3D1~~	~~F~~	
	~~3E1~~	~~F~~	
	~~3F1~~	~~F~~	
	~~3F2~~	~~F~~	
	~~4E1~~	~~F~~	
	~~4F1~~	~~F~~	
	~~5F1~~	~~F~~	
	~~5F2~~	~~F~~	
	~~6F2~~	~~F~~	
	~~7E1~~	~~F~~	
2-MCC-214-B1	3F2	F	
	2F1	F	
	9F1	F	
	12F1	F	
	12F2	F	
1-MCC-232-B	2A, ~~9B, 10B,~~ 13B	F	M0861 3A
	3B	F	
	3C	F	
	6C	B	
	6F1	F	
	7B	F	
	8B	F	
	~~11F~~	~~F~~	M0861 3A JBB 2/12/90 REE 2/12/90
	~~12F~~	~~F~~	
	~~13B~~	~~F~~	
	14B	F	
	~~15A~~	~~F~~	
	~~16A~~	~~F~~	M0861 3A

WBN EEB-MS-TI15-0011 RO
480 V Non-Class 1E Power Cable Associated Circuits

Prepared Engineered/Gilbates Date 2/2/90 2/5/90 Checked ~~TBT~~ FOR RHB R. Supikar Date 2-5-90 2-5-90

ATTACHMENT M0861 3A PAGE 7

PREP EH DATE 6/12/90
CHKD ~~GP~~ DATE ~~6/18/90~~

480 V Bus	Compt. No.	Inadequate Protective Device	
1-MCC-232-A	3A, 2A, ~~4B, 10B~~	F	M0861 3A
	3B	F	
	3C	F	
	4D	B	
	7B	F	
	8B	F	
	10F	F	
	~~11F~~	~~F~~	M0861 3A
	13D	F, B	
	14B	F	
	~~14D~~	~~F~~	2/14/90
	~~15A~~	~~F~~	REB 2/15/90
	~~16A~~	~~F~~	M0861 3A
2-MCC-214-A1	2F1	F	
	2F2	F	
	3F1	F	
	4F2	F	
	10F1	F	
	12E1	F	
2-MCC-214-B2	~~2E1~~	~~F~~	M0861 3A
	~~2F1~~	~~F~~	
	~~3E1~~	~~F~~	
	~~3F1~~	~~F~~	
	~~4E1~~	~~F~~	
	~~4F1~~	~~F~~	
	~~4F2~~	~~F~~	
	~~5E1~~	~~F~~	
	~~5F1~~	~~F~~	
	~~6E1~~	~~F~~	
	~~6F1~~	~~F~~	
	~~5F2~~	~~F~~	
	~~7E1~~	~~F~~	
	~~8E2~~	~~F~~	
0-MCC-208-A	~~2C~~	~~F~~	2/12/90 REB 2/12/90
	6A	F	
	6B	F	
	~~7A~~	~~B~~	M0861 3A
	~~7C~~	~~B~~	
	~~8B~~	~~B~~	
	~~8C~~	~~B~~	
	~~8D~~	~~B~~	

WBN EEB-MS-TI15-0011 RO
480 V Non-Class 1E Power Cable Associated Circuits

Prepared ~~Engineer~~ G Bates Date 2/2/90 2/15/90 Checked ~~TBI FOR RHR~~ R. Supkar Date 2-5-90 2-5-90

ATTACHMENT M0861DA ~~PAGE~~ 4 PREP EJJ DATE 6/12/90 CHKD GP DATE 6/18/90

480 V Bus	Compt. No.	Inadequate Protective Device	
2-MCC-232-A	3B, 2A, ~~9B, 10B~~, 10F	F	M0861DA
	3C	F	
	4D	B	
	7B	F	
	8B	F	
	11D	F	
	~~11F~~	~~F~~	
	~~13B~~	~~F~~	JHH 2/15/90
	14B	F	
	~~14B~~	~~F~~	AEO 2/15/90
	~~15A~~	~~F~~	M0861DA
	~~16A~~	~~F~~	
2-MCC-232-B	2A, ~~9B, 10B, 13B~~	F	
	3A	F	
	3B	F	
	3C	F	
	6C	B	
	6F1	F	
	7B	F	
	8B	F	
	10F	F	
	~~11F~~	~~F~~	M0861DA
	~~12F~~	~~F~~	
	14B	F	
	~~15A~~	~~F~~	M0861DA
	~~16A~~	~~F~~	
1-MCC-214-A2	~~2D1~~	~~F~~	M0861DA
	~~2E1~~	~~F~~	
	~~3D1~~	~~F~~	
	~~3E1~~	~~F~~	
	~~3F1~~	~~F~~	
	~~3F2~~	~~F~~	
	~~4E1~~	~~F~~	
	~~4F1~~	~~F~~	
	~~5F1~~	~~F~~	
	~~5F2~~	~~F~~	
	~~6F2~~	~~F~~	
	~~7E1~~	~~F~~	
	~~2E2~~	~~B, F~~	
1-MCC-214-B2	~~2E1~~, ~~8F1~~	~~F~~	
	~~2F1~~	~~F~~	
	~~3E1~~	~~F~~	
	~~3F1~~	~~F~~	
	~~4E1~~	~~F~~	

WBN EEB-MS-TI15-0011 RO
480 V Non-Class 1E Power Cable Associated Circuits

Prepared for ymuckerman Date 2/2/90 Checked TBT FOR RHB Date 2-5-90
RLBates 2/5/90 R. Supkar 2-5-90

ATTACHMENT M086013A PAGE 5

PROD EEB DATE 6/12/90
CHKD ~~GP~~ DATE ~~6/18/90~~

480 V Bus	Compt. No.	Inadequate Protective Device	
1-MCC-214-B2 (Cont.)	~~4F1~~	~~F~~	M086013A
	~~4F2~~	~~F~~	
	~~5E1~~	~~F~~	
	~~5F1~~	~~F~~	
	~~6E1~~	~~F~~	
	~~6F1~~	~~F~~	
0-MCC-208-B	~~6F2~~	~~F~~	
	8B	B	
	8D	B	
0-MCC-216-B	4F	F	
0-MCC-217-A	~~3E~~	~~B~~	M086013A
	~~4E~~	~~B~~	
1-MCC-210-A	3F2	B	
2-MCC-209-A	~~7D~~	~~B~~	M086013A
0-MCC-218-1	6D	B	
0-MCC-208-C	9A	B	
	~~7C1~~	~~F~~	M086013A
1-MCC-214-A1	2F2	F	
	3F1	F	
	3F2	F	
	5F1	F	
	10F1	F	
	12E1	F	
1-MCC-214-B1	2F2	F	
	9F1	F	
	12E1	F	
	12F1	F	
	13F1	F	
1-MCC-213-B1	~~16E~~ 16A	~~F~~	M086013A
	~~17E~~	~~F~~	
	~~17A~~	~~B~~	
1-MCC-213-A1	~~17E~~ ~~16A~~ 16B	F	M086013A
~~1-BD-212-B2~~	~~3B~~	~~F~~	

2/15/90 AEB
2/15/90 AEB

ATTACHMENT M0861 3A PAGE 6
PRPD EJH DATE 6/12/90
CHKD GP DATE 6/10/90
~~Page 195 of 200~~
~~Page F5 of Final~~

WBN EEB-MS-TI15-0011 RO
480 V Non-Class 1E Power Cable Associated Circuits

Prepared kmcgahee/cw Date 2/2/90 Checked TBT FOR RMB Date 2-5-90
GS Bates 2/5/90 RSupkar 2-5-90

480 V Bus	Compt. No.	Inadequate Protective Device	
~~2-BD-212-B2~~	~~3B~~	~~F~~	JHH 2/15/90 REQ 2/15/90
2-MCC-213-A1	JHH 2/15/90 REQ 2/15/90 ~~17E, 16A,~~ 16B	F	
2-MCC-213-B1	~~16E, 16A~~	~~F~~	M0861 3A
	~~17E~~	F	
	~~17A~~	~~B~~	

WBN EEB-MS-TI15-0011 R0 Page H21 of H72

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Bachert Date 1/22/90 Checked [illegible] Date 1/26/90

R.H. Bachert 1/17/90 [illegible] 1/25/90

R Sivakar 2-5-90

O-MCC-208-A

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO.
		EF3-		(A)		G30	MFR	MODEL	RATING		
6F2	O-HST-271-AB12	B040	N/A	Y40		N/A	←	N/A	→	6	PL917
7A	1 HTR-31-397	~~A050~~ A027	HIGH	N ~~470~~ 225	2	T47	←	N/A	→	10	PL921
7C	O-MTR-31-452	H050	4	N565	2	T52	←	N/A	→	6	PL943
7D	O-MTR-31-455	H050	LO	Y320	2	T52	←	N/A	→	6	PL20
7E1	O-CHGR-240-1	B020	N/A	Y20		N/A	←	N/A	→	10	PL875
7E2	O-HST-271-AB13	B030	N/A	Y30		N/A	←	N/A	→	8	PL907
7F1	O-HST-271-AB14	B030	N/A	Y30		N/A	←	N/A	→	8X2	PL906
7F2	O-LAC-233-B0	B050	N/A	Y50		N/A	←	N/A	→	6	PL803
8A	O-MTR-31-APA	A005	HIGH	Y41		N/A	←	N/A	→	12	PL812
8B	2-MTR-31-397	A025	HIGH	210 N	1	T47	←	N/A	→	12 10	PL2080 PL925
[redacted]	2-MTR-31-396	A025	HIGH	N210	1	T47	←	N/A	→	10	PL930
	1-MTR-31-396	A025	HIGH	N210	1	T47	←	N/A	→	10	PL934
8E	O-MTR-31-BPB	A005	4	29 Y		N/A	←	N/A	→	12	PL816
8F1	O-MTR-31-APOC	B020	N/A	20Y		N/A	←	N/A	→	12 10	PL2082 PL822
8F2	O-MTR-31-BPBC	B020	N/A	20Y		N/A	←	N/A	→	10	PL820
9D1	O-LAC-233-90	B040	N/A	40Y		N/A	←	N/A	→	8	PL3105
9D2	O-LAC-233-91	B040	N/A	40Y		N/A	←	N/A	→	4	PL3106
9E1	O-LAC-233-92	B040	N/A	40Y		N/A	←	N/A	→	2	PL3107
9E2	O-LAC-233-93	B040	N/A	40Y		N/A	←	N/A	→	2	PL3108
9F1	O-LAC-233-94	B040	N/A	40Y		N/A	←	N/A	→	4	PL3109
6F1	O-HTR-271-STED	B050	N/A	50Y		N/A	←	N/A	→	6	PL980

The following protective devices are to be added to the output document 45B710-series for periodic breaker testing and to be implemented on DCN M-08614-A:

480V Bus	Board Name	Compt
0-MCC-208-A	Aux Bldg Com MCC A	7C 8D
0-MCC-208-B	Aux Bldg Com MCC B	6F2
0-MCC-208-C	Aux Bldg Com MCC C	7C1
0-MCC-217-A	CVC Board A	3E 4E

The following are circuit breaker changes required to protect the 480V non-Class 1E power cable associated circuits:

480V Bus	Board Name	Compt	Bkr Type
0-MCC-208-A	Aux Bldg Com MCC A	7A	EF3-A025

CONCLUSION

This Attachment No. M08613A confirms that the protection scheme for 480V non-Class 1E power cables for associated circuits is adequate and the protective devices are periodically tested to ensure unacceptable influences to the Class 1E circuits.

PURPOSE

The purpose of this Attachment is to evaluate and support the modifications to be implemented under DCN's F-13654-A.

The modifications involve breaker replacment and/or breaker setting changes.

The following baseline calculations evaluate the DCN modifications for their impact. These evaluations are identified by the Attachment No. F13654A or the DCN is otherwise identifed in the calculation.

BASELINE CALCULATION	CALCULATION NO.
480VAC 1E COORDINATION/PROTECTION	WBN EEB-MS-TI08-0008
480V NON-CLASS 1E POWER CABLE ASSOCIATED CIRCUITS	WBN EEB-MS-TI15-0011

1.0 SCOPE

This attachment evaluates new circuit breakers and settings for the following loads to ensure that the cables are adequately protected within the guidelines of the base calculation.

EQUIPMENT ID	BOARD (COMPT)	WIRE SIZE	PROT DEVICE	SETTING (RTG)
1-MTR-30-CRD	1-MCC-214-A2-A (8A)	2/0	FXD63B125	LO (800A)
0-HTR-31-421	1-MCC-214-B2-B (7D)	300	FXD63B225	3 (1500A)
1-MTR-30-CRB	1-MCC-214-A2-A (9A)	4/0	FXD63B125	LO (800A)
1-MTR-31-303/2	1-MCC-213-A1-A (16F2)	10	ED63B020	NA (20A)
1-MTR-31-324/2	1-MCC-213-B1-B (17F2)	10	ED63B020	NA (20A)

2.0 ASSUMPTIONS

See Section 2.0 of the base calculation.

3.0 REFERENCES

3.1 Calculation, 480VAC 1E Coordination/Protection, WBN EEB-MS-TI08-0008

4.0 DESIGN INPUT

The new circuit breakers/settings were taken from Ref. 3.1.

5.0 JUSTIFICATION OF ASSUMPTIONS

See Section 5.0 of the base calculation.

6.0 METHODOLOGY

Sheets from the base calculation pertaining to the proposed modifications were marked to show the new protective devices.

Time current plots are included to verify that the cables are adequately protected.

(See Section 10.0)

7.0 GRAPHICS

Graphics for this attachment consist of the time-current plots for the new protective devices (See Section 10.0).

8.0 SUMMARY OF RESULTS

The results of this attachment are depicted on the associated time-current plots and the marked sheets from Appendix A (See Section 10.0).

9.0 CONCLUSIONS

The new protective devices and settings adequately protect the cables.

10.0 ATTACHMENTS

Sheets from the base calculation showing proposed modifications:

Time-current plots for protective devices:

WBN EEB-MS-T115-0011RO
480 V Power Cable Associated Circuits
Page A1 of A5

Prepared HH Date 2/2/90 Checked JMZ Date 2/2/90

90°C RATED CABLE PROTECTION (0-10 SEC REGION ONLY)

CABLE SIZE	MAXIMUM PROTECTIVE DEVICE RATING	REFERENCE	
#14 AWG	- SQ.D - QOB-25A - BUSSMAN - FRS 15A - MAG ONLY BKR SETG. PLUS TOLERANCE LOWER THAN 80A - BUSSMAN - KNIN 25A - SHMT - A4J - 30A	TC-109 TC-118	Appendix C
#12 AWG	- SHMT - TRS-20A	TC-64	Appendix C
	- SQD - QOB140 - ITE - EF3 B030 - MAG. ONLY BKR SETG. PLUS TOLERANCE LOWER THAN 140A	TC-112 TC-77	App. C
#10 AWG	- SHMT - TRS 30A - ITE - EF3B040 - SQ.D - QOB150 - MAG. ONLY BKR, SETG. PLUS TOLERANCE LOWER THAN 225A - HFCP - 15A	TC-38 TC-39 TC-117	App. C
	ED63B050	CURVE ED63B050	

WBN EEB-MS-T115-0011RO
480 V Power Cable Associated Circuits

Prepared HH TBT 2-5-90 Date 2/2/90 Checked GML TMB 2-5-90 Date 2/2/90

* 90°C RATE CABLE PROTECTION (0-10 SEC. REGION ONLY) *

CABLE SIZE	MAXIMUM PROTECTIVE DEVICE RATING	REFERENCE
#2	– W JA 125A	TC-83 } APP. C
	– W DS BKR 150A SENSOR LTDELAY @ 12 SEC. ST OR INSTANT PICK UP < 600% (THE USE OF OTHER SETTINGS SHOULD BE INVESTIGATED)	TC-6 } APP. C D-16 (APP. D)
	– SHMT – CP6-4/0	
	– SHMT – CP6A-2/0	
	– MAG ONLY BKR SETTING PLUS TOLER. LOWER THAN 1200A	TC-6 (APP. C)
	– SHMT-HFCP-100A	
	– BUSSMANN JJS 225	
#1/0	– FP FUSEMATIC 100A	TC-4 (APP. C)
	– ITE-FJ-B125	TC-80 (APP. C)
	(THE USE OF HIGHER RATED BKR SHOULD BE INVESTIGATED)	
	– SHMT-CP6A-4/0	
	– SHMT-CP6-350MCM	
	– MAG ONLY BKR SETG. PLUS TOLERANCE LOWER THAN 2000A	
	– BUSSMANN JJS 400	
	FXD63B225 @ 3	CURVE FXD63B225

WBN EEB-MS-T115-0011 RO
480 V Power Cable Associated Circuits
Page A4 of A5

Prepared HH Date 2/2/90 Checked JMZ Date 2/2/90

90°C RATED CABLE PROTECTION (0-10 SEC. REGION ONLY)

CABLE SIZE	MAXIMUM PROTECTIVE DEVICE RATING	REFERENCE
# 2/0 AWG	W DS BKR SENSOR 150A LT DELAY @ 36 SEC. INST or SHRT TIME PU upto 12 TIMES SENSOR RATING (THE USE OF OTHER SETTINGS SHOULD BE INVESTIGATED	TC-91 & D16 (APP. C) (APP. D)
	FXD63B125 @ HI	CURVE FXD63B125
#4/0 AWG	- ITE- FJ3B225	TC-27 & D21 (APP. C & D)
	- W DS BKR SENSOR 300A LT DELAY @ 36 SEC INST or SHORTTIME PU UPTO 12 TIMES SENSOR RATING (THE USE OF OTHER SETTINGS SHOULD BE INVESTIGATED	TC-7 & D16 (APP. C & D)
	- SHMT- CP6A- 350MCM	
	- SHMT- CP6- 750 MCM	
	- SHMT- CP- 750 MCM	

WBN EEB-MS-TI15-0011 R0 Page H36 of H72

Calculation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R. H. Buchart Date 1/22/90 Checked [signature] Date 1/26/90
[signature] 1/16/90 R. H. Buchart 1/25/90
[signature] 2/5/90 R. Slupkar 2/5/90

1-MCC-213-A1

COMPT NO	SERVICE	BKR TYPE (*EF3-)	SET POS	TRIP RATING (A)	STR SIZE	OL HTR CAT# G30	SECONDARY PROTECTION MFR	MODEL	RATING	CABLE SIZE	CABLE NO
16A	1-PENT-293-32	A010	3	Y 45 Y	1	T32	SHAW-MUT	TRS-30	Y 30A N	10 12	1PL6300 1PL6301
16B	1-PENT-293-24	A010	LO	Y 27 Y	1	T27	SHAW-MUT	TRS-30	Y 30A N	10 12	1PL6268 1PL6269
16F1	O-XSW-252-1	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	1PL6040
16F2	1-TB-31-303/2	(ED63) B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10X2	1PL6289
17A	O-JB-292-2051	B030	N/A	Y 30	2	N/A	N/A	N/A	N/A	8 12 12	1PL6208 1PL6209 1PL6210
17E	1-PENT-293-32	B100	N/A	Y 100	N/A	N/A	SHAW-MUT	CPGA-197 #2	~~N~~ Y GHY 2/15/90 RGO 2/15/90	2 2	1PL6100 1PL6094
17F1	O-XSW-240-5	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	1PL6060
18C	1-MTR-31-303	A010	3	Y 45	1	T32	←	N/A	→	12	1PL6281
18D	O-MTR-62-226	A005	3	Y 22	1	T26	←	N/A	→	12	1PL6265
18F1	O-XSW-250-1	B020	N/A	Y 20 <				N/A	→	10	PL871
18F2	1-JB-293-2859	A100	LO	Y 475	←			N/A	→	2X2 2 2 2 2 2	1PL6093 1PL6101 1PL6102 1PL6103 1PL6104 1PL6106

*EXCEPT AS NOTED

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CN EEB-MS-TI15-0011 R0
Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchart Date 1/22/90
R.H. Buchart 1/10/90
Checked Engineer Date 1/26/90
Supervisor 1/25/90

1-MCC-213-B1

COMPT NO	SERVICE	BKR TYPE (#EF3-)	SET POS	TRIP RATING (A)	STR SIZE	OL HTR CAT# G30	SECONDARY PROTECTION MFR	MODEL	RATING	CABLE SIZE	CABLE NO
3F1	0-XSW-252-2	B020	N/A	Y 20	←		N/A		→	10	1PL6045
16A	1-PENT-293-35	A010	3	Y 45	1	T32	1	TRS30	Y 30A N	10 12	1PL6310 1PL6311
16E	1-PENT-293-47	B100	N/A	Y 100	N/A	N/A	1	CPGA-197 #2	N Y	2 2	1PL6085 1PL6082
16F1	0-XSW-240-5	B020	N/A	Y 20	←	N/A			→	10	1PL6061
17A	0-JB-292-2048	B040	N/A	Y 40 N N	2	←	N/A		→	8 12 12	1PL6214 1PL6215 1PL6216
17E	1-PENT-293-35	B100	N/A	Y 100	N/A	N/A	1	CPGA-197 #2	N Y	2x2 2	1PL6075 1PL6076
17F1	0-XSW-240-1	B020	N/A	Y 20	←		N/A		→	10	PL876
17F2	1-TB-31-324/2	ED63 B020	N/A	Y 20	←		N/A		→	10	1PL6291
18C	1-MTR-31-324/1	A010	3	Y 45	1	T32	←	N/A	→	10	1PL6285
18D	0-MTR-84-2	A005	3	Y 22	1	T26	←	N/A	→	12	1PL6273

* EXCEPT AS NOTED

Form GO-3.08.1 Rev. 2 SL-F647 04/84

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UBN EEB-MS-TI15-0011 RO
Isolation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Kingsnider Date 1/22/90 Checked R.H. Burchett Date 1/26/90
Kingsnider 1/16/90 R.H. Burchett 1/25/90

1-MCC-214-A2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		*EF3-		(A)		G30	MFR	MODEL	RATING		
4F1	1-HTR-30-CCRD	B020	N/A	Y20	N/A	N/A	1	DISA030	N30A	10	IPL3268
5A	1-MTR-30-301	A010	3	Y45	1	T34	←	N/A	→	12	IPL3435
5E1	0-HTR-31-83	B030	N/A	Y30	N/A	N/A.	1	DISA030	Y30A	8	IPL3707
5F1	1-HTR-30-XM1A	B020	N/A	Y20	N/A	N/A.	1	DISA030	N30A	10	IPL3370
5F2	1-HTR-30-AB1	B020	N/A	Y20	N/A	N/A	1	DISA030	N30A	10	IPL3314
6E1	1-HTR-30-SMS	B030	N/A	Y30	N/A	N/A.	1	DISA030	Y30A	8	IPL2811
6E2	1-HTR-30-NM1	B050	N/A	Y50	N/A	N/A.	1	DISA050	Y50A	6	IPL2806
6F2	0-HTR-30-RM1	B020	N/A	Y20	N/A	N/A	1	DISA030	N30A	10	IPL3320
7D2	0-HTR-30-AFH	B040	N/A	Y40	N/A	N/A	1	DISA050	Y50A	6	IPL3335
7E1	1-HTR-30-U1A	B020	N/A	Y20	N/A	N/A.	1	DISA030	N30A	10	IPL2813
7E2	0-HTR-30-BFH	B040	N/A	Y40	N/A	N/A	1	DISA050	Y50A	6	IPL3330
7F2	0-HTR-30-CFH	B040	N/A	Y40	N/A	N/A.	1	DISA050	Y50A	6	IPL3340
8A	1-MTR-30-CRD	FXD63 ~~F33~~ B125	LO ~~H~~	Y800 ~~1600~~	N/A	N/A	←	N/A	→	2/0	IPL3692
8B	1-HTR-1-CBS	FJ3 B125	4	Y1500	N/A	N/A	←	N/A	→	4/0	IPL3680

* EXCEPT AS NOTED

Form GO-3.08.1 Rev. 2 SL-F647 04/84

WBN EEB-MS-TI15-0011 R0 Page H45 of H72

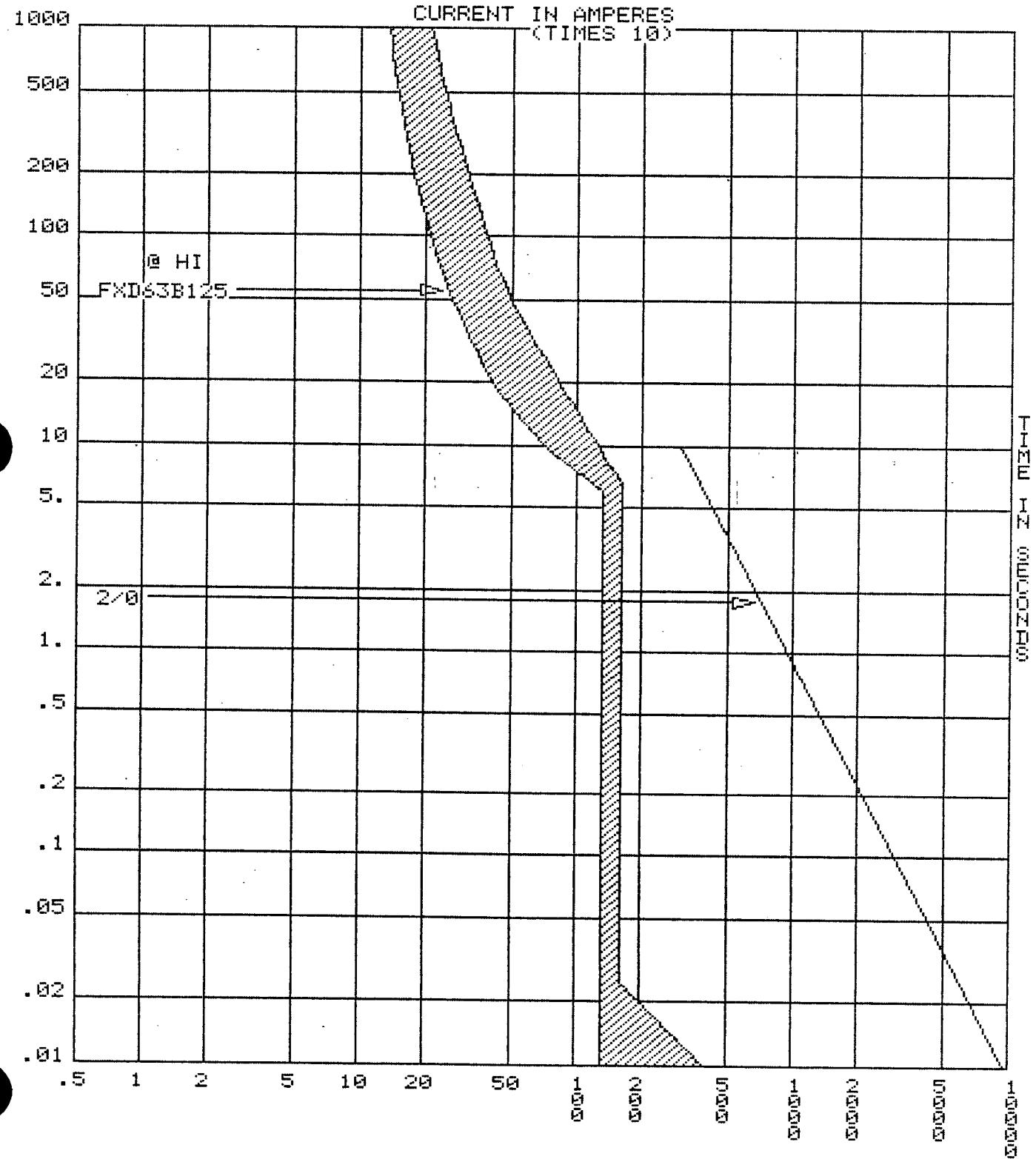
Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Anajmudar. Date 1/22/90 Checked R.H. Bucheit Date 1/26/90
R.H. Bucheit 1/17/90 Brad Kelley 1/25/90
YL Bates 2/5/90 RSupkar 2-5-90

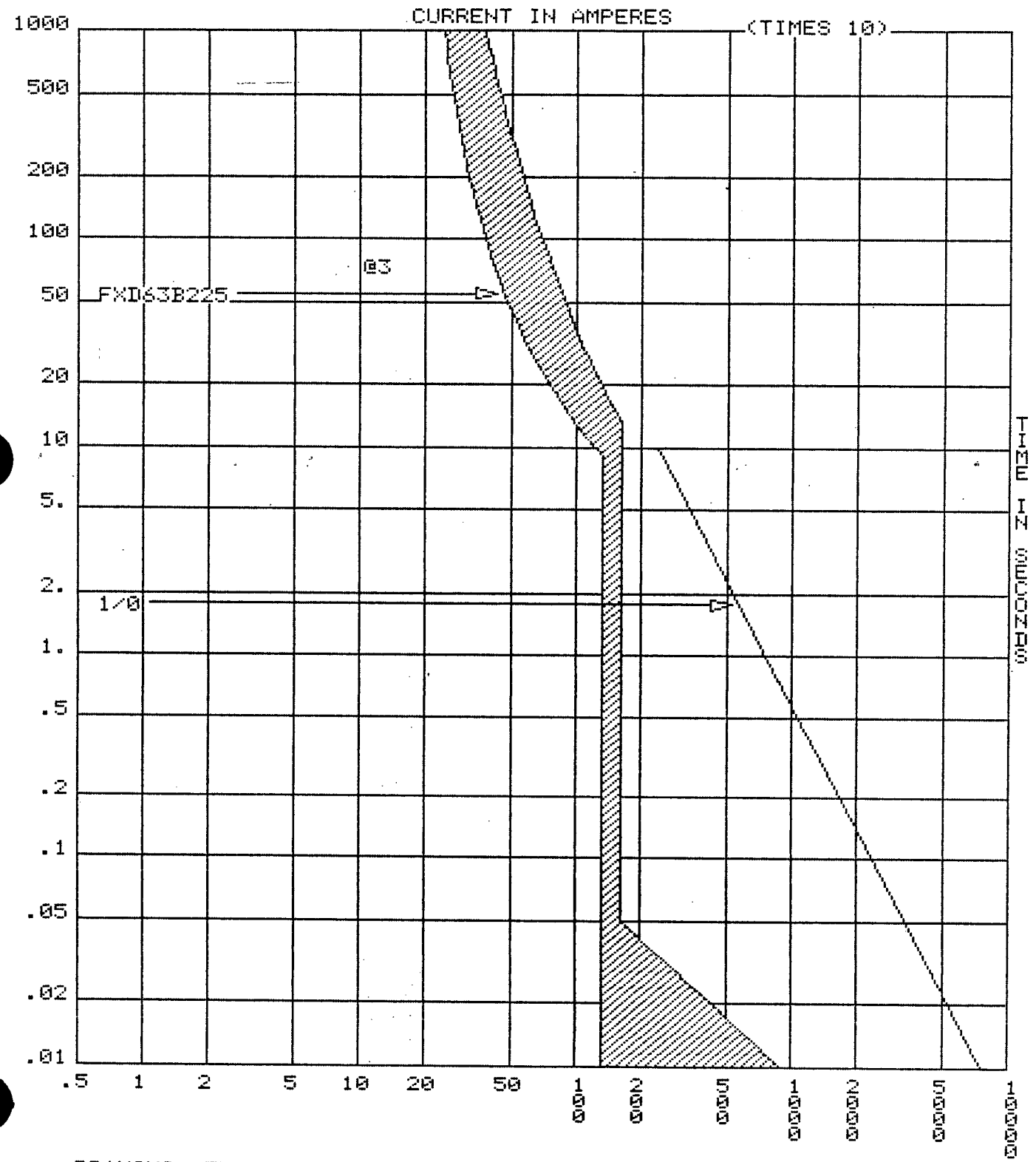
1-MCC-214-B2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		*EF3-		(A)		G30	MFR	MODEL	RATING		
5F1	0-HTR-30-RM2	B020	N/A	Y 20	N/A	N/A	1	D15A030	N 30A	10	IPL3385
6B	1-MTR-30-26	A010	3	Y 45	1	T32	←	N/A	→	12	IPL2913
6E1	1-HTR-30-AB7	B020	N/A	Y 20	N/A	N/A	1	D15A030	N 30A	10	IPL3381
6F1	1-HTR-30-T1B	B020	N/A	Y 20	N/A	N/A	1	D15A030	N 30A	10	IPL3430
7D	0-HTR-31-421	FXD63 ~~FD3~~ B225	3 ~~HE~~	Y 1500 ~~2000~~	N/A	N/A	←	N/A	→	300	IPL3440
7E2	0-HTR-31-72	EF3- B030	N/A	Y 30	N/A	N/A	1	D15A030	Y 30A	8	IPL2977
7F1	1-HTR-30-NM2	B050Z	N/A	Y 50	N/A	N/A	1	D15A050	Y 50A	6	IPL3421
8F1	0-TB-31-494	B040	N/A	Y 40	N/A	N/A	1	D15A050	Y 50A	6	IPL6470
									N	10	IPL6473
										10	IPL6474
8F2	1-P0-214-10	B100	N/A	Y 100	N/A	N/A	1	D15AB100	Y 100A	2	IPL2785
9A	1-MTR-30-CRB	FXD63 ~~FD3~~ B125	LO	Y 800 ~~750~~	N/A	N/A	←	N/A	→	4/0	IPL3671

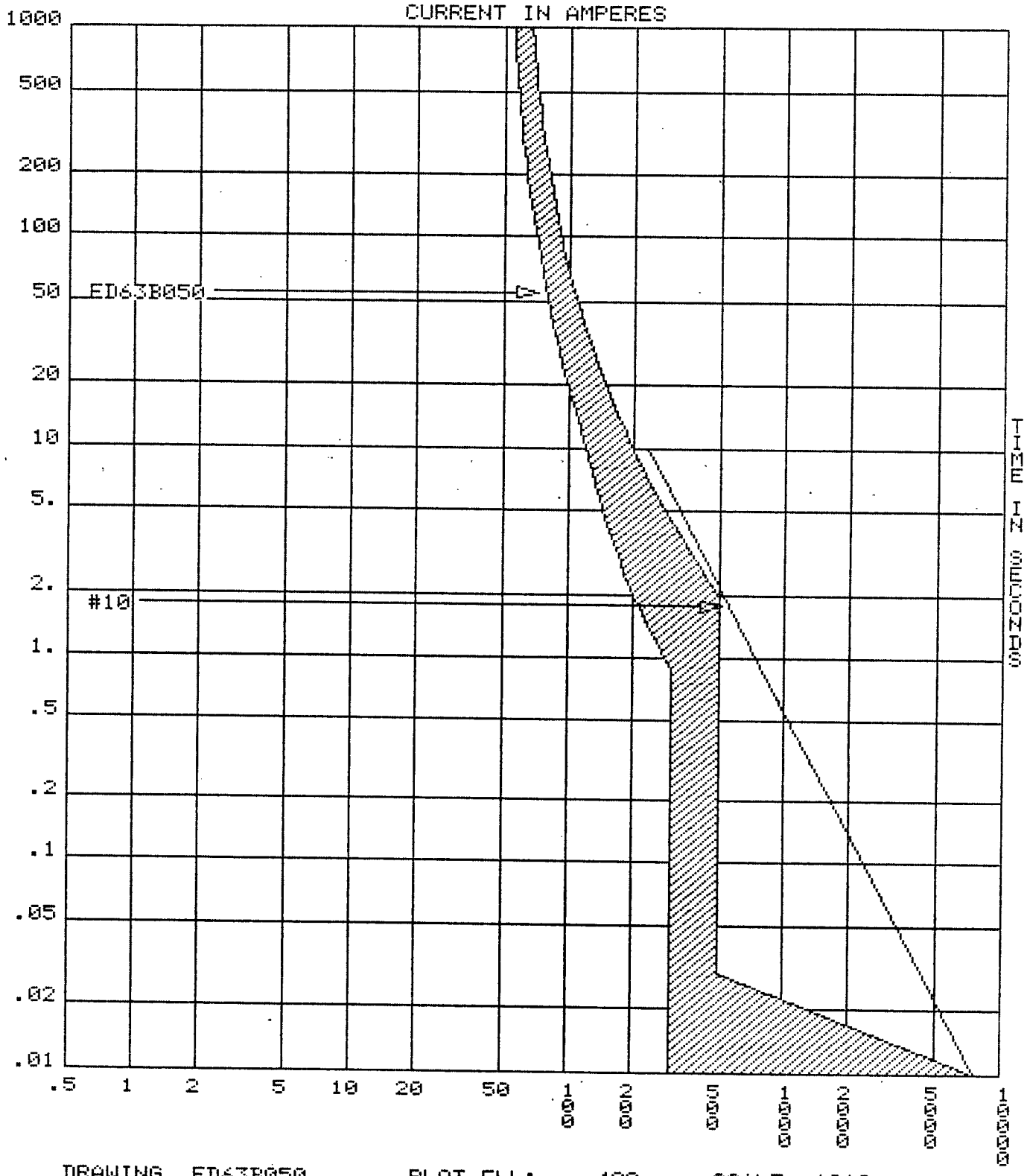
*EXCEPT AS NOTED



DRAWING FXD63B125 PLOT ELL: 480 SCALE: 10^1



DRAWING FXD63B225 PLOT ELL: 480 SCALE: 10^1


CURRENT IN AMPERES
1000
500
200
100
50
20
10
5.
2.
1.
.5
.2
.1
.05
.02
.01
ED63B050
#10
.5
1
2
5
10
20
50
100
200
500
1000
2000
5000
10000
TIME IN SECONDS
DRAWING ED63B050
PLOT ELL: 480
SCALE: 10^0

PURPOSE

The purpose of this Attachment is to evaluate and support modifications to be implemented under DCN's C-03205-A and M-09494-A.

Modifications involve splicing of cables with a different cable mark number/size (DCN C-03205-A) and redesignating 480V Control & Auxiliary Building Vent Board 1B2-B compartment 7D to 7C (DCN M-09494-A).

Since different aspects of a design modification are evaluated or determined in various calculations other calculations may have also been issued to evaluate/support a particular feature. For identification of all calculations and revisions issued to support the modification(s), see the applicable DCN package.

1.0 SCOPE

This attachment documents data for cables 1PL486 and 1PL497 which are being spliced with a different mark number and conductor size per DCN C-03205-A and documents the compartment number change (7D to 7C) on 480V Control and Auxiliary Building Vent Board 1B2-B.

2.0 ASSUMPTIONS

See "Assumptions" in the base calculation (Section 2.0).

3.0 SOURCES OF DESIGN INPUT / REFERENCES

3.1 DCN C-03205-A Cable design review sheets

3.1 DCN M-09494-A Cover sheet

4.0 DESIGN INPUT DATA

Input data consists of the cable data taken from Ref. 3.1 (See Section 10.0) which shows the conductor sizes as a #4 (WFA-16) spliced to #8 (WDD-2) for the subject cables and Ref. 3.2.

5.0 JUSTIFICATION OF ASSUMPTIONS

See "Justification of Assumptions" in base calculation (Section 5.0).

6.0 METHODOLOGY

6.1 DCN C-03205-A

The methodology for this attachment is similar to that used in the Revision 0 of the base calculation. The cable sizes were shown on the applicabe sheets of Appendix H along with their protective devices. The cable sizes and protective devices were compared to the acceptance criteria of Appendix A which notes the maximum protective device(s) for a given conductor size. Acceptable/unacceptable cable protection was noted in Appendix H by either a "Y" or "N" (See Section 10.0)

6.2 DCN M-09494-A

The methodology involved documenting the revised compartment number.

7.0 GRAPHICS

Graphics consists of the applicable time-current plots in the base calculation (Appendix C).

8.0 SUMMARY OF RESULTS

Cable 1PL486 is adequately protected by both the fuse (TRS-60) and the circuit breaker (EF3-B030).

Cable 1PL497 is adequately protected by the fuse (TRS-60) but not by the circuit breaker (EF3-B100).

9.0 CONCLUSIONS

Cable protection is adequate since the cables are not required to be protected by both of the protective devices in the circuits.

10.0 ATTACHMENTS/ADDITIONAL DATA

WATTS BAR NUCLEAR PLANT CABLE ROUTING SYSTEM

WBNEEB-MS-TI15-0011
ATTACHMENT C03205A
/M094A

CABLE DESIGN REVIEW SHEET

CABLE ID	SEP	SET	REV	NV	SYS	FNODE	TNODE	APX-R	50.49
L 486		1*2	R08	4	77	0	0	N	N

CABLETYP	NC1	NC2	MCM/AWG	DIA	CSA	WT/FT
WFA-16	1	3C	4	0.942	0.697	0.835

TEMP	PULL RAD	TRAIN RAD	CONTRACT	BIND/TEMP
	0.000		745568	

FROM ID: 1-PENT-293-24 LOC/ELEV: RZ238 / 730RM:
TO ID: 1-MTR-77-4 LOC/ELEV: RZ270 / 703RM:

FROM DWG: 10002-02-1-24 TO DWG: 45W1755-1

FOR: RC OR TK PMP A SUPPLY ECN: DCN: C03205

AUTO-SIZING DATA

AC/DC: AC AMP: 9. MAX-VD: MIN NC1: LOAD: M VDROP:

ROUTING INFORMATION

GN LENGTH	N/R LNGTH	TRAY LENGTH	COND LENGTH	INST LENGTH
72	7		65	

CONDUITS: 1PLC1032

TRAY NODES:

RECORD STATUS INFORMATION

VERIF STATUS : V VERIFIED BY : DAH VERIF DATE : 901119
ROUTING STATUS: H ROUTING PRIRTY: 2 UPDATE DATE: 901119

REVIEW SIGNATURES

DESIGNER: _____ DATE: 11-20-90 CHECKER : _____ DATE: _____

WATTS BAR NUCLEAR PLANT CABLE ROUTING SYSTEM

WBN EEB-MS-TI5-0011
ATTACHMENT C03205A
M094944

CABLE DESIGN REVIEW SHEET

CABLE ID	SEP	SET	REV	NV	SYS	FNODE	TNODE	APX-R	50.49
L 486		2*2	R08	4	77	0	0	N	N

CABLETYP	NC1	NC2	MCM/AWG	DIA	CSA	WT/FT
WDD-2	3	1C	8	0.291	0.067	0.093

TEMP	PULL RAD	TRAIN RAD	CONTRACT	BIND/TEMP
	0.000		745568	

FROM ID: 1-PENT-293-24 LOC/ELEV: RZ238 / 730RM:
TO ID: 1-MTR-77-4 LOC/ELEV: RZ270 / 703RM:

FROM DWG: 10002-02-1-24 TO DWG: 45W1755-1

FOR: SPLICE AT JB 6400 ECN: DCN: C03205

AUTO-SIZING DATA

AC/DC: AC AMP: 9. MAX-VD: MIN NC1: LOAD: M VDROP:

ROUTING INFORMATION

GN LENGTH	N/R LNGTH	TRAY LENGTH	COND LENGTH	INST LENGTH
11	7		4	

CONDUITS: 1PLC3953

TRAY NODES:

RECORD STATUS INFORMATION

VERIF STATUS : V VERIFIED BY : DAH VERIF DATE : 901119
ROUTING STATUS: H ROUTING PRIRTY: 2 UPDATE DATE: 901119

REVIEW SIGNATURES

DESIGNER: Greg Nixon DATE: 11-20-90 CHECKER :_____ DATE:_____

WATTS BAR NUCLEAR PLANT CABLE ROUTING SYSTEM

WBN EEB-MS-TI15-0011
ATTACHMENT C03205A
PAGE 6 1M094494A

CABLE DESIGN REVIEW SHEET

CABLE ID	SEP	SET	REV	NV	SYS	FNODE	TNODE	APX-D	50.49
L 497		1*2	R05	4	77	0	0	N	N

CABLETYP	NC1	NC2	MCM/AWG	DIA	CSA	WT/FT
WFA-16	1	3C	4	0.942	0.697	0.835

TEMP	PULL RAD	TRAIN RAD	CONTRACT	BIND/TEMP
	0.000		745568	

FROM ID: 1-PENT-293-11 LOC/ELEV: RZ248 / 716RM:
TO ID: 1-MTR-77-6 LOC/ELEV: RZ277 / 703RM:

FROM DWG: 10001-01-1-11 TO DWG: 45W1756-1

FOR: RC OR TK PMP B SUPPLY ECN: DCN: C03205

AUTO-SIZING DATA

AC/DC: AC AMP: 18. MAX-VD: MIN NC1: LOAD: M VDROP:

ROUTING INFORMATION

DSGN LENGTH	N/R LNGTH	TRAY LENGTH	COND LENGTH	INST LENGTH
122	7		115	

CONDUITS: 1PLC1036

TRAY NODES:

RECORD STATUS INFORMATION

VERIF STATUS : V VERIFIED BY : DAH VERIF DATE : 901119
ROUTING STATUS: H ROUTING PRIRTY: 2 UPDATE DATE: 901119

REVIEW SIGNATURES

DESIGNER: Qing Xiaoguo DATE: 11-20-90 CHECKER :_____ DATE:_____

WATTS BAR NUCLEAR PLANT CABLE ROUTING SYSTEM

WBN EEB-MS-TI15-0011
ATTACHMENT C03205A
PAGE 7 /M0444A

CABLE DESIGN REVIEW SHEET

CABLE ID	SEP	SET	REV	NV	SYS	FNODE	TNODE	APX-R	50.49
APL 497		2*2	R05	4	77	0	0	N	N

CABLETYP	NC1	NC2	MCM/AWG	DIA	CSA	WT/FT
WDD-2	3	1C	8	0.291	0.067	0.093

TEMP	PULL RAD	TRAIN RAD	CONTRACT	BIND/TEMP
	0.000		745568	

FROM ID: 1-PENT-293-11 LOC/ELEV: RZ248 / 716RM:
TO ID: 1-MTR-77-6 LOC/ELEV: RZ277 / 703RM:

FROM DWG: 10001-01-1-11 TO DWG: 45W1756-1

FOR: SPLICE AT JB 6400 ECN: OCN: C03205

AUTO-SIZING DATA

AC/DC: AC AMP: 18. MAX-VD: MIN NC1: LOAD: M VDROP:

ROUTING INFORMATION

DGN LENGTH	N/R LNGTH	TRAY LENGTH	COND LENGTH	INST LENGTH
11	7		4	

CONDUITS: 1PLC3954

TRAY NODES:

RECORD STATUS INFORMATION

VERIF STATUS : V VERIFIED BY : DAH VERIF DATE : 901119
ROUTING STATUS: H ROUTING PRIRTY: 2 UPDATE DATE: 901119

REVIEW SIGNATURES

DESIGNER: Original Signed DATE: 11-20-90 CHECKER :_____ DATE:_____

Calculation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Bucket Date 1/22/90 Checked Engineer Date 1/26/90
Engineer 1/16/90 R.H. Bucket 1/25/90
Z.L. Bates 2/5/90 R. Supkar 2/5/90

1-MCC-232-A

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
9B	1-PENT-293-32 FAN A	A025	LO	Y 75 Y	1	T40	SHAW-MUT	TRS-30	Y 30 N	10x2 12	1PL520 1PL521
9F2	1-JB-292-1869	B100	N/A	Y 100	N/A	N/A	SHAW-MUT	DISABI00	Y 100	2	1PL250, 251→253
10B	1-PENT-293-24 FAN C	A025	2	Y 105 Y	1	T40	"	TRS-30	Y 30 N	10X2 12	1PL550 1PL551
10F	1-PENT-293-32 STUD	B020	N/A	Y 20 Y	N/A	N/A	"	DL5A030	N 30 N	10 12	1PL270 1PL271
11D	1-PENT-293-24 RCDT A	B030	N/A	Y 30 Y	2	T45	"	TRS-60	Y 60 Y	8 8,4	1PL485 1PL486 R9
11F	1-PENT-293-32 HTR A	B020	N/A	Y 20	N/A	N/A	"	DL5A030	N 30	10 10	1PL336 1PL337
12F	1-PENT-293-32 HTR A	B020	N/A	Y 20	N/A	N/A	"	"	Y 30	10 10	1PL5440 1PL5441
13A	1-PENT-293-5	B040	N/A	Y 40	N/A	N/A	"	DISA050	Y 50	6 6	1PL621 1PL622
13D	1-PENT-293-5	FJ3-B175	HI	Y 1600 N	N/A	N/A	SHAW-MUT	CP6A-14 4/0	Y Y	4/0x2 2/0	1PL820 1PL821
14B	1-PENT-293-5	EF3-A010	2	Y 36	1	T29	"	TRS-30	N 30	12 12	1PL587 1PL588
14D	1-PENT-293-5	FJ3-B150	HI	Y 1600 Y	N/A	N/A	SHAW-MUT	CP6A-14 4/0	Y Y	4/0 2/0	1PL861 1PL862
15A	1-PENT-293-32 (1-HTR-30-35H)	EF3-B070	N/A	Y 70	N/A	N/A	"	DISAB100	N 100	4 4	1PL425 1PL426
15D	1-MTR-30-1	B100	N/A	Y 100	3	T56	N/A	N/A	N/A	2x2	1PL777
16A	1-PENT-293-5	B070	N/A	Y 70	N/A	N/A	SHAW-MUT	DISAB100	N 100	4 4	1PL440 1PL441
16D	1-MTR-30-1E	A100	3	Y 760	3	T56	N/A	N/A	N/A	2	1PL764

WBN EEB-MS-TI15-0011 R0

Calculation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R. H. Bucheit Date 1/22/90 Checked [illegible] Date 1/26/90

[illegible] 1/16/90
H. L. Bates 2/5/90

R. H. Bucheit 1/25/90
R. Suplkar 2-5-90

1-MCC-232-B

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING (A)	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION MFR	SECONDARY PROTECTION MODEL	SECONDARY PROTECTION RATING	CABLE SIZE	CABLE NO	
		EF3-				G30						
10B	1-PENT-293-47	A025	2	Y 105 Y	1	T40	SHAW-MNT	TRS-30	Y 30	10	1PL561	
									N	12	1PL562	
10F	1-PENT-293-11	B020	N/A	Y 20	N/A	N/A	"	"	Y 30	10	1PL707	
										10	1PL708	
11D	1-PENT-293-11	B100	N/A	Y 100 N	2	T49	"	TRS-60	Y 60	4	1PL496	R9
									Y	4, *8	1PL497	R9
11F	1-PENT-293-35	B020	N/A	Y 20	N/A	N/A	"	DISA030	N 30	10	1PL345	
										10	1PL346	
12F	1-PENT-293-35	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10	1PL545D	
										10	1PL5451	
13B	1-PENT-293-11	A010	2	Y 36 Y	1	T29	"	TRS-30	Y 30	10	1PL598	
									N	12	1PL599	
13D	1-PENT-293-11	FJ3-B175	HI	Y 1600 Y	N/A	N/A	"	CPGA-14 4/0	N Y 2/12/90	4/0	1PL897	
									~~Y~~ Y 2/12/90	2/0	1PL975	
										2/0	1PL902 *	
13F	1-PENT-293-11	EF3-B050	N/A	Y 50	N/A	N/A	"	DISA050	Y 50	6	1PL712	
										6	1PL713	
14B	1-PENT-293-11	A003	LO	Y 7	1	T12	"	TRS-30	N 30	12	1PL1100	
										12	1PL1101	
14D	1-PENT-293-11 (AHU)	FJ3-B150	HI	Y 1600 Y	N/A	N/A	"	CP4/0-CS	Y	4/0	1PL937	
										2/0	1PL938	
										2/0	1PL943 **	
14F	1-PENT-293-11	EF3-B040	N/A	Y 40	N/A	N/A	"	DISA050	Y 50	6	1PL704	
										6	1PL705	
15A	1-PENT-293-35	B070	N/A	Y 70	N/A	N/A	"	DISAB100	N 100	4	1PL454	
										4	1PL455	
15D	1-MTR-30-4	A100	3	Y 760	3	T57	N/A	N/A	N/A	2	1PL785	
16A	1-PENT-293-47	B070	N/A	Y 70	N/A	N/A	SHAW-MNT	DISAB100	N 100	4	1PL468	
										4	1PL469	
16D	1-MTR-30-4E	A100	3	Y 760	3	T57	N/A	N/A	N/A	2	1PL768	

* 1PL 902 → 1PL 907 (2/0) → 1PL 912 (2/0) → 1PL 917 (2/0) → 1PL 922 (2/0) → 1PL 927 (2/0) → 1PL 932 (2/0)

** 1PL 943 → 1PL 948 (2/0) → 1PL 953 (2/0) → 1PL 958 (2/0) → 1PL 963 (2/0) → 1PL 968 (2/0)

ISSUE RIMS _____ CLOSURE RIMS _____

DESIGN CHANGE NOTICE
DIVISION OF NUCLEAR ENGINEERING

11-19-90

DCN NO. M8-09494A
PAGE 1 OF 11
REASON CODE 2 NA 4/17 11-21-90

PLANT/PROJECT AND UNIT 3 WATTS BAR NUCLEAR PLANT UNIT-0

C.O NO 5 NA
AREA/BLDG LOC 6 AUX BLDG, A3R, EL 757
EQUIP I.D NO (S)/SYS CODE(S) 7 1-MCC-214-B2-B / 214, 31

REFERENCE DOCUMENTS 8 45W756-8 RL, 45W1773-2RG, 45B1773-7D RC, 45B1773-0 RB, 45NP756-4-3R4
SUPPLIER (OR SUBSUPPLIER) NAME 9 NA

DESCRIPTION SUMMARY 10 DRAWING DISCREPANCY WITH BKR LOCATION
REMARKS 11 NA

DESCRIPTION OF PROBLEM/REQUESTED CHANGE

NUCLEAR ENGINEERING (NE) DRAWINGS SHOW 1-MCC-214-B2-B COMPT 7C AS A FUTURE AND 1-MCC-214-B2-B, COMPT 7D CONTAINING 225A CIRCUIT BREAKER. THE AS FOUND CONDITION SHOWS NO FUTURE COMPT AND THE 225A CIRCUIT BREAKER ENCOMPASSING BOTH COMPT 7C & 7D AS ONE COMPT AND SHALL BE MARKED COMPT 7C. NEED TO CHANGE NE DRAWINGS, CABLE SCHEDULE AND CALCULATIONS TO SHOW CORRECT COMPT NO.

12 JUSTIFICATION/REASON FOR CHANGE
TO CORRECT BREAKER COMPARTMENT LOCATION ON DRAWINGS IN ORDER TO COMPLETE MR A-658562

CCB APPROVAL 15A PWL BP DATE 4/25/90

13 REQUESTED BY	ORGANIZATION	EXT.	DATE	NEED DATE	REVIEWED BY	DATE
14 ROBERT M. NIMETZ	NE-EE	1062	4/14/90	7/2/90	C.C. Lyke	4/17/90

PROBLEM SOLUTION/APPROVED CHANGE (INCLUDE BASIS FOR APPROVAL)

(SEE ATTACHED PAGE 2 FOR CONTINUATION OF BLOCK 16)

RIMS NO. B26901121308

16 AFFECTED DOCUMENT NOS.	TYPE	STATUS
17 (SEE PAGE 3)		

STATUS
CI-CHANGE TO BE INCORPORATED
CN-CHANGE NOT TO BE INCORPORATED
NC-NO CHANGE-INFO ONLY
RL-RELATED DOCUMENT-FOR REFERENCE

CIVIL ISSUES? 18 ☐ YES ☒ NO
ENVIRONMENTAL? 19 ☐ YES ☒ NO
APPENDIX R IMPACT? 20 ☐ YES ☒ NO
SAFETY RELATED? 21 ☐ YES ☒ NO
SAR CHANGE? 22 ☐ YES ☐ NO
ALARA IMPACT? 23 ☐ YES ☒ NO

ANSWERED BY (RESP. ENGR.) 24	DATE	30
RESP. LEAD ENGR. 25	DATE	31
OTHER 26	DATE	DESIGN VERIFICATION 32 — DATE
OTHER 27	DATE	WORK COMPLETION 33 — NWR ☐ — DATE
QA 28	DATE	INSP. REPORT NO &/SIG 34 — DATE
PROJ. ENGR. 29	DATE	FINAL WORK TRACKING CLOSURE 35 — DATE

BN EEB-MS-TI15-0011 RO
Page H45 of H72
bulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Ama Sundar. Date 1/22/90 Checked R.H. Buchholz Date 1/26/90
R.H. Buchholz 1/17/90 Brad Holley 1/25/90
GL Bates 2/5/90 R Sufkar 2-5-90

1-MCC-214-B2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
5F1	0-HTR-30-RM2	B020	N/A	Y 20	N/A	N/A	1	D15A030	N 30A	10	1PL3385
6B	1-MTR-30-26	A010	3	1 45	1	T32	←	N/A	→	12	1PL2913
6E1	1-HTR-30-AB7	B020	N/A	Y 20	N/A	N/A	1	D15A030	N 30A	10	1PL3381
6F1	1-HTR-30-T1B	B020	N/A	Y 20	N/A	N/A	1	D15A030	N 30A	10	1PL3430
7D C (TMB 12-13-90 GCP 12-13-90)	0-HTR-31-421	FJ3-B225	HI	Y 2000	N/A	N/A	←	N/A	→	300	1PL3440 R9
7E2	0-HTR-31-72	EF3-B030	N/A	1 30	N/A	N/A	1	D15A030	Y 30A	8	1PL2977
7F1	1-HTR-30-NM2	B050Z	N/A	1 50	N/A	N/A	1	D15A050	Y 50A	6	1PL3421
8F1	0-TB-31-494	B040	N/A	1 40 Y	N/A	N/A	1	D15A050	Y 50A N	6 10 10	1PL6470 1PL6473 1PL6474
8F2	1-P0-214-10	B100	N/A	Y 100	N/A	N/A	1	D15AB100	Y 100A	2	1PL2785
9A	1-MTR-30-CRB	FJ3-B125	LO	Y 750	N/A	N/A	←	N/A	→	4/0	1PL3671

ATTACHMENT NO. ECN 6670
CALC NO. WBN-EEB-MS-TI15-0011

Prepared by WHT Date 5-8-91

Checked by B. Fitzgerald Date 5-8-91

Sheet 1

TABLE OF CONTENTS

This Attachment Package contains 4 total pages.

1.0 PURPOSE AND SCOPE

1.1 Purpose

The purpose of this attachment is to evaluate and support the modifications to be implemented under ECN 6670.

This attachment documents the roll-up of mini calculation no. WBPE0318808039, which affects all the baseline calculations shown below. The attachment is tailored to the specific baseline calculation shown in the heading above.

Baseline Calculations	Calculation No.
480V NON 1E (RG 1.75)	WBN EEB-MS-TI15-0011
TELAS	WBN EEB-MS-TI05-0001

1.2 Scope

The scope of this attachment is to analyze short circuit current, for the 480V Non-Class 1E power cables PL6340 and PL6341.

2.0 CRITERIA

See Baseline Calcualtion

3.0 ASSUMPTIONS

See Baseline Calculation

4.0 SOURCE OF DESIGN INPUT REFERENCES

4.1 480V AC 1E Coordination/Protection calculation WBN-EEB-MS-TI08-0008

4.2 Departmental Guidelines for Electrical Mini Calculation Roll-up, ELEC-004. dated 4-30-91 CJH 7-31-91 BF 7-31-91

4.3 ECN 6670 (RIMS # B26 900920 816)

4.4 Calc. #WBPE0318808040 R0.

5.0 DESIGN INPUT DATA

The design input data consists of the following: Protective device data was taken from Reference 4.4.

6.0 COMPUTATION/ANALYSIS

See Appendix

7.0 SUMMARY OF CALCULATION RESULT

See Appendix

8.0 CONCLUSION

The settings are acceptable since they do not exceed the criteria for the maximum protective device rating for a #8 AWG cable. (Established in Rev. 0 of the baseline calculation Appendix A Page A2)

9.0 APPENDIX

Tabulation of Non-1E Power Circuits located in Category 1 Structures.

ATTACHMENT NO. ECN 6670
CALC NO. WBN-EEB-MS-TI15-0011

Prepared by WJH Date 5-8-91

Checked by B. Fitzgerald Date 5-8-91

Appendix

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

COMPT. NO.	SERVICE	BKR TYPE EF3	Set POS	TRIP RATING (A)	STR SIZE	OL HTR CAT # G30	SECONDARY PROTECTION MFG	MODEL	RATING	CABLE SIZE	CABLE NO.
1-MCC-209-C/5F1	0-ACU-31-5301	B015	N/A	15	N/A	N/A	N/A	N/A	N/A	8	PL6340
2-MCC-209-C/5F1	0-ACU-31-5302	B020	N/A	20	N/A	N/A	N/A	N/A	N/A	8	PL6341

ATTACHMENT P-00972-B
CALC NO. WBN-EEB-MS-TI15-0011

Prepared by B Fitzgerald Date 7-31-91

Checked by [illegible] Date 7-31-91

Sheet 1

TABLE OF CONTENTS

This Attachment contains 4 total pages.

Prepared by B. Fitzgerald Date 7-31-91

Checked by WJH Date 7-31-91

1.0 PURPOSE AND SCOPE

1.1 Purpose

The purpose of this attachment is to evaluate and support the modifications to be implemented under DCN P-00972-B.

This attachment documents the roll-up of mini calculation no. WBPE0448805054, which affects all the baseline calculations shown below. The attachment is tailored to the specific baseline calculation shown in the heading above.

Baseline Calculations	Calculation No.
480V NON 1E (RG 1.75)	WBN EEB-MS-TI15-0011
TELAS	WBN EEB-MS-TI05-0001

1.2 Scope

The scope of this attachment is to analyze protective devices for the 480V Non-Class 1E power cables 1PL1365, 1PL1375, 1PL1370 and 1PL1380.

2.0 CRITERIA

See Baseline Calcualtion

3.0 ASSUMPTIONS

See Baseline Calculation

4.0 SOURCE OF DESIGN INPUT/REFERENCES

4.1 Calc. #WBPE0448806001 R0.

4.2 Departmental Guidelines for Electrical Mini Calculation Roll-up, ELEC-004. (Dated April 30, 1991)

4.3 DCN P-00972-B

.0 DESIGN INPUT DATA

The design input data consists of the following: Protective device data was taken from Reference 4.3.

6.0 COMPUTATION/ANALYSIS

See Appendix

7.0 SUMMARY OF CALCULATION RESULT

See Appendix

8.0 CONCLUSION

The settings are acceptable since they do not exceed the criteria for the maximum protective device ratings for #4 & #8 AWG cable. (Established in Rev. 0 of the baseline calculation Appendix A Page A2)

9.0 APPENDIX

Tabulation of Non-1E Power Circuits located in Category 1 Structures.

Prepared by B. Fitzgerald Date 7-31-91

Checked by CJH Date 7-31-91

Appendix

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

COMPT. NO.	SERVICE	BKR TYPE EF3	Set POS	TRIP RATING (A)	STR SIZE	OL HTR CAT # G30	SECONDARY PROTECTION MFG	MODEL	RATING	CABLE SIZE	CABLE NO.
1-MCC-210-A/7A	1-MTR-44-61	L050	2	210	2	T48	N/A	N/A	N/A	4	1PL1365
1-MCC-210-A/7B	1-MTR-44-68	A025	3	125	1	T41	N/A	N/A	N/A	8	1PL1375
1-MCC-210-B/7A	1-MTR-44-87	L050	2	210	2	T48	N/A	N/A	N/A	4	1PL1370
1-MCC-210-B/7B	1-MTR-44-81	A025	3	125	1	T41	N/A	N/A	N/A	8	1PL1380

NE Calculation No. WBN-EEB-MS-TI15-0011

Prepared by [signature] Date 06-17-91

Checked by B. Fitzgerald Date 6-17-91

TABLE OF CONTENTS

This attachment contains 9 pages.

1.0 PURPOSE AND SCOPE

1.1 Purpose

The purpose of this attachment is to evaluate and support the modifications to be implemented under DCN P-03437-A. Drawings 45B1773-7D R0, 45B1773-9A R1, 45B1771-8B R1, 45W756-8 R12, 45W756-7 R17 and 45W756-4 R11 need to be revised to specify breaker trip settings.

This attachment (protection trip setting calculation is documented in mini calculation No. WBPE0018906004) affects the baseline calculations shown below. This attachment is tailored to the specific baseline calculation shown in the heading above.

Baseline Calculation	Calculation No.
~~480V AC 1E COORDINATION/PROTECTION~~	~~WBN-EEB-MS-TI08-0008~~ J.I.H. 06-20-91 BF 6-20-91
480V NON-CLASS 1E POWER CABLE ASSOCIATE CIRCUITS (RG1.75)	WBN-EEB-MS-TI15-0011

1.2 Scope

The scope of this attachment is to modify page 170 of 200 (Appendix H, Page H42 of H72) of the Baseline Calculation to reflect implementation of DCN No. P-03437-A.

2.0 ASSUMPTIONS

See Baseline Calculation.

3.0 SOURCES OF DESIGN INPUT INFORMATION (REFERENCES)

3.1 DCN No. P-03437-A

3.2 Baseline Calculation

3.3 Departmental Guidelines for Electrical Mini Calculation Roll-up, Elec-004 dated 04/30/91.

4.0 DESIGN INPUT DATA

Description of Data	Source of Data
a. Load Description 1-HTR-1-CBS	Field Verification Data Sheet
Cont Bldg Steam Gen Htr	Field Verification Data Sheet
b. Rating 75 KW	Field Verification Data Sheet
c. Full load current 91 A	Field Verification Data Sheet
d. Existing Breaker Type/Frame ET/FJ	Field Verification Data Sheet
e. Existing Breaker Catalog No. FJ3-B125	Field Verification Data Sheet
f. Existing Breaker	Field Verification Data Sheet
Cont. Rating 125 amp	
g. Existing Breaker Trip Setting Position 4	Field Verification Data Sheet
h. Existing Breaker Trip	Field Verification Data Sheet
Current 1500 amp	

5.0 DOCUMENTATION OF INPUT/ASSUMPTIONS

See Baseline Calculation

6.0 COMPUTATION/ANALYSIS

Instantaneous Trip Current Rating and Trip-Setting Position for the Control Building Steam Generator Circuit Breaker

This tripping function is to provide the short circuit protection for the load and its incoming feeder cable and as such shall be selected to provide the most sensitive protection while allowing reliable operation. The trip setting shall also be coordinated with the trip setting of the upstream protective device so that an acceptable tripping selectivity can be achieved in the event of a short circuit fault.

1. The control Building Steam Generator Heater (1-HTR-1-CBS) is essentially a resistive load with no apparent inrush current involved.

2. The breaker instantaneous trip setting selected is based on common industry acceptable practice, which is 8 to 10 times the circuit FLA.

   a. 8 x Circuit FLA = 8 x 91 = 728 amps

   b. Trip setting selected: 750 amps

   c. Trip position selected: Lo

3. Is the existing breaker trip position (4) acceptable?

   Yes_____ No__X__

7.0 SUPPORTING GRAPHICS

Not applicable

8.0 SUMMARY OF RESULTS

Circuit Protection	Required	Existing	Acceptable	Change
1-MCC-214-A2/8B-A				
Breaker Ratings	125	125	Yes X No__	No
Breaker Set Point/Amp	LO/750	4/1500	Yes__ No X	Yes

9.0 CONCLUSION

Change Control Bldg Steam Generator Heater (1-HTR-1-CBS) breaker instantaneous trip setting from position 4 (1500 amps) to position Lo (750 amps) at 1-MCC-214-A2-A compartment 8B.

10.0 APPENDICES

Appendix A	Field Verification Data Sheet
Appendix B	Page 170 of 200 (Appendix H, H42 of H72) of Baseline Calculation

Attachment P-03437-A
480V Non-Class 1E Power Cable
Associated Circuits

NE Calculation No. WBN-EEB-MS-TI15-0011

Prepared by Jon Turner Date 06-17-91

Checked by Brian Fitzgerald Date 6-17-91

Appendix A
Sheet 1 of 3

BOARD UNID NO. 1-MCC-214-A2-A BOARD NAME 480V CONT & AUX BLDG VT BD

COMPARTMENT NO. 8B LOAD UNID NO. 1-HTR-1-CB5

DESCRIPTION - CONTROL BLDG STEAM GENERATOR

SINGLE LINE DRAWING REFERENCE 4CW756-4

A. PRIMARY CIRCUIT BREAKER
1. Manufacturer ITE
2. Model/Catalog No. FJT3-B125
3. Type ADJUSTABLE
4. Continuous Current Rating 125A
5. Instantaneous Setting (For Adjustable Breakers) 4
6. Serial No. N/A per 6/6/88 NCR 6-6-88

B. SECONDARY PROTECTIVE DEVICE
1. Location
2. Manufacturer
3. Type
4. Continuous Current Rating (Adjustable Breakers)
5. Instantaneous Setting (For Adjustable Breakers)
6. Serial No.

C. TRIP ELEMENT N/A per 6/6/88 NCR 6-6-88
1. Manufacturer
2. Model/Catalog No.
3. Frame Size
4. Trip Size

D. OVERLOAD HEATER
1. Manufacturer
2. Catalog No.
3. Size

E. CONTROL TRANSFORMER
1. Manufacturer
2. Model/Catalog No.
3. Size
4. UNID

F. STARTER/CONTACTOR
1. Manufacturer
2. Model/Catalog No.
3. Size

G. PRIMARY CONTROL CIRCUIT FUSE
1. Manufacturer
2. Model/Catalog No. LP 6/6/88
3. Size
4. Type NCR 6-6-88
5. UNID

H. SECONDARY CONTROL CIRCUIT FUSE (If Applicable)
1. Manufacturer
2. Model/Catalog No.
3. Size
4. Type
5. UNID

I. SERVICE LOADS NAMEPLATE ON MCC MATCH SINGLE LINE
YES ✓ NO

LEGIBILITY EVALUATED and ACCEPTED for issue.

Signature 7/14/89 Date

CABLE NUMBER(S) 1-UPL-1-3680
(For power cables entering and/or leaving compartment)

Prepared By Ray Tan
Date 6/10/88

Verified By James D. Higgins
Date 6-16-88

1487x

Attachment P-03437-A
480V Non-Class 1E Power Cable
Associated Circuits

NE Calculation No. WBN-EEB-MS-TI15-0011

Prepared by Jon Jerrow Date 06-17-91

Checked by B. Fitzgerald Date 6-18-91

Appendix A
Sheet 2 of 3

ACCEPTABLE LEGIBILITY

SIGNATURE 7/13/89 DATE

BOARD 1-MCC-214-A2-A COMPT 8B

LOAD DESCRIPTION CONTROL BLOC STEAM GENERATOR

LOAD LOCATION C1Q/755

POWER RATING 75 KW

NAMEPLATE DATA BELOW:

PRECISION parts corporation
NASHVILLE, TENNESSEE

ASME
S
NAT'L. BD

MODEL J1
SERIAL 6967
K.W. 75
____ B.T.U./HR
VOLTAGE 480 PHASE 3
AMPERES 91
5 STEPS OF 15 K.W.
____ STEPS OF ____ K.W.

MAX. W.P. 150 P.S.I. STM
M.S.V.R CAP.
____ B.T.U/HR
263 LB/HR
DATE
APR '75

CONTINUED ON NEXT PAGE

Prepared By Jeffrey R. Dotta
Date 4-26-88

Verified By William C. Cielo
Date 4-26-88

NE Calculation No. WBN-EEB-MS-TI15-0011

Prepared by Jon Jennel Date 06-17-91

Checked by B. Fitzgerald Date 6-18-91

BOARD 1-MCC-214-A2-A COMPT 8B

BREAKER DATA BELOW:

NOMINAL INSTANTANEOUS TRIP SETTINGS - AMPERES AC					DC ADD 15% TO NOMINAL. TOLERANCES ON ALL SETTINGS ±10%
LO	2	3	4	HI	
750	960	1300	1500	1600	

CURRENT INTERRUPTING RATING
MAX. RMS. SYM. AMPERES
240 VOLTS 22,000 AMPERES
480 VOLTS 18,000 AMPERES
600 VOLTS 14,000 AMPERES

UND. LAB. INC. LISTED
CIRCUIT BREAKER
3-POLE UNIT ISSUE LA831
600 VAC 125/250 V.D.C.
CAT. NO. FJ3-B125
ITE | ITE IMPERIAL CORPORATION PHILADELPHIA, PENNSYLVANIA, USA

40C
CU/AL

ACCEPTABLE LEGIBILITY
SIGNATURE 7/13/89 DATE

Prepared By Ray Ji
Date 6/6/88

Verified By James D. Higgins
Date 6-6-88

Attachment P-03437-A
480V Non-Class 1E Power Cable
Associated Circuits

NE Calculation No. WBN-EEB-MS-TI15-0011

Prepared by Jon Jarrell Date 06-17-91

Checked by B. Fitzgerald Date 6-18-91

Appendix B

1-MCC-214-A2

COMPT NO	SERVICE	BKR TYPE (*EF3-)	SET POS	TRIP RATING (A)	STR SIZE	OL HTR CAT # G30	SECONDARY PROTECTION MFR	MODEL	RATING	CABLE SIZE	CABLE NO
4F1	1-HTR-30-CCRD	B020	N/A	Y 20	N/A	N/A	1	DISA030	N 30A	10	IPL3268
5A	1-MTR-30-301	A010	3	Y 45	1	T34	←	N/A	→	12	IPL3435
5E1	0-HTR-31-83	B030	N/A	Y 30	N/A	N/A.	1	DISA030	Y 30A	8	IPL3707
5F1	1-HTR-30-XM1A	B020	N/A	Y 20	N/A	N/A.	1	DISA030	N 30A	10	IPL3370
5F2	1-HTR-30-AB1	B020	N/A	Y 20	N/A	N/A	1	DISA030	N 30A	10	IPL3314
6E1	1-HTR-30-SMS	B030	N/A	Y 30	N/A	N/A.	1	DISA030	Y 30A	8	IPL2811
6E2	1-HTR-30-NM1	B050	N/A	Y 50	N/A	N/A.	1	DISA050	Y 50A	6	IPL2806
6F2	0-HTR-30-RM1	B020	N/A	Y 20	N/A	N/A	1	DISA030	N 30A	10	IPL3320
7D2	0-HTR-30-AFH	B040	N/A	Y 40	N/A	N/A	1	DISA050	Y 50A	6	IPL3335
7E1	1-HTR-30-U1A	B020	N/A	Y 20	N/A	N/A.	1	DISA030	N 30A	10	IPL2813
7E2	0-HTR-30-BFH	B040	N/A	Y 40	N/A	N/A	1	DISA050	Y 50A	6	IPL3330
7F2	0-HTR-30-CFH	B040	N/A	Y 40	N/A	N/A.	1	DISA050	Y 50A	6	IPL3340
8A	1-MTR-30-CRD	FXD63 ~~-33~~ B125	LO ~~H~~	Y 800 ~~1600~~	N/A	N/A.	←	N/A	→	2/0	IPL3692
8B	1-HTR-1-CBS	FJ3 B125	LO ~~H~~	Y 750 ~~1500~~	N/A	N/A	←	N/A	→	4/0	IPL3680

DCN P-03437-A
J.I.H. 06-17-91

* EXCEPT AS NOTED

1.0 PURPOSE & SCOPE

1.1 PURPOSE

The purpose of this attachment is to evaluate and support modifications to be implemented under DCN M-13300-B.

Modifications involve the reclassification and re-route of cable no. PL3390.

Cable PL3390 was originally designed as a voltage class 3. Upon further review, it was determined that this cable, which feeds a 10HP motor, should be re-classified as voltage class 4. DCN M13300 was generated to re-classify this cable.

The following baseline calculations evaluate the DCN modifications for their impact. These evaluations are identified by the attachment No M13300B and are included in the calculation noted.

BASELINE CALCULATION	CALCULATION NO.
AUXILIARY POWER SYSTEM ANALYSIS	WBN EEB-MS-TI06-0002
480V NON-CLASS 1E POWER CABLE ASSOCIATED CIRCUITS	WBN EEB-MS-TI15-0011
CABLE AMPACITY - NV4 AND NV5 CABLES IN CLASS 1E RACEWAYS	WBPEVAR8909010

1.2 SCOPE

This attachment documents data for cable PL3390 which is being reclassified from voltage level V3 to V4 per DCN M-13300-B. It determines if cable protection is adequate so not to degrade possible associated class 1E cables below an acceptable limit.

2.0 ASSUMPTIONS

See "Assumptions" in base calculation (section 2.0).

3.0 SOURCES OF DESIGN INPUT/REFERENCES

3.1 Drawing #1-45W733-5 R0

3.2 Calculation, 480VAC 1E Coordination and Protection, WBN EEB-MS-TI08-0008

3.3 Calculation, Cable ampacity - NV4 And NV5 Cables In Class 1E Raceways, WBPEVAR8909010 R18

3.4 See base calc.

4.0 DESIGN INPUT DATA

4.1 Protective device size documented in Ref. 3.1 and 3.2.

4.2 Proposed adequate cable size in Ref. 3.3.

4.3 Input data consist of cable and protective device time current curves and associated data from 3.4.

5.0 JUSTIFICATION OF ASSUMPTIONS

5.1 See "Justification of Assumptions" in base calculation (section 5.0).

6.0 METHODOLOGY

6.1 The protected device listed on the calculation (Ref. 3.2) is a Gould-Shawmut fuse #TRS-20R (20A dual element/time delay). The protective device shown on the drawing (Ref. 3.1) is a 15 AMP fuse, this fuse will be replaced by a 20 AMP per DCN M-12212-A.

6.2 Calculation (Ref. 3.3) identifies the minimum required cable size as a #8.

6.3 The methodology is similar to that used in previous revisions of the base calculation.

Appendix H (page H27) was revised to document the applicable cable and protection device data.

The cable size was compared to the protective device data and time current curves (Appendix C & D of the base calculation), to determine if the proposed cable size was adequately protected by a TRS-20R (20 AMP fuse).

7.0 GRAPHICS

Graphics consist of the applicable time-current plots in the base calculation (Appendix C & D).

8.0 SUMMARY OF RESULTS

8.1 A TRS-20R fuse will adequately protect a #8 cable.

9.0 CONCLUSIONS

Cable PL3390 is adequately protected by the fuse (TRS-20R).

Cable protection is adequate since cable is required to be protected by at least one acceptable fuse.

It should be noted that currently a 15 Amp fuse is installed as required by drawing 1-45W733-5 and that DCN M-12212-A is replacing that required 15 Amp fuse with a 20 Amp fuse (TRS-20R).

10.0 ATTACHMENTS / ADDITIONAL DATA

Calculation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchert Date 1/22/90 Checked [illegible] Date 1/27/90
R.H. Buchert 1/10/90 Dwg Kelley 1/25/90
M.L. Bates 2/5/90 R Sripkar 2-5-90

O-MCC-215-C2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		GE TED		(A)		G30	MFR	MODEL	RATING		
GK	O-JB-287-4784	136Y T150	N/A	150	N/A	N/A	1	A4J90	Y 90A	2 2	PL3280 PL3281 thru PL3285
GR	O-HTR-30-326	136Y T150	N/A	150	N/A	N/A	1	A4J20	Y 20A	12	PL3279
DN	O-MTR-18-110	N/A	N/A	N/A	N/A	C163B	GOULD SHAWMUT	TRS-20R	20A	8	PL3390

13

ATTACHMENT NO. M-15092-A
CALC. NO. WBN EEB-MS-TI15-0011

PREPARED BY: JFM DATE: 12-10-91
REVIEWED BY: DC DATE: 12-11-91

PURPOSE

The purpose of this Attachment is to evaluate and support modifications to be implemented under the following DCN: M-15092-A

This Attachment evaluates the adequacy of Unit 1 System group protective devices for 480V power cables associated circuits.

This Attachment affects the following calculations:

BASELINE CALCULATION	CALCULATION NO.
480V Non-Class 1E Power Cable Associated Circuits	WBN EEB-MS-TI15-0011

1.0 SCOPE

This Attachment documents data for cable 1PL3017 which is being replaced for ampacity failure with a #6 cable. This Attachment will also document protection adequacy for this cable.

2.0 ASSUMPTIONS

See "Assumptions" in the base Calculation (Section 2.0).

3.0 SOURCES OF DESIGN INPUT/REFERENCES

3.1 Calculation WBPEVAR8909010 - Ampacity (Appendix I).

3.2 Appendix A of the base Calculation.

4.0 DESIGN INPUT DATA

4.1 Calculation WBPEVAR8909010 provides the data for the new cable size.

4.2 Provides the protection criteria for cable size.

5.0 JUSTIFICATION OF ASSUMPTIONS

See "Justification of Assumptions" in base Calculation (Section 5.0).

6.0 METHODOLOGY

The methodology for this Attachment is similar to that used in the base Calculation. The cable size is shown on the applicable sheet of Appendix H. Appendix A was reviewed to determine if adequate cable protection exists.

7.0 SUPPORTING GRAPHICS

None.

8.0 SUMMARY OF RESULTS

Appendix A, page A2, shows a SHMT-HFLP 30A (D15A030) will protect a #8 @ 90° C for 10 seconds. Therefore, cable 1PL3017, which is being changed to a #6 @ 90° C, will also be protected by this fuse.

9.0 CONCLUSIONS

Cable 1PL3017, which is fed from 1-MCC-214-B1-B Comp. 13F1, is adequately protected in regards to the proposed increase in cable size to be implemented by DCN M-15092-A.

CN EEB-MS-TI15-0011 R0

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Kmaylmeclar Date 1/22/90 Checked R.A. Buchert Date 1/26/90
R. A. Buchert 1/10/90 Doug Kelley 1/25/90

1-MCC-214-B1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING (A)	STR SIZE	OL HTR CAT# G30	SECONDARY PROTECTION MFR	MODEL	RATING	CABLE SIZE	CABLE NO
		EF3-									
2D	1-MTR-81-7	H050	2	Y400	3	T52	←	N/A	→	6	1PL3228
2F1	0-DXF-234-B1	B020	N/A	Y20	N/A	N/A	1	D15A030	Y30A	8	1PL3740
2F2	0-TB-40-66	B020	N/A	Y20	N/A	N/A	1	D15A030	N30A	10	1PL3730
9F1	1-PNL-55-L236	B020	N/A	Y20	N/A	N/A	1	D15A030	N30A	10	1PL2972
12A	1-MTR-30-181	A010	3	Y45	1	T33	←	N/A	→	10	1PL3021
12E1	0-PNL-90-L397	B020	N/A	Y20	N/A	N/A	1	D15A030	N30A	10	1PL3609
12F1	1-RE-90-99	B020	N/A	Y20	N/A	N/A	1	D15A030	N30A	10	1PL3790
13A	1-MTR-84-21	A005	3	Y22	1	T23	←	N/A	→	12	1PL2948
13B	0-MTR-84-11	A005	3	Y22	1	T24	←	N/A	→	12	1PL3465
13C	1-MTR-65-74	A025	LO	Y75	1	T37	←	N/A	→	12	1PL3660
13F1	0-DXF-234-B4	B020	N/A	Y20	N/A	N/A	1	D15A030	~~N~~ Y30A	6 ~~10~~	1PL3017

B DCN M-15092 JEM

Form GO-3.08.1 Rev. 2 SL-F647 04/84

Prepared by Moe Rogani Date 4/21/92

Checked by Jon Tomm Date 04-21-92

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This Attachment contains 9 total pages.

THIS SHEET ADDED BY REVISION 15

1.0 PURPOSE AND SCOPE

1.1 Purpose

The purpose of this attachment is to evaluate and support the modifications to be implemented under DCN M-08614-A.

This attachment evaluates the adequacy of the protective devices for 480V power cables associated circuits originally identified in Appendix F of this baseline calculation.

This attachment affects the following calculation:

Baseline Calculation	Calculation No.
480V Non-Class 1E Power Cable Associated Circuits	WBN EEB-MS-TI15-0011

1.2 Scope

This attachment evaluates the adequacy of the remaining seventy (70) 480V power cables associated circuits protective devices that were originally identified in Appendix F of this baseline calculation (WBN EEB-MS-TI15-0011) and were not evaluated as part of DCN M-08613-A. In addition this attachment revises Appendix G of this baseline calculation.

This attachment also updates ~~and reevaluates~~ protective devices to resolve discrepancies between baseline calculation WBN EEB-MS-TI15-0011 Appendix H and baseline calculation WBN EEB-MS-TI08-0008 Attachment M12212A. The protective devices that did not meet the cable protection criteria of the baseline calculation WBN EEB-MS-TI15-0011 are listed below and will be reevaluated via future revisions of baseline calculations WBN EEB-MS-TI15-0011 and WBN EEB-MS-TI08-0008 in support of DCN M-8614-A issue:

m.r. 4/24/92
J.L.H. 04-24-92

0-MCC-208-A	Compt No. 7C, 8B, 8C, 8D.
0-MCC-217-A	Compt No. 3E, 4E.
0-MCC-218-1	Compt No. 6D.
1-MCC-210-A	Compt No. 3F2
1-MCC-214-A1	Compt No. 2F2
1-MCC-232-A	Compt No. 4D
1-MCC-232-B	Compt No. 6C
2-MCC-214-A1	Compt No. 2F2
2-MCC-209-A	Compt No. 7D
2-MCC-232-A	Compt No. 4D
2-MCC-232-B	Compt No. 6C

2.0 ASSUMPTIONS

See "Assumptions" in baseline calculation (Section 2.0).

3.0 SOURCES OF DESIGN INPUT INFORMATION (REFERENCES)

3.1 Calculation WBN EEB-MS-TI08-0008 R17, "480V 1E Coordination/Protection".

3.2 WBN Computer Cable Routing System (CCRS) - July 7, 1989.

3.3 Wiring Diagrams, Periodic Breaker Test 85E-45B710-Series drawings.

3.4 Drawing 1-15E500-1 R0, "Key Diagram - Station Aux Power System".

3.5 Drawing 1-15E500-2 R0, "Key Diagram - Station Aux Power System".

3.6 Drawing 1-45W756-5 R2, "Wiring Diagrams - 480V Cont & Aux Bldg VT BD 1B1-B & 2B1-B Single Line Sh-1".

3.7 Drawing 1-45W756-6 R1, "Wiring Diagrams - 480V Cont & Aux Bldg VT BD 1B1-B & 2B1-B Single Line Sh-2".

3.8 Drawing 1-45W755-3 R0, "Wiring Diagrams - 480V Reactor Vent BD 1B-B & 2B-B Single Line Sh-1".

3.9 Drawing 1-45W755-4 R0, "Wiring Diagrams - 480V Reactor Vent BD 1B-B & 2B-B Single Line Sh-2".

3.10 Drawing 1-45W755-1 R0, "Wiring Diagrams - 480V Reactor Vent BD 1A-A & 2A-A Single Line Sh-1".

3.11 Drawing 1-45W755-2 R0, "Wiring Diagrams - 480V Reactor Vent BD 1A-A & 2A-A Single Line Sh-2".

3.12 Drawing 1-45W755-3 R0, "Wiring Diagrams - 480V Reactor Vent BD 1B-B & 2B-B Single Line Sh-1".

3.13 Drawing 1-45W755-4 R0, "Wiring Diagrams - 480V Reactor Vent BD 1B-B & 2B-B Single Line Sh-2".

3.14 Drawing 1-45W756-1 R2, "Wiring Diagrams - 480V Cont & Aux Bldg Vt BD 1A1-A & 2A1-A - Single Line Sh-1".

3.15 Drawing 1-45W756-2 R1, "Wiring Diagrams - 480V Cont & Aux Bldg Vt BD 1A1-A & 2A1-A - Single Line Sh-2".

3.16 Drawing 1-45W744-1 R0, "Wiring Diagrams - 480V Auxiliary Bldg Com MCC A Single Line Sh-1".

3.17 Drawing 1-45W744-2 R1, "Wiring Diagrams - 480V Auxiliary Bldg Com MCC A Single Line Sh-2".

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3.18 Drawing 1-45W744-3 R1, "Wiring Diagrams - 480V Auxiliary Bldg Com MCC B Single Line Sh-1".

3.19 Drawing 1-45W744-4 R3, "Wiring Diagrams - 480V Auxiliary Bldg Com MCC B Single Line Sh-2".

3.20 Drawing 1-45W743-2 R0, "Wiring Diagrams - 480V Fuel & Waste Handling BD".

3.21 Drawing 1-45W757-1 R0, "Wiring Diagrams - 480V Turbine Bldg Vent BD 1A & 2A Single Line".

3.22 Drawing 1-45W757-2 R0, "Wiring Diagrams - 480V Turbine Bldg Vent BD 1A & 2A Single Line".

3.23 Drawing 1-45W745 R0, "Wiring Diagrams - 480V Lube Oil Board Single Line".

3.24 Drawing 1-45W744-5 R0, "Wiring Diagrams - 480V Aux Bldg Com MCC C Single Line Sh-1".

3.25 Drawing 1-45W744-6 R1, "Wiring Diagrams - 480V Aux Bldg Com MCC C Single Line Sh-2".

3.26 Drawing 1-45W751-1 R1, "Wiring Diagrams - 480V Reac MOV BDS 1A1-A & 2A1 Single Line Sh-1".

3.27 Drawing 1-45W751-2 R1, "Wiring Diagrams - 480V Reac MOV BDS 1A1-A & 2A1 Single Line Sh-2".

3.28 Drawing 1-45W751-3 R1, "Wiring Diagrams - 480V Reac MOV BDS 1A1-A & 2A1 Single Line Sh-3".

3.29 DCN M-08614-A

3.30 DCN M-07633-A

THIS SHEET ADDED BY REVISION 15

4.0 DESIGN INPUT DATA

4.1 Calculation WBN EEB-MS-TI15-0011, Attachment M08613A lists the remaining (70) inadequate protective devices for 480V power cables associated circuits that will be evaluated in this Attachment (M08614A). These remaining inadequate protective devices are identified in Appendix F as "NOT CROSSED OUT".

4.2 Calculation WBN EEB-MS-TI08-0008, Attachment M12212A (Ref. 3.1) provides updated settings for coordination of Class 1E protective devices used to update Appendix H of this baseline calculation.

4.3 WBN Computer Cable Routing System (Reference 3.2) provides the latest cable sizes utilized in Appendix H of this baseline calculation.

4.4 Drawings 1-15E500-1 & 2 (References 3.4 & 3.5) correlates the names and numbers of MCCs and boards with corresponding wiring diagrams.

4.5 Design Change Notice DCN M-07633-A provides the replacement secondary protective device for 1-BD-212-B2 compartment 3B.

5.0 JUSTIFICATION OF ASSUMPTIONS

See "Documentation of Assumptions" in Baseline Calculation (Section 5).

6.0 CRITERIA

Calculation WBN EEB-MS-TI15-0011, Attachment 1, Appendix A provides the acceptance criteria for the adequate protective devices with respect to the cable sizes. Section 1.1 (Scope) of this baseline calculation provides protective devices periodic testing requirements.

7.0 METHODOLOGY

7.1 Evaluate the adequacy of the remaining (70) protective devices listed in Attachment M08613A of this baseline calculation and reevaluate the adequacy of the protective devices affected by calculation WBN EEB-MS-TI08-0008 Attachment M12212A. The protective devices were compared against the acceptance criteria of Appendix A (Attachment 1) of this baseline calculation.

Breakers that are adequately protecting cables will be included in the periodic testing program (Ref. 3.3) via DCN M-08614-A.

7.2 Protective devices listed in Appendix H of this calculation were updated based upon the information provided in calculation WBN EEB-MS-TI08-0008 Attachment M12212A. The protective devices were then compared to the acceptance criteria of Appendix A to reevaluate the acceptability of the protective device.

7.3 Appendix F was then modified based on the following:

** Protective device was evaluated to be included in the periodic test program per attachment M08613A.

**** Protective device was evaluated to be included in the periodic test program per attachment M08614A. Cable is protected, per Appendix A requirements, by a single breaker only.

*** Protective device was evaluated to be acceptable per attachment M08614A. Cable is protected by at least one fuse, one fuse and one breaker or two breakers in series which meets Appendix A requirements.

***** Protective device to be replaced or reset per attachment M08614A. Resulting protection (Sec. 9.2 Remarks) is acceptable per Appendix A requirements. reevaluated via future revisions of baseline calculations WBN EEB-MS-TI15-0011 and WBN EEB-MS-TI08-0008 in support of DCN M-8614-A issue.

****** Protective device to be replaced or reset per attachment M08613A. Resulting protection is acceptable per Appendix A requirements.

******* The circuit containing the protective device has been spared.

7.4 Appendix 1 (originally Appendix F of this baseline calculation) includes the list of all the inadequate protective devices evaluated in this attachment.

7.5 Appendix 2 (originally Appendix G of this baseline calculation) includes only the protective device that is revised for typo by this attachment.

7.6 Appendix 3 (originally Appendix H of this baseline calculation) includes only the protective devices that are revised per calculation WBN EEB-MS-TI08-0008 Attachment M12212A, the appropriate configuration control drawings (Reference 3.4 thru 3.28) and evaluated in this attachment.

8.0 SUPPORTING GRAPHICS

Time-current curves for ITE breakers FXD63B125 and FXD63B225 extracted from Attachment F13654A of this calculation (See Appendix 5).

9.0 SUMMARY OF RESULTS

9.1 The following protective devices are to be added to the output document 45B710-Series for periodic breaker testing and to be implemented on DCN M-08614-A.

9.1.1 All protective devices listed in Appendix F of this attachment with two asterisks "**".

9.1.2 All protective devices listed in Appendix F of this attachment with four asterisks "****".

9.2 The following are circuit breaker changes required to protect the 480V Non-Class 1E power cable associated circuits. Reset of these breakers will affect calculation WBN EEB-MS-TI08-0008 Attachment M12212A. The protective devices will be reevaluated via future revisions of baseline calculations WBN EEB-MS-TI15-0011 and WBN EEB-MS-TI08-0008 in support of DCN M-8614-A issue.

480V Bus	Board Name	Compt No.	Bkr Type	Remarks
0-MCC-208-A	Aux Bld Com MCC-A	7C	EF3-H050	Reset adjustable Mag. Overcurrent Trip to less than 495A.
0-MCC-208-A	Aux Bld Com MCC-A	8B	EF3-A025Z	Reset adjustable Mag. Overcurrent Trip to less than 202.5A.
0-MCC-208-A	Aux Bld Com MCC-A	8C	EF3-A025Z	Reset adjustable Mag. Overcurrent Trip to less than 202.5A.
0-MCC-208-A	Aux Bld Com MCC-A	8D	EF3-A025Z	Reset adjustable Mag. Overcurrent Trip to less than 202.5A.
0-MCC-217-A	Chem & Vol BD-A	3E	EF3-L050	Reset adjustable Mag. Overcurrent Trip to less than 315A. J.L.H. 04-24-92 M.R. 4/24/92
0-MCC-217-A	Chem & Vol BD-A	4E	EF3-L050	Reset adjustable Mag. Overcurrent Trip to less than 315A.

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9.2 (Continued)

480V Bus	Board Name	Compt No.	Bkr Type	Remarks
0-MCC-218-1	Lube Oil BD	6D	EF3-L050	Reset adjustable Mag. Overcurrent Trip to less than 315A.
1-MCC-210-A	Turb Bld Vent BD-1A	3F2	EF3-A100	Reset adjustable Mag. Overcurrent Trip to less than 1080A.
1-MCC-214-A1	Cont & Aux Bld BD 1A1-A	2F2	FXD63-B125	Reset adjustable Mag. Overcurrent Trip to less than 810A.
1-MCC-232-A	Reactor Vent BD 1A-A	4D	EF3-L050	Reset adjustable Mag. Overcurrent Trip to less than 315A.
1-MCC-232-B	Reactor Vent BD 1B-B	6C	EF3-L050	Reset adjustable Mag. Overcurrent Trip to less than 315A. J.I.H. 04-24-92 m.r. 4/24/92
2-MCC-214-A1	Cont & Aux Bld BD 2A1-A	2F2	FXD63-B125	Reset adjustable Mag. Overcurrent Trip to less than 810A.
2-MCC-209-A	Turb MOV BD-2A	7D	EF3-L050	Reset adjustable Mag. Overcurrent Trip to less than 202.5A.
2-MCC-232-A	Reactor Vent BD 2A-A	4D	EF3-L050	Reset adjustable Mag. Overcurrent Trip to less than 315A.
2-MCC-232-B	Reactor Vent BD 2B-B	6C	EF3-L050	Reset adjustable Mag. Overcurrent Trip to less than 315A.

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~~APPENDIX H~~
Times 3-7-91

R15 N.A. 4/13/92

~~Page H7 of H172~~

~~EEB-MS-TI15-0011 R0~~
lation of Non-1E Power Circuits Located in Category 1 Structures

Prepared ~~R.H. Buchert~~ R.H. Buchert Date ~~1/22/90~~ 1/12/90 Checked kmgmurdar Date 1/26/90 1/21/90

1-BD-212-A1 (

COMPT NO	SERVICE	BKR MODEL NO	SENSOR RATING (A)	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
2C	1-MTR-30-103	DS-416	~~300~~ Y 200	50	Y ~~8~~ 4	N/A	N/A	Y 700	N/A.	4/0	1PL5140
8A	CHGR 0-~~XS~~-239-1	DS-206	Y 300	~~75~~ 70	Y 20	N/A	N/A	Y 600	COULD/SHUNT CP350C5 Y	300	1PL4931

R15 N.A. 4/13/92 J.I.H. 04-21-92

Form GO-3.08.1 Rev. 2 SL-F647 04/84

THIS SHEET ADDED BY REV 15

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.A. Buchart Date 1/22/90 Checked [illegible] Date 1/26/90
R.A. Buchart 1/10/90 Brian Kelley 1/25/90

1-BD-212-A2

COMPT No	SERVICE	BKR MODEL NO	SENSOR RATING	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
3D	0-MTR-32-25	DS-416	Y 300A	76 ~~75~~	Y 4 ~~12~~	N/A	N/A	Y 600 ~~1000~~	N/A	4/0	1PL5033
										4/0	1PL5085 R15 M.R. 4/13/92
7B	1-MTR-30-159	DS-206	Y 300A	70 ~~66~~	6 ~~12~~	N/A	N/A	Y 700 ~~900~~	Y CP 4/0 C5 GOULD SHAWMUT	4/0	1PL5150 J.I.H. 04-21-92

THIS SHEET ADDED BY REV 15

R15 m.a. 4/13/92

Calculation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Kmyhuder Date 1/22/90 Checked R. H. Buchart Date 1/26/90
R. H. Buchart 1/10/90 Brown Kelley 1/25/90

1-BD-212-B1

COMPT NO	SERVICE	BKR MODEL NO	SENSOR RATING	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
2B	1-MTR-30-102	DS-416	Y ~~300~~ 200 A	~~50~~ 90	Y ~~7.5~~ 4.0	N/A	N/A	Y 700	N/A	4/0	1PL5160
3B	1-MTR-62-101	DS-416	Y 400 A	~~75~~ 80	Y ~~20~~ 4.0	N/A	N/A	Y ~~1000~~ 900	N/A.	400	1PL5025
3D	0-MTR-32-26	DS-416	Y 300 A	~~75~~ 76	Y ~~12~~ 4	N/A	N/A	Y ~~980~~ 600	N/A	400	1PL5089

R15 m.a. 4/13/92

J.I.H. 04-21-92

THIS SHEET ADDED BY REV 15

R15 m.a. 4/13/92
3-7-91

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchert Date 1/22/90 Checked Kay Lucker Date 1/26/90
R.H. Buchert 1/17/90 Steve Kelley 1/25/90
[illegible] 2/5/90 R. Supkar 2/5/90

1-BD-212-B2

COMPT No	SERVICE	BKR MODEL NO DS-	SENSOR RATING (A)	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE 2/15/90	CABLE NO
3B	~~1-CRN-271-R1 1 PENT 293 H~~	416	Y 300	100	Y ~~20~~ 4	N/A	N/A	Y 600	~~CP6A B7~~ Y REQ 2/15/90	400	1PL4610 (REF. 3.30)
									~~350~~ CP4/0C5	300	1PL4611
3D	0-BD-296-~~X~~ A	416	Y 300	100	- 20	~~400~~ 600	~~0.33~~ 0.18	N/A	N/A.	400	1PL4948
7A	1-MTR-30-162	206	Y 300	65	Y ~~12~~ 4	N/A	N/A	Y ~~900~~ 700	Y CP 4/0C5	4/C	1PL5170
8A	0-CHGR-239-S ~~0 XSW 239 AC~~	206	Y 300	~~75~~ 70	Y 20	N/A	N/A	Y 600	Y CP250C5	300	1PL4932

R15 m.a. 4/13/92 J.I.H. 04-21-92

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R15 N.A. 9/13/92

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmg Date 1/22/90 Checked R.H. Bucket Date 1/26/90
R.H. Bucket 1/10/90 Scott Kelley 1/25/90

2-BD-212-A1

COMPT NO	SERVICE	BKR MODEL NO	SENSOR RATING	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
2C	2-MTR-30-104	DS-416	~~N~~ Y 200 ~~600A~~	~~90~~ 50	~~4~~ Y 8	N/A	N/A	~~4~~ Y 700	N/A	4/0	2PL5140
8A	CH'SR 0-XSW-239-2	DS-206	~~N~~ Y 200A	~~70~~ 75	~~4~~ Y 20	N/A	N/A	~~4~~ Y 600	~~N~~ Y CP6 CP350C5	2/12/90 2/12/90 300	2PL4931, PL341

R15 N.A. 4/13/92 J.I.H. 04-21-92

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~~WBN EEB-MS-TI15-0011 R0~~

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Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R. H. Buchart Date 1/22/90 Checked kmajmudar Date 1/26/90
kmajmudar 1/16/90 R. H. Buchart 1/21/90

2-BD-212-A2

COMPT NO	SERVICE	BKR MODEL NO	SENSOR RATING (A)	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
7B	2-MTR-30-274	DS-206	300	~~67~~ 65	~~12~~ 4	N/A	N/A	~~910~~ 700	SHAWMUT CP410 C5 Y	4/0	2PL5150
7C	0-MTR-30-136	DS-206	200 Y	~~75~~ 90	~~12~~ 4	N/A	N/A	~~1100~~ 700	SHAWMUT CP410 C5 Y	4/0	2PL5111

R15 m.n. 4/13/92 J.1.4 04-21-92

THIS SHEET ADDED BY REV 15

~~WBN EEB-MS-TI15-0011 R0~~

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmg/tmr/dar kmg/tmr Date 1/22/90 1/16/90 Checked R.H. Buchat R.H. Buchat Date 1/26/90 1/21/90

2-BD-212-B1

COMPT NO	SERVICE	BKR MODEL NO	SENSOR RATING (A)	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
2B	2-MTR-30-105	DS-416	~~300~~ 200	~~50~~ 90	~~8~~ 4	N/A	N/A	~~700~~	N/A	4/0	2PL5160
3B	2-MTR-62-101	DS-416	400	~~75~~ 80	~~20~~ 4	N/A	N/A	~~1000~~ 900	N/A	400	2PL5025

R15 W.A. 4/13/92 J.L.H. 04-21-92

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~~WBN EEB-MS-TI15-0011 R0~~

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Kmajmudar for Kmajmudar 1/16/90 2/5/90 Date 1/22/90 Checked R.H. Bucholt R.H. Bucholt R. Supkar Date 1/26/90 1/21/90 2/5/90

2-BD-212-B2

COMPT NO	SERVICE	BKR MODEL NO	SENSOR RATING (A)	LONG DELAY % OF PICKUP	LONG TIME (SEC)	SHORT DELAY % OF PICKUP	SHORT DELAY TIME (SEC)	INST % OF PICKUP	SECONDARY PROTECTIVE DEVICE	CABLE SIZE	CABLE NO
	2-CRN-271-R1									2/15/90 REB 2/15/90	
3B	~~2-PENT-293-H~~	DS-416	Y 300	100	Y ~~20~~ 4	N/A	N/A	Y 600	Y Gould CP6A-87 350	400 300	2PL4610 2PL4611
3D	0-BD-206-~~1A~~ A	"	Y 300	100	Y 20	Y 600 ~~400~~	0.18 ~~0.33~~	N/A	N/A	400	2PL4948
7A	2-MTR-30-278	DS-206	Y 300	65	Y 4 ~~12~~	N/A	N/A	700 ~~900~~	Y Gould CP 4/0 CS	4/0	2PL5170
7C	0-MTR-30-133	"	Y 200	90 ~~77.5~~	Y 4 ~~12~~	N/A	N/A	Y 700 ~~1100~~	Y Gould CP 4/0 CS	4/0	2PL5100

R15 m.n. 4/13/92 J.H. 04-21-92

THIS SHEET ADDED BY REV 15

~~EEB MS TI15-0011 R0~~

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Eng H. Buchat Date 1/22/90
R.H. Buchat 1/17/90
H.L. Bates 2/5/90

Checked Kmaylinder Date 1/26/90
Kmaylinder 1/25/90
R. Sundar 2-5-90

O-MCC-208-B

COMP NO	SERVICE	BKR TYPE	SET POS	TRIP RATING (A)	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION MFR	MODEL	RATING	CABLE SIZE	CABLE NO
		EF3-				G30					
2A	O-HST-271-HA	A025	3	Y125	1	T40 T40	←	N/A	→	10	PL1100 PL1101
2C	O-HST-271-HB	A025	3	Y125	1	T47 T40	←	N/A	→	10	PL1110 PL1111
2E1	O-HTR-271-ABUD	B030	N/A	Y30		N/A	←	N/A	→	8	PL1172
2F2	O-HST-271-AB15	B050	N/A	Y50		N/A	←	N/A	→	6	PL3840
3A	O-HST-271-HC	A025	3	Y125	1	T47 T40	←	N/A	→	10	PL1150 PL1151
3E1	O-HTR-271-ABUC	B030	N/A	Y30		N/A	←	N/A	→	8	PL1176
3F2	O-PO-208-B4	B070	N/A	Y70		N/A	←	N/A	→	2	PL3760
4A	O-MTR-61-120A	A010	HI	Y84	1	T28	←	N/A	→	10	PL1120
4B	O-MTR-61-112F	A003	HI	Y21	1	T18	←	N/A	→	12	PL1124
4F1	O-PKG-59-B	B040	N/A	Y40		N/A	←	N/A	→	6	PL3789
5A	1-MTR-87-26	A025	3	Y125	1	T39	←	N/A	→	10	
5E2	1-ACU-31-B	B050	N/A	Y50		N/A	←	N/A	→	6	PL3844
5F2	1-ACU-31-C	B100	N/A	Y100		N/A	←	N/A	→	2	PL3849
6A	2-MTR-77-262A	A025	LO	Y75	1	T38	←	N/A	→	10	PL3820
										6	
6E1	1-HTR-31-PASF	B020	N/A	Y20		N/A	←	N/A	→	14	IPL6813
6F2	1-ACU-31-IRS	B030	↓	Y30		↓	FUSE INFO. NOT AVAILABLE.		30A	8	IPL6794
7B	1-MTR-77-262A	A025	LO	Y75	1	T36	←	N/A	→	10	PL3947
7E1	1-HTR-271-AEE,AEN	B020	N/A	Y20		N/A	←	N/A	→	10	PL1189
7E2	O-HTR-271-ABUJ	B040		Y40			←	N/A	→	6	PL1204
7F1	2-HTR-271-AEB,AED	B030		Y30			←	N/A	→	8	PL1209
7F2	O-PO-208-B1,B2,B3	B100	↓	Y100			←	N/A	→	8	PL1210,11
8B	O-MTR-61-86	H050	2 HI	Y400 ~~670~~	3	T50	←	N/A	→	2	PL3780
8D	O-MTR-61-87	H050	2 HI	Y400 ~~670~~	3	T50	←	N/A	→	2	PL3789 PL3469
8F1	O-HTR-271-AEC,AE	B030	N/A	Y30		N/A	←	N/A	→	6	PL1129
8F2	O-HTR-271-AB/RR	B030	N/A	Y30		N/A	←	N/A	→	8	PL1132
9B	O-MTR-61-88	H050	3	Y475	3	T50	←	N/A	→	6	PL1184
9F2	1-MTR-271-AEJ	B030	N/A	Y30		N/A	←	N/A	→	8	PL1160
10A	2-MTR-31-318-B2	L050	3	Y260	2	T48	←	N/A	→	8	PL1135
										6	PL1180
										8	2PL6795

R15 w.n. 4/13/92 J.L.H. 04-21-92

SL-F647 04/84

Form GO-3.08.1 Rev. 2

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R15 M.A. 4/13/92 ~~3.2-94~~

~~WBN EEB-MS-TI15-0011 R0~~

Calculation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R. H. Buchert Date 1/22/90 Checked [illegible] Date 1/27/90
R. H. Buchert 1/17/90 Scott Kelley 1/25/90

O-MCC-208-C

COMPT NO	SERVICE	BKR TYPE EF3-	SET POS	TRIP RATING (A)	STR SIZE	OL HTR CAT# G30	SECONDARY PROTECTION MFR	MODEL	RATING	CABLE SIZE	CABLE NO
10A	2-MTR-31-318/B2	L050	3	Y 260		T48	← N/A →			8	2PL6795
10B	2-MTR-31-318/A2	A010	4	Y 58		T34	← N/A →			12	2PL6780
10C	0-MTR-257-1	A003	3	Y 12		T19	← N/A →			12	PL3925
10E	2-MTR-31-437/C2	A003Z	HI	Y 21		T22	← N/A →			12	2PL6800
11C	0-HTR-31-479	B050	N/A	Y 50		N/A	← N/A →			6	PL6001
6F2	0-CHGR-236-5	B100	N/A	Y 100	N/A	N/A	N/A	N/A	N/A	2	PL3900
9A	SPARE ~~2-MTR-87-26~~	A025Z	HI	N 210		T40	← N/A →			10	ABN2023

R15 (REF. 3.25) M.A. 4/13/92 J.I.H. 04-21-92

ASW744-6

Form GO-3.08.1 Rev. 2 SL-F647 04/84

THIS SHEET ADDED BY REV. 15

~~WBN EEB-MS-TI15-0011 R0~~

~~Page H26 of H72~~

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchert Date 1/22/90 Checked Engineer Date 1/27/90
R.H. Buchert 1/10/90 Brad Kelley 1/25/90

O-MCC-215-C2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING (A)	STR SIZE	DL HTR CAT # G30	SECONDARY PROTECTION MFR	MODEL	RATING	CABLE SIZE	CABLE NO	
		GE TED										
BN-	O-HTR-30-~~32~~ 321	136YT 150	N/A.	150	N/A	N/A	1	A4J15	Y 15A	12	PL3274	
BR-	O-HTR-30-~~315~~ 319	136YT 150	N/A	150	N/A	N/A.	1	A4J15	Y 15A	12	PL3272	R15 w.n. 4/21/92 J.I.H. 04-21-92
CA-	O-MTR-30-329	136YT 150	N/A	150	1	C0.97A	1	TRS ~~1R~~ 1.6R	Y ~~1A~~ 1.6A	12X2	PL3308	
CN-	O-HTR-30-317	136YT 150	N/A	150	N/A	N/A.	1	A4J30	Y 30A	8	PL3270	
CR	O-HTR-30-322	136YT 150	N/A	150	N/A	N/A	1	A4J30	Y 30A	8	PL3275	
CU	O-HTR-30-325	136YT 150	N/A	150	N/A	N/A.	1	A4J15	Y 15A	12	PL3278	
CX	O-HTR-30-324	136YT 150	N/A	150	N/A	N/A.	1	A4J15	Y 15A	12	PL3277	
DR	O-MTR-82-320	N/A	N/A	N/A	1	C8.67A	1	TRS ~~9R~~ 12R PRIM. PROT.	Y ~~9A~~ 12A	12	PL3269	
DU	O-MTR-82-321	N/A	N/A	N/A	1	C8.67A	1	TRS ~~9R~~ 12R PRIM. PROT.	Y ~~9A~~ 12A	12	PL3268	
EA	O-SW-30-327	N/A	N/A	N/A	1	C148A	1	TRS ~~6/10~~ 3R PRIM. PROT.	Y ~~1.6A~~ 3A	12	PL3316	R15 w.n. 4/21/92 J.I.H. 04-21-92
EE	O-HTR-82-C-S ~~O-TB-82-CAS~~	N/A	N/A	N/A	1	C695A	1	TRS 10R PRIM. PROT.	Y 10A	12	PL3267	
FS	O-PO-215-12	136YT 150	N/A	150	N/A	N/A	1	A4J ~~40~~ 60	Y ~~10A~~ 60A	4	PL3286	
FW	O-PO-215-13	136YT 150	N/A	150	N/A	N/A	1	A4J60	Y 60A	4	PL3287	
GA	O-HTR-30-318	136YT 150	N/A	150	N/A	N/A	1	A4J15	Y 15A	12	PL3271	
GD	O-HTR 30-320	136YT 150	N/A	150	N/A	N/A	1	A4J15	Y 15A	12	PL3273	
GG	O-HTR-30-323	136YT 150	N/A	150	N/A	N/A	1	A4J15	Y 15A	12	PL3276	

THIS SHEET ADDED BY REV 15

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Burchett Date 1/22/90
R.H. Burchett 1/10/90
M.Bates 2/5/90

Checked Engineer Date 1/27/90
Dwg Kelley 1/25/90
R Swpkar 2-5-90

O-MCC-215-C2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	DL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
	O-PO-215-B-11	GE TED		(A)		G30	MFR	MODEL	RATING		
GK	~~O-FB-287-4784~~	136Y T150	N/A	150	N/A	N/A	1	A4J90	Y 90A	2	PL3280
										2	PL3281 thru PL3285
GR	O-HTR-30-326	136Y T150	N/A	150	N/A	N/A	1	A4J~~20~~ 15	Y ~~20A~~ 15A	12	PL3279

R15 m.A. 4/13/92 J.I.H. 04-21-92

Form GO-3.08.1 Rev. 2 SL-F647 04/84

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~~WBN EEB MS TI15 0011 R0~~

~~Page H36 of H72~~

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R. H. Buchat Date 1/22/90 Checked [signature] Date 1/26/90
[signature] 1/16/90 R. H. Buchat 1/25/90
[signature] 2/5/90 R. Siupkar 2/5/90

1-MCC-213-A1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING (A)	STR SIZE	OL HTR CAT # G30	SECONDARY PROTECTION MFR	MODEL	RATING	CABLE SIZE	CABLE NO
	1-MTR-31-265	EF3-									
16A	~~1-PENT-293-32~~	A010	~~4 B~~	Y ~~45~~ 58	1	~~T32~~ T33	SHAW-MUT	TRS-30	Y 30A	10	1PL6300
				Y					N	12	1PL6301
16B	1-MTR-77-129 ~~1-PENT-293-24~~	A010	2 ~~C~~	Y ~~27~~ 36	1	T27	SHAW-MUT	TRS-30	Y 30A	10	1PL6268
				Y					N	12	1PL6269
16F1	0-CHGR-252-1 ~~0-XSW-252-1~~	ED63 B030 ~~B020~~	N/A	Y ~~20~~ 30	N/A	N/A	N/A	N/A	N/A	10	1PL6040
16F2	1-MTR-31-303/2 ~~1-TB-31-303/2~~	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10X2	1PL6289
17A	1-HTR-62-228/2 ~~0-JB-292-2051~~	B040 ~~B030~~	N/A	Y 30	2	N/A	N/A	N/A	N/A	8	1PL6208
										12	1PL6209
										12	1PL6210
17E	1-PO-213-A1/1-5 ~~1-PENT-293-32~~	B100	N/A	Y 100	N/A	N/A	SHAW-MUT	CPGA-197 #2	N/A Y JHH 2/15/90 REQ 2/15/90	2	1PL6100
										2	1PL6094
17F1	CHGR 0-~~XSW~~-240-S	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	1PL6060
18C	1-MTR-31-303/1	A010	4 B	Y ~~45~~ 58	1	~~T32~~ T33	←	N/A	→	12	1PL6281
18D	0-MTR-62-226	A005	4 B	Y ~~22~~ 29	1	T26	←	N/A	→	12	1PL6265
18F1	CHGR 0-~~XSW~~-250-1	B020	N/A	Y 20	<	----	N/A	----	-->	10	PL871
18F2	1-PO-213-A1/6-10 ~~1-JB-293-2859~~	B100 ~~A100~~	LO	Y 475	←	----	N/A	----	→	2X2	1PL6093
										2	1PL6101
										2	1PL6102
										2	1PL6103
										2	1PL6104
										2	1PL6106

R15 n.a. 4/4/92 J.I.H. 04-21-92

Form GO-3.08.1 Rev. 2 SL-F647 04/84

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R15 m.n. 4/13/92

~~N EEB-MS-TI15-0011 R0~~

Calculation of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmg 1/22/90 Date 1/22/90 Checked R.H. Bucket Date 1/24/90
kmg 1/16/90 R.H. Bucket 1/25/90

1-MCC-213-A2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
4A	1-FCV-3-191	A010	~~4B~~	~~Y45~~ 58	1	~~T32~~ T28	←	N/A	→	12	1V3260
4B	1-FCV-3-192	A010	~~4B~~	~~Y45~~ 58	1	~~T32~~ T28	←	N/A	→	12	1V3280

R15 m.n. 4/13/92 J.I.H. 04-21-92

Form GO-3.08.1 Rev. 2 SL-F647 04/84

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Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchert Date 1/22/90 Checked Kmaghrdar Date 1/26/90
R.H. Buchert 1/10/90 Doug Kelley 1/25/90

1-MCC-213-B1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
3F1	0-CHGR-252-2 ~~0-XSW-252-2~~	ED63-B0~~20~~ 30	N/A	Y ~~30~~	←		N/A		→	10	1PL6045
16A	1-MTR-31-266 ~~1-PENT-293-35~~	A010	4 ~~3~~	Y ~~58~~ ~~45~~	1	T33 ~~T32~~	1	TRS 30	Y 30A N	10 12	1PL6310 1PL6311
16E	1-PO-213-B1/1-5 ~~1PENT-293-47~~	B100	N/A	Y 100	N/A	N/A	1	CP6A-197 #2	N Y 2/15/90	2 2	1PL6085 1PL6082
16F1	CHGR 0-~~XSW~~-240-5	B020	N/A	Y 20	←	N/A			→	10	1PL6061
17A	1-HTR-62-228/1 ~~0-JB-292-2048~~	B040	N/A	Y 40 ~~N/A~~ ~~N/A~~	2	←	N/A		→	8 12 12	1PL6214 1PL6215 1PL6216
17E	1-PO-213-B1/6-10 ~~1PENT-293-35~~	B100	N/A	Y 100	N/A	N/A	1	CP6A-197 #2	N Y 2/15/90	2x2 2	1PL6075 1PL6076
17F1	CHGR 0-~~XSW~~-240-1	ED63-B020	N/A	Y 20	←		N/A		→	10	PL876
17F2	MTR 1-~~TB~~-31-324/2	ED63-B020	N/A	Y 20	←		N/A		→	10	1PL6291
18C	1-MTR-31-324/1	A010	4 ~~3~~	Y ~~58~~ ~~45~~	1	T33 ~~T32~~	←	N/A	→	10	1PL6285
18D	0-MTR-84-2	A005	4 ~~3~~	Y ~~29~~ ~~22~~	1	T26	←	N/A	→	12	1PL6273

R15 mod. 4/14/92 04-21-92 J.L.H.

THIS SHEET ADDED BY REV 15

TVA 3-7-96 | R15 m.n. 4/13/92

~~WBN EEB-MS-TI15-0011 R0~~

Calculation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Burchart Date 1/22/90 Checked [illegible] Date 1/26/90
~~R.H. Burchart~~ 1/10/90 ~~[illegible]~~ 1/21/90

1-MCC-213-B2

COMPT NO	SERVICE	BKR TYPE EF3-	SET POS	TRIP RATING (A)	STR SIZE	OL HTR CAT # G30	SECONDARY PROTECTION MFR	MODEL	RATING	CABLE SIZE	CABLE NO
4A	1-FCV-3-193	A010 ~~A010B~~	~~3~~ 4	~~45~~ 58	1	~~T32~~ T28	←	N/A	→	12	1V3290
4B	1-FCV-3-194	A010 ~~A010B~~	~~3~~ 4	~~45~~ 58	1	~~T32~~ T28	←	N/A	→	12X2	1V3270
12A	0-FCV-67-362	~~B010~~ A	~~10~~ 2	~~27~~ 36	1	~~T28~~ T29	←	N/A	→	12	1V3230

R15 m.n. 4/13/92 J.I.H. 04-21-92

THIS SHEET ADDED BY REV 15

Calculation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Jmajmudar Date 1/22/90 Checked R.H. Bucket Date 1/26/90
R.H. Bucket 1/10/90 Scott Kelley 1/25/90

1-MCC-214-A1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING (A)	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION MFR	SECONDARY PROTECTION MODEL	SECONDARY PROTECTION RATING	CABLE SIZE	CABLE NO	
		EF3-				G30						
2D	1-MTR-81-3	HOSO	~~3~~ 2	Y ~~400~~ 475	3	T52	N/A	N/A	N/A	6	1PL3221	R15 m.a. 4/13/92 J.L.H. 04-21-92
2F1	0-DXF-234-A1/SIS	B020	N/A	Y 20	N/A	N/A	GOULD/SHAWMUT	D15A030 *	Y 30A	8	1PL3590	
2F2	1-DXF-242-1	FXD63-B125 ~~3070~~	~~N/A~~ 5	N ~~70~~ 1200	N/A	N/A	GOULD/SHAWMUT	D15A8100 *	N 100A	4	1PL3596	R15 m.a. 4/13/92 J.L.H. 04-21-92
3F1	1-RE-90-119	B020	N/A	Y 20	N/A	N/A	GOULD/SHAWMUT	D15A030 *	N 30A	10	1PL3589	
3F2	~~SPARE 1-MTR-40-3A 0-TB-40-3~~	B020	N/A	Y 20	N/A	N/A	GOULD/SHAWMUT	D15A030 *	N 30A	10	1PL3720 ~~1PL3716~~ 2-5490	(REF 3.14) R15 m.a. 4/13/92 J.L.H. 04-21-92
5F1	0-RE-90-132	B020	N/A	Y 20	N/A	N/A	GOULD/SHAWMUT	D15A030 *	N 30A	10	1PL3599	
10F1	0-RE-90-101	B020	N/A	Y 20	N/A	N/A	GOULD/SHAWMUT	D15A030 *	N 30A	10	1PL3598	
12E1	1-PNL-90-L398	B020	N/A	Y 20	N/A	N/A	GOULD/SHAWMUT	D15A030 *	N 30A	10	1PL3610	
13A	1-MTR-84-16	A005	~~4~~ 3	Y ~~22~~ 29	1	T25	← N/A →			12	1PL2940	R15 m.a. 4/13/92 J.L.H. 04-21-92
13B	0-MTR-84-6	A005	3	Y 22	1	T25	← N/A →			12	1PL3460	
13C	1-MTR-65-77	A025	~~2~~ 1	Y ~~75~~ 105	1	~~T37~~ T38	← N/A →			12	1PL3645	R15 m.a. 4/13/92 J.L.H. 04-21-92

Shamut D15A & HFCP are the same fuse.

Form GO-3.08.1 Rev. 2 SL-F647 04/84

THIS SHEET ADDED BY REV 15

R15 m.a. 4/13/92

~~WBN EEB MS TI15 0011 R0~~

lation of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmaylander Date 1/22/90 Checked R. H. Buchert Date 1/26/90
kmaylander 1/16/90 R. H. Buchert 1/25/90
GBates 2/5/90 R. Slupkar 2-5-90

1-MCC-214-A2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2A	0-MTR-31-339	A003 ~~5~~	~~4~~ ~~8~~	Y ~~29~~ ~~17~~	1	T20	←	N/A	→	12	IPL2830 R15 m.a. 4/13/92
2D1	1-HTR-30-A1A	B020	N/A	Y 20	N/A	N/A	1	DISA030	N 30A	10	IPL3280
2D2	0-PO-214-1-4	B100	N/A	Y 100	N/A	N/A	1	D15AB100	Y 100A	2	IPL2780 R15 m.a. 4/13/92
2E1	1-HTR-30-B1A	B020	N/A	Y 20	N/A	N/A	1	DISA030	N 30A	10	IPL3284
2E2	0-HTR-31-493 ~~0-TB-31-493/1~~	B050Z	N/A	Y 50 N	N/A	N/A	1	DISA050	Y 50A N	6 10	IPL6460 IPL6463,64
2F2	0-PO-214-7,8	B100	N/A	Y 100	N/A	N/A	1	DISAB100	Y 100A	2	IPL2777 R15 m.a. 4/13/92
3A	1-MTR-30-25	A010	4 ~~3~~	Y ~~58~~ ~~45~~	1	T34 ~~T32~~	←	N/A	→	12x2	IPL2906
3D1	1-HTR-30-ACRD	B020	N/A	Y 20	N/A	N/A	1	DISA030	N 30A	10	IPL3266
3D2	0-PO-214-5,6	B100	N/A	Y 100	N/A	N/A	1	D15AB100	Y 100A	2	IPL2775 R15 m.a. 4/13/92
3E1	1-HTR-30-C1A	B020	N/A	Y 20	N/A	N/A	1	DISA030	N 30A	10	IPL3288
3E2	1-HTR-~~30~~ 31-D1A	B050Z	N/A	Y 50	N/A	N/A	1	DISA050	Y 50A	6	IPL3510 R15 m.a. 4/13/92
3F1	0-HTR-31-97	B020	N/A	Y 20	N/A	N/A	1	DISA030	N 30A	10	IPL2800
3F2	1-HTR-30-1A1	B020	N/A	Y 20	N/A	N/A	1	DISA030	N 30A	10	IPL3365
4A	1-MTR-30-283	A005	4 ~~2~~	Y ~~29~~ ~~18~~	1	T24	←	N/A	→	12	IPL3621 R15 m.a. 4/13/92
4B	0-MTR-31-203 /204	A025	3	Y 25	1	T41 ~~T44~~	←	N/A	→	10	V1920
4E1	1-HTR-30-BCRD	B020	N/A	Y 20	N/A	N/A	1	DISA030	N 30A.	10	IPL3264

R15 J.LH. 04-21-92

THIS SHEET ADDED BY REV. 15

~~WBN EEB-MS-TI15-0011 R0~~

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lation of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmyhrudar Date 1/22/90 Checked R.H. Bucholt Date 1/26/90
kmyhrudar 1/16/90 R.H. Bucholt 1/25/90

1-MCC-214-A2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	DL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
4F1	1-HTR-30-CCRD	B020	N/A	Y 20	N/A	N/A	1	DISA030	N 30A	10	IPL3268
5A	1-MTR-30-301	A010	~~3~~ 4	Y ~~45~~ 58	1	T34	←	N/A	→	12	IPL3435
5E1	0-HTR-31-83	B030	N/A	Y 30	N/A	N/A.	1	DISA030	Y 30A	8	IPL3707
5F1	1-HTR-30-XM1A	B020	N/A	Y 20	N/A	N/A.	1	DISA030	N 30A	10	IPL3370
5F2	1-HTR-30-AB1	B020	N/A	Y 20	N/A	N/A	1	DISA030	N 30A	10	IPL3314
6E1	1-HTR-30-SMS	B030	N/A	Y 30	N/A	N/A.	1	DISA030	Y 30A	8	IPL2811
6E2	1-HTR-30-NM1	B050	N/A	Y 50	N/A	N/A.	1	DISA050	Y 50A	6	IPL2806
6F2	0-HTR-30-RM1	B020	N/A	Y 20	N/A	N/A	1	DISA030	N 30A	10	IPL3320
7D2	0-HTR-30-AFH	B040	N/A	Y 40	N/A	N/A	1	DISA050	Y 50A	6	IPL3335
7E1	1-HTR-30-U1A	B020	N/A	Y 20	N/A	N/A.	1	DISA030	N 30A	10	IPL2813
7E2	0-HTR-30-BFH	B040	N/A	Y 40	N/A	N/A	1	DISA050	Y 50A	6	IPL3330
7F2	0-HTR-30-CFH	B040	N/A	Y 40	N/A	N/A.	1	DISA050	Y 50A	6	IPL3340
8A	1-MTR-30-CRD	~~FXD63 F33~~ B125	LO ~~Hi~~	Y 800 ~~1600~~	N/A	N/A	←	N/A	→	2/0	IPL3692
8B	1-HTR-1-CBS	FXD63 ~~F33~~ B125	LO ~~H~~	Y 800 ~~1500~~	N/A	N/A	←	N/A	→	4/0	IPL3680

R15 rev. 4/13/92 J.I.H. 04-21-92

R15 rev. 4/13/92 J.I.H. 04-21-92

Form GO-3.08.1 Rev.2 SL-F647 04/84

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R15 m.a. 4/13/92

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Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared ~~Kmajmudar~~ Date 1/22/90 Checked ~~R.A. Buchart~~ Date 1/26/90
R. H. Buchart 1/10/90 Doug Kelley 1/25/90

1-MCC-214-B1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING (A)	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION MFR	SECONDARY PROTECTION MODEL	SECONDARY PROTECTION RATING	CABLE SIZE	CABLE NO	
		EF3-				G30						
2D	1-MTR-81-7	H050	~~3~~ Y	~~Y 475~~ ~~400~~	3	T52	←	N/A	→	6	1PL3228	
2F1	0-DXF-234-B1/SIS	B020	N/A	Y20	N/A	N/A	1	DISA030	Y 30A	8	1PL3740	(REF 3.6)
2F2	SPARE ~~1-MTR-40-66A~~ ~~0-TB-40-66~~	B020	N/A	Y20	N/A	N/A	1	DISA030	N 30A	10	1PL3730	R15 m.a. 4/13/92 J.I.H. 04-21-92
9F1	1-XFMR-290-236 ~~1-PNL-55-L236~~	B020	N/A	Y20	N/A	N/A	1	DISA030	N 30A	10	1PL2972	
12A	1-MTR-30-181	A010	~~4~~ 3	~~Y 58~~ ~~45~~	1	T33	←	N/A	→	10	1PL3021	
12E1	0-PNL-90-L397	B020	N/A	Y20	N/A	N/A	1	DISA030	N 30A	10	1PL3609	
12F1	1-RE-90-99	B020	N/A	Y20	N/A	N/A	1	DISA030	N 30A	10	1PL3790	
13A	1-MTR-84-21	A005	~~4~~ 3	~~Y 29~~ ~~22~~	1	T25 ~~T23~~	←	N/A	→	12	1PL2948	
13B	0-MTR-84-11	A005	3	Y22	1	T25 ~~T24~~	←	N/A	→	12	1PL3465	R15 m.a. 4/13/92
13C	1-MTR-65-74	A025	~~2~~ ~~CO~~	~~Y105~~ ~~45~~	1	T38 ~~T37~~	←	N/A	→	12	1PL3660	(REF 3.6) J.I.H. 04-21-92
13F1	SPARE ~~0DXF234 B4/CYCS~~ ~~0-DXF-234-B4~~	B020	N/A	Y20	N/A	N/A	1	DISA030	N 30A	10	1PL3017	

THIS SHEET ADDED BY REV. 15

lation of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmaghrudar Date 1/22/90 Checked R.H. Bruchart Date 1/26/90
R.H. Bruchart 1/10/90 Deon N Kelley 1/25/90

1-MCC-214-B2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO	
		EF3-		(A)		G30	MFR	MODEL	RATING			
2B	0-MTR-31-418	A005	~~3~~ 4	Y ~~22~~ 29	1	~~T18~~ T28	← N/A →			12	1PL3654	R15 m.a. 4/13/92
2E1	1-HTR-30-AIB	B020	N/A	Y 20	N/A	N/A	1	N DISA030	30A.	10	1PL3676	
2E2	0-HTR-30-GFA	B040	N/A	Y 40	N/A	N/A	1	Y DISA050	50A.	6	1PL3400	
2F1	1-HTR-30-BIB	B020	N/A	Y 20	N/A	N/A	1	N DISA030	30A	10	1PL3898	
2F2	1-HTR-31-BRB	B050	N/A	Y 50	N/A	N/A	1	Y DISA050	50A	6	1PL3890	
3B	1-MTR-30-284	A005	4 ~~2~~	Y ~~29~~ 18	1	T24	← N/A →			12	1PL3626	R15 m.a. 4/13/92
3C	1-MTR-30-66	A005	4 ~~2~~	Y ~~29~~ 18	1	T24	← N/A →			12	1PL3631	
3E1	1-HTR-30-CIB	B020	N/A	Y 20	N/A	N/A	1	N D15A030	30A.	10	1PL3895	
3E2	0-HTR-30-HFA	B040	N/A	Y 40	N/A	N/A	1	Y D15A050	50A	6	1PL3405	
3F1	1-HTR-30-PRX	B020	N/A	Y 20	N/A	N/A	1	N D15A030	30A.	10	1PL3395	
4B	1-MTR-30-302	A010	4 ~~2~~	Y ~~58~~ 45	1	~~T33~~ T32	← N/A →			12	1PL3438	R15 m.a. 4/13/92
4E1	0-HTR-31-95	B020	N/A	Y 20	N/A	N/A	1	N D15A030	30A	10	1PL2809	
4E2	0-HTR-30-NFA	B040	N/A	Y 40	N/A	N/A	1	Y D15A050	50A	6	1PL3415	
4F1	1-HTR-30-SBU	B020	N/A	Y 20	N/A	N/A	1	N D15A030	30A	10	1PL3425	
4F2	1-HTR-30-U113	B020	N/A	Y 20	N/A	N/A	1	N D15A030	30A	10	1PL2975	
5E1	1-HTR-31-87	B020	N/A	Y 20	N/A	N/A	1	N D15A030	30A	10	1PL2825	

R15 J.J.H. 04-21-92

THIS SHEET ADDED BY REV. 15

~~Page 174 of 201~~ ~~APPENDIX H 173 of 200~~ 2/5/90 R15 Tom 3 3-7-91

~~WBN EEB MS TI15 0011 R0~~ ~~Page 1145 of 1172~~

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Tom Snyder Date 1/22/90 Checked R. H. Buchert Date 1/26/90
R. H. Buchert 1/17/90 Brad Holley 1/25/90
GL Bate 2/5/90 R Sripkar 2-5-90

1-MCC-214-B2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO	
		EF3-		(A)		630	MFR	MODEL	RATING			
5F1	0-HTR-30-RM2	B020	N/A	Y 20	N/A	N/A	1	D15A030	N 30A	10	IPL3385	
6B	1-MTR-30-26	A010	~~3~~ 4	Y ~~45~~ 58	1	~~T32~~ T33	← N/A →			12	IPL2913	R15 m.a. 4/21/92 J.I.H. 04-21-92
6E1	1-HTR-30-AB7	B020	N/A	Y 20	N/A	N/A	1	D15A030	N 30A	10	IPL3381	
6F1	1-HTR-30-T1B	B020	N/A	Y 20	N/A	N/A	1	D15A030	N 30A	10	IPL3430	
7D	0-HTR-31-421	~~F33~~ FXD63 B225	~~HI~~ 3	Y ~~2000~~ 1500	N/A	N/A	← N/A →			300	IPL3440	R15 m.a. 4/21/92 J.I.H. 04-21-92
7E2	0-HTR-31-72	EF3- B030	N/A	Y 30	N/A	N/A	1	D15A030	Y 30A	8	IPL2977	
7F1	1-HTR-30-NM2	B050Z	N/A	Y 50	N/A	N/A	1	D15A050	Y 50A	6	IPL3421	
8F1	0-~~TS~~ HTR-31-494	~~B040~~ 50 B030	N/A	~~Y 40~~ Y 50	N/A	N/A	1	D15A050	Y 50A N Y	6 10 10	IPL6470 IPL6473 IPL6474	
8F2	1-P0-214-10-12	B100	N/A	Y 100	N/A	N/A	1	D15AB100	Y 100A	2	IPL2785	R15 m.a. 4/21/92 J.I.H. 04-21-92
9A	1-MTR-30-CRB	~~F33~~ FXD63 B125	LO	~~Y 750~~ Y 800	N/A	N/A	← N/A →			4/0	IPL3671	

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~~ulation~~ of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmajmudar kmajmudar Date 1/22/90 1/16/90 Checked R.H. Buchart R.H. Buchart Date 1/26/90 1/25/90

1-MCC-215-A1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
5A	1-MTR-82-181	A025	~~2~~ ~~LO~~	Y 105 ~~75~~	1	T39 ~~T30~~	←	N/A	→	12	PL2195
5F1	0-HTR-30-479	B020	N/A	Y 20	←		N/A		→	10	PL2322
5F2	1-PO-215-1,2,3 ~~+JB-296-256~~	B100	N/A	Y 100	←		N/A		→	2	PL2539
6A	MTR 1-~~SW~~-30-463	A005	HI ~~2~~	Y 41 ~~+8~~	1	T28 ~~T25~~	←	N/A	→	12	PL2235
6F1	0-HTR-30-483	B020	N/A	Y 20	←		N/A		→	10	PL2310

R15 m.w. 4/13/92 J.I.H. 04-21-92

R15 m.w. 4/13/92 J.I.H. 04-21-92

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THIS SHEET ADDED BY REV 15

R15 M.R. 4/13/92

~~N EEB MS TI15 0011 R0~~

~~bulation~~ of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmgbucker Date 1/22/90 1/16/90 Checked R.H. Buchart Date 1/26/90 R. H. Buchart 1/25/90

1-MCC-215-A2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO	
		EF3-		(A)		G30	MFR	MODEL	RATING			
2E2	0-HTR-30-484	B040	N/A	Y 40	←		N/A	→		6	PL2304	
3E1	1-HTR-30-487	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	PL2411	
3F1	1-HTR-30-471	B030	N/A	Y 30	N/A	N/A	N/A	N/A	N/A	8	PL2262	
3F2	1-HTR-30-472	B030	N/A	Y 30	N/A	N/A	N/A	N/A	N/A	8	PL2268	
5A	1-MTR-82-180	A025Z	~~LO~~ 2	Y ~~75~~ 105	1	~~T38~~ T39	N/A	N/A	N/A	12	PL2200	R15 M.R. 4/13/92 J.I.H. 04-21-92
5E1	0-HTR-30-485	B030	N/A	Y 30	N/A	N/A	N/A	N/A	N/A	8	PL2316	
5F1	PKG 0-~~SW~~-39-37	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	PL2765	
6A	0-MTR-30-470	A005	4	Y 29	1	~~T25~~ T22	N/A	N/A	N/A	12	PL2572	R15 M.R. 4/13/92 J.I.H. 04-21-92
6D	~~1-TR-82-A/1-A~~ 1-HTR-82-100	B020	N/A	Y 20	N/A X per 4/17/92	N/A	N/A	N/A	N/A	12	PL2700	
~~2E2~~	~~0-HTR-30-484~~	~~B040~~	~~N/A~~	~~Y 40~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~6~~	~~PL2304~~	

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THIS SHEET ADDED BY REV 15

~~WBN EEB-MS-TI15-0011 R9~~ ~~Page H48 of H72~~

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Kim Lyndon Date 1/22/90 Checked R.H. Bucheit Date 1/24/90
R.H. Bucheit 1/17/90 Kim Lyndon 1/25/90

1-MCC-215-B1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO	
		EF3-		(A)		G30	MFR	MODEL	RATING			
5A	1-MTR-82-211	A025Z	~~LO~~ 2	Y ~~75~~ 105	1	~~N/A~~ T39	N/A	N/A	N/A	12	PL2215	R15 m.a. 4/13/92 J.L.H. 04-21-92
5F1	0-HTR-30-481	B020	N/A	Y 20	NA	N/A	N/A	N/A	N/A	10	PL2340	
6A	MTR 1-SW-30-465	A005	~~2~~ HI	~~16~~ 41	1	~~T26~~ T28	N/A	N/A	N/A	12	PL2249	R15 m.a. 4/13/92 J.L.H. 04-21-92

THIS SHEET ADDED BY REV 15

~~WBN EEB-MS-TI15-0011 R0~~

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared kaglunder Date 1/22/90 Checked R.H. Buchart Date 1/26/90
R. H. Buchart 1/17/90 kaglunder 1/25/90

1-MCC-215-B2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
3E1	1-HTR-30-489	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	PL2412
3F1	1-HTR-30-473	B030	N/A	Y 30	N/A	N/A	N/A	N/A	N/A	8	PL2274
3F2	1-HTR-30-474	B030	N/A	Y 30	N/A	N/A	N/A	N/A	N/A	8	PL2280
5A	1-MTR-82-210	A025Z	~~L0~~ 2	Y ~~75~~ 105	1	~~T38~~ T39	N/A	N/A	N/A	12	PL2220
5F2	1-PO-215-4,5,6 ~~1-JB-296-258~~	B100	N/A	Y 100	N/A	N/A	N/A	N/A	N/A	2	PL2552 R15 m.e. 4/21/92 J.L.H. 04-21-92
6D	1-HTR-82-200 ~~1-JB-82-B/1-B~~	B020	N/A	Y 20	N/A X	N/A	N/A	N/A	N/A	12	PL2706

Form GO-3.08.1 Rev. 2 SL-F647 04/84

THIS SHEET ADDED BY REV 15

TMS 3-2-92 | R15 m-A-4/13/92

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared KM by GJB Date 1/22/90
KM by GJB 1/16/90
GJ Bates 2/5/90

Checked JBT FOR RHB Date 1-26-90
JBT FOR RAB 1-25-90
R. Supkar 2-5-90

1-MCC-232-A

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING (A)	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION MFR	SECONDARY PROTECTION MODEL	SECONDARY PROTECTION RATING	CABLE SIZE	CABLE NO
		EF3-				G30					
2A	~~1-MTR-77-125A~~ ~~1-PENT-293-24~~	A010	~~4~~	~~Y 45~~ Y 58 Y	1	T35	SHAW-MUT	TRS-30	Y 30 N	10X2 12	IPL653 IPL654
3A	1-MTR-94-1D ~~1-PENT-293-32 FLUX D~~	B020	N/A	Y 20	N/A	N/A	"	DISAD30	N 30	10X2 10	IPL295 IPL296
3B	1-MTR-94-1E ~~1-PENT-293-32 FLUX E~~	B020	N/A	Y 20	N/A	N/A	"	DISA030	N 30	10X2 10	IPL300 IPL301
3C	1-MTR-94-1F ~~1-PENT-293-32 FLUX F~~	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10X2 10	IPL305 IPL306
4D	1-MTR-61-51	L050	HI ~~4~~	N 470 ~~330~~	2	T51	N/A	N/A	N/A	8	IPL4320
4E	1-HTR-61-92	B050	N/A	Y 50	2	T54 ~~T51~~	N/A	N/A	N/A	6	IPL4300
5A	0-MTR-31-406	A005	~~3~~ ~~4~~	Y ~~29~~ 22	1	T18 ~~T28~~	N/A	N/A	N/A	12	IPL644
6A	0-MTR-31-25	A010	4	Y 58	1	T34	N/A	N/A	N/A	12	IPL735
6C	0-MTR-77-91	H050	~~LO~~ 2	Y ~~320~~ 400	2	T53 ~~T52~~	N/A	N/A	N/A	6X2	IPL5460
6F1	DXF 0-SW-234-A/IPS	~~B030~~ B040	N/A	Y ~~30~~ 40	N/A	N/A	SHAW-MUT	DISA030	Y 30	1/0	IPL1108
7B	1-HTR-68-8AA ~~1-PENT-293-32 RCP 1 HTR~~	A010	~~LO~~ 2	Y ~~36~~ 27	1	T31 ~~T36~~	"	TRS-30	N 30	12 12	IPL370 IPL371
7D	1-MTR-68-84 ~~1-PENT-293-32 RCP 1 LIFT~~	B040	N/A	Y 40	1	T45 ~~T44~~	"	"	Y 30	10 10	IPL396 IPL397
7F2	1-PO-232-9-11 ~~1-JB-292-994~~	B100	N/A	Y 100	N/A	N/A	SHAW-MUT	DISAB100	Y 100	2	IPL258
8B	1-HTR-68-50AA ~~1-PENT-293-24 RCP 3 HTR~~	A010	~~LO~~ 2	Y ~~36~~ 27	1	T31 ~~T36~~	"	TRS-30	N 30	12X2 12	IPL382 IPL383
8D	1-MTR-68-86 ~~1-PENT-293-24 RCP 3 LIFT~~	~~A025~~ B040	3	Y 125	1	T45	"	"	Y 30	10X2 10	IPL408 IPL409
8F2	1-PO-232-1,2,3 ~~1-JB-292-993~~	B100	N/A	Y 100	N/A	N/A	SHAW-MUT	DISAB100	Y 100	2	IPL240 241,243

R15 m-A-4/13/92 J.I.H. 04-21-92

R15 m-A-4/13/92 J.I.H. 04/21/92

THIS SHEET ADDED BY REV 15

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Bucknet Date 1/22/90 Checked Engineer Date 1/26/90
Engineer 1/16/90 R. H. Bucknet 1/25/90
R. Bates 2/5/90 R. Supkaw 2/5/90

1-MCC-232-A

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
9B	1-MTR-30-95 ~~1-PENT 293-32 FAN A~~	A025	LO	Y 75 Y	1	T40	SHAW-MUT	TRS-30	Y 30 N	10x2 12	1PL520 1PL521
9F2	1-PO-232-5-B ~~1-JB-292-1869~~	B100	N/A	Y 100	N/A	N/A	SHAW-MUT	DISAB100	Y 100	2	1PL250, 251→253
10B	1-MTR-30-99 ~~1-PENT 293-24 FAN G~~	A025	LO ~~Z~~	Y ~~105~~ 75 Y	1	T40	"	TRS-30	Y 30 N	10X2 12	1PL550 1PL551
10F	1-HST-78-ST1,2,3 ~~1-PENT 293-32 STU~~	B020	N/A	Y 20 Y	N/A	N/A	"	DISA030	N 30 N	10 12	1PL270 1PL271
11D	1-PENT-293-24 RCDT A	B030	N/A	Y 30	2	T45	"	TRS-60	Y 60	8 8	1PL485 1PL486
11F	1-HTR-30-74H ~~1-PENT 293-32 HTR A~~	B020	N/A	Y 20	N/A	N/A	"	DISA030	N 30	10 10	1PL336 1PL337
12F	1-HTR-30-11H ~~1-PENT 293-32 HTR A~~	B020	N/A	20	N/A	N/A	"	"	Y 30	10 10	1PL5440 1PL5441
13A	1-CRN-78-1M ~~1-PENT 293-5~~	B040	N/A	40	N/A	N/A	"	DISA050	Y 50	6	1PL621
13D	1-AHU-61-1T028 ~~1-PENT 293-5~~	FJ3-B175	LO ~~HE~~	750 ~~1600~~ ~~N~~ Y	N/A	N/A	SHAW-MUT	CP6A-14 4/0	~~N~~ Y 2/15/90 RKB ~~N~~ Y 2/17/90	6 4/0x2 2/0	1PL622 1PL820 1PL821
14B	1-MTR-61-2B0A ~~1-PENT 293-5~~	EF3-A010	4 ~~Z~~	Y 58 ~~36~~	1	T30 ~~T29~~	"	TRS-30	N 30	12 12	1PL587 1PL588
14D	1-AHU-61-3T027 ~~1-PENT 293-5~~	FJ3-B150	LO ~~HE~~	Y 750 ~~1600~~ Y	N/A	N/A	SHAW-MUT	CP6A-14 4/0	~~N~~ Y 2/15/90 ~~N~~ Y RKB 2/17/90	4/0 2/0	1PL861 1PL862
15A	1-HTR-30-35H ~~1-PENT 293-32 (1-HTR-30-35H)~~	EF3-B070	N/A	Y 70	N/A	N/A	"	DISAB100	N 100	4 4	1PL425 1PL426
15D	1-MTR-30-1	~~A100 B100~~	~~3 N/A~~	~~Y 750 100~~	3	T56	N/A	N/A	N/A	2x2	1PL777
16A	1-HTR-30-33H ~~1-PENT 293-5~~	B070	N/A	Y 70	N/A	N/A	SHAW-MUT	DISAB100	N 100	4 4	1PL440 1PL441
16D	1-MTR-30-1E	A100	3	760	3	T56	N/A	N/A	N/A	2	1PL764

R15 m.n. 4/11/92 J.L.H. 04-21-92

R15 m.n. 4/11/92 J.L.H. 04-21-92

Form GO-3.08.1 Rev. 2 SL-F647 04/84

THIS SHEET ADDED BY REV 15

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchart Date 1/22/90 Checked [illegible] Date 1/26/90
[illegible] 1/16/90 R.H. Buchart 1/25/90
[illegible] 2/5/90 R. Supkar 2-5-90

1-MCC-232-B

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING (A)	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION MFR	SECONDARY PROTECTION MODEL	SECONDARY PROTECTION RATING	CABLE SIZE	CABLE NO
		EF3-				G30					
2A	~~1-MTR-77-115B~~ ~~1-PENT-293-47~~ ~~(1-MTR-77-125B)~~	A010	~~4~~	~~Y45~~ Y58	1	T33	SHAW-MUT	TRS-30	N30	12 10	1PL672 1PL673
3A	1-MTR-94-1A ~~1-PENT-293-35~~	B020	N/A	Y20	N/A	N/A	"	"	Y30	10 10	1PL280 1PL281
3B	1-MTR-94-1B ~~1-PENT-293-35~~	B020	N/A	Y20	N/A	N/A	"	D15A030	N30	10 10	1PL285 1PL286
3C	1-MTR-94-1C ~~1-PENT-293-35~~	B020	N/A	Y20	N/A	N/A	"	D15A030	N30	10 10	1PL290 1PL291
5E	1-MTR-30-11	A003	HI ~~2~~	Y ~~40~~ 21	1	T18 ~~T16~~	N/A	N/A	N/A	12	1PL794
6A	0-MTR-31-26	A010	4	Y58	1	T34	N/A	N/A	N/A	12	1PL752
6C	1-MTR-61-61	L050	4	N330	2	T51	N/A	N/A	N/A	8	1PL4325
6D	1-HTR-61-93	B050Z	N/A	Y50		T54 ~~T51~~	N/A	N/A	N/A	6	1PL4310
6E	1-MTR-30-11E	A003	HI ~~2~~	Y ~~40~~ 21	1	T18 ~~T16~~	N/A	N/A	N/A	12	1PL760
6F1	1-MTR-40-2 ~~1-STR-40-2~~	B020	N/A	Y20	N/A	N/A	SHAW-MUT	D15A030	N30	10	1PL695
7B	1-HTR-68-31AA ~~1-PENT-293-35~~	A010	LO ~~4~~	Y ~~58~~ 27	1	T31 ~~T36~~	"	TRS-30	N30	12 12	1PL376 1PL377
7D	1-MTR-68-85 ~~1-PENT-293-35~~	B040	N/A	Y40	1	T45 ~~T44~~	"	"	Y30	10 10	1PL402 1PL403
8B	1-HTR-68-73AA ~~1-PENT-293-47~~	A010	LO ~~2~~	Y ~~36~~ 27	1	T31 ~~T36~~	"	"	N30	12 12	1PL388 1PL389
8D	1-MTR-68-87 ~~1-PENT-293-47~~	B040	N/A	Y40	1	T45 ~~T44~~	"	"	Y30	10 10	1PL414 1PL415
8F1	DXF 0-~~SW~~-234-B/IPS	B ~~030~~ 40	N/A	Y ~~30~~ 40	N/A	N/A	SHAW-MUT	D15A030	Y30	1/0X2	1PL1115
9B	1-MTR-30-97 ~~1-PENT-293-35~~	A025	LO	Y75	1	T40	"	TRS-30	Y30 N	10 12	1PL531 1PL532

R15 m.n. 4/4/92 J.I.H. 04-21-92

R15 m.n. 4/4/92 J.I.H. 04-21-92

THIS SHEET ADDED BY REV 15

R15 rev. 4/14/92

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Bucheit Date 1/22/90 Checked kmgmucker Date 1/26/90
kmgmucker 1/16/90 R.H. Bucheit 1/25/90
LLBates 2/5/90 R. Suplkar 2-5-90

1-MCC-232-B

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING (A)	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION MFR	SECONDARY PROTECTION MODEL	SECONDARY PROTECTION RATING	CABLE SIZE	CABLE NO
		EF3-				G30					
10B	1-MTR-30-100 ~~1-PENT-293-47~~	A025	~~2~~ LO	Y ~~75~~ ~~105~~	1	T40	SHAWMUT	TRS-30	Y 30	10	1PL561
				Y					N	12	1PL562
10F	1-CRN-78-15 ~~1-PENT-293-11~~	B020	N/A	Y 20	N/A	N/A	"	"	Y 30	10	1PL707
										10	1PL708
11D	1-MTR-77-6 ~~1-PENT-293-11~~	B070 ~~B100~~	N/A	Y ~~70~~ ~~100~~	2	T48 ~~T69~~	"	TRS-60	Y 60	4	1PL496
										4	1PL497
11F	1-HTR-30-75H ~~1-PENT-293-35~~	B020	N/A	Y 20	N/A	N/A	"	D15A030	N 30	10	1PL345
										10	1PL346
12F	1-HTR-30-12H ~~1-PENT-293-35~~	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10	1PL5450
										10	1PL5451
13B	1-MTR-61-280B ~~1-PENT-293-11~~	A010	4 ~~2~~	Y ~~58~~ ~~36~~	1	T30 ~~T25~~	"	TRS-30	Y 30	10	1PL598
				Y					N	12	1PL599
13D	1-AHV-61-2T030 ~~1-PENT-293-11~~	FJ3-B175	LO ~~HI~~	Y 750 ~~4600~~	N/A	N/A	"	CP6A-14 4/0	N Y 2/12/90	4/0	1PL897
				Y					~~N~~ Y ~~2/24/92~~	2/0	1PL975
									~~N~~ Y ~~2/24/92~~	2/0	1PL902 *
13F	1-CRN-61-1BC ~~1-PENT-293-11~~	B030 ~~EF3-B050~~	N/A	Y ~~30~~ ~~50~~	N/A	N/A	"	D15A050	Y 50	6	1PL712
										6	1PL713
14B	1-CRN-78-1RCC ~~1-PENT-293-11~~	A003	HI ~~LO~~	Y 21 ~~7~~	1	T18 ~~T12~~	"	TRS-30	N 30	12	1PL1100
										12	1PL1101
14D	1-AHU-61-5T029 ~~1-PENT-293-11 (AHU)~~	FJ3-B150	LO ~~HI~~	Y ~~750~~ ~~1600~~	N/A	N/A	"	CP4/0-CS	Y	4/0	1PL937
				Y						2/0	1PL938
										2/0	1PL943 *
14F	1-CRN-78-1EH ~~1-PENT-293-11~~	B030 ~~EF3-B040~~	N/A	Y ~~30~~ ~~40~~	N/A	N/A	"	D15A050	Y 50	6	1PL704
										6	1PL705
15A	1-HTR-30-37H ~~1-PENT-293-35~~	B070	N/A	Y 70	N/A	N/A	"	D15AB100	N 100	4	1PL454
										4	1PL455
15D	1-MTR-30-4	A100	3	Y ~~750~~ ~~760~~	3	T56 ~~T57~~	N/A	N/A	N/A	2	1PL785
16A	1-HTR-30-100H ~~1-PENT-293-47~~	B070	N/A	Y 70	N/A	N/A	SHAWMUT	D15AB100	N 100	4	1PL468
										4	1PL469
16D	1-MTR-30-4E	A100	2 ~~3~~	Y ~~630~~ ~~760~~	3	T56 ~~T57~~	N/A	N/A	N/A	2	1PL768

* 1PL 902 → 1PL 907 (2/0) → 1PL 912 (2/0) → 1PL 917 (2/0) → 1PL 922 (2/0) → 1PL 927 (2/0) → 1PL 932 (2/0)

** 1PL 943 → 1PL 948 (2/0) → 1PL 953 (2/0) → 1PL 958 (2/0) → 1PL 963 (2/0) → 1PL 968 (2/0)

R15 rev. 4/14/92 J.L.H. 04-21-92

Form GO-3.08.1 Rev. 2 SL-F647 04/84

THIS SHEET ADDED BY REV 15

R15 m.n. 4/21/92 JLB 2/15/90 Tmm 3-7-91

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Buchholz Date 1/22/90 Checked kmg/mcdaniel Date 1/26/90
kmg/mcdaniel 1/16/90 Doug Kelley 1/25/90
J.S. Bates 2/5/90 R. Sukkar 2-5-90

2-MCC-213-A1

COMPT ND	SERVICE	BKR TYPE EF3-	SET POS	TRIP RATING (A)	STR SIZE	OL HTR CAT # G30	SECONDARY PROTECTION MFR	MODEL	RATING	CABLE SIZE	CABLE NO
16A	2-PENT-293-32 ~~(2-MTR-31-265)~~	A010	3	Y 45	1	T34	SHAW-MUT	TRS-30	Y 30 N	10 12	2PL6300 2PL6301
16B	2-PENT-293-24 ~~(2-MTR-77-129)~~	A010	LO	Y 27	1	T27	"	"	Y 30 N	10 12	2PL6268 2PL6269
16F1	CHGR ~~D-X5W~~-252-1	ED63-B030 ~~B020~~	N/A	~~Y 30~~ Y 20	N/A	N/A	N/A	N/A	N/A	10	2PL6040
16F2	MTR 2-TB-31-303/2	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	2PL6289
17A	2-HTR-62-228/4 ~~0-JB-292-2051 (2-HTR-62-228/4)~~	B040 ~~B030~~	N/A	Y 40 ~~30~~ Y	none price missing	N/A	N/A	N/A	N/A	8 12 12	2PL6208 2PL6209 2PL6210
17E	2-PO-213-A1/1-5 ~~2-PENT-293-32 (2-PO-213-A1/1-4) (2-PO-213-A1/5)~~	ED63-B100	N/A	Y 100	N/A	N/A	SHAW-MUT	CPCA-197 #2 JLB 2/15/90 RRB 2/15/90	NY	2 2	2PL6100 2PL6094
18C	2-MTR-31-303/1	A010	3	Y 45	1	T32	N/A	N/A	NA	12	2PL6281
18F1	CHGR ~~D-X5W~~-253-1	ED63-B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	PL888
18F2	2-PO-213-A1/6-10 ~~2-JB-293-2860 (2-PO-213-A1/6-10)~~	ED63-B100	N/A	Y 100	N/A	N/A	N/A	N/A	N/A	2	2PL6093

R15 m.n. 4/21/92 J.I.H. 04-21-92

R15 m.n. 4/21/92 J.I.H. 04-21-92

THIS SHEET ADDED BY REV 15

R15 m.n. 4/17/92 Tmm 9-7-91

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Engineer Engineer Date 1/22/90 1/16/90 Checked R.H. Buchert Brook McKelley Date 1/26/90 1/25/90

2-MCC-213-A2

COMPT NO	SERVICE	BKR TYPE EF3-	SET POS	TRIP RATING (A)	STR SIZE	DL HTR CAT# G30	SECONDARY PROTECTION MFR	SECONDARY PROTECTION MODEL	SECONDARY PROTECTION RATING	CABLE SIZE	CABLE NO
4A	2-FCV-3-191	A010	3	Y45	1	T31	N/A	N/A	N/A	12	2V3260
4B	2-FCV-3-192	A010	3	Y45	1	T31	N/A	N/A	N/A	12x2	2V3280
13B	0-FCV-67-360	A010	~~2~~ ~~0~~	Y36 ~~27~~	1	T29 ~~T28~~	N/A	N/A	N/A	12	2V3230

R15 m.n. 4/13/92 J.I.H. 04-21-92

THIS SHEET ADDED BY REV 15

R15 w.a. 4/13/92

YLB 2/5/90 301

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R. H. Bucknot Date 1/22/90 Checked [illegible] Date 1/26/90
[illegible] 1/16/90 Scott Kelley 1/25/90
J.L. Bates 2/5/90 R. Supkar 2-5-90

2-MCC-213-B1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
3F1	CHGR 0-~~XSW~~-252-2	30 B020 ED63-	N/A	Y 30 ~~20~~	N/A	N/A	N/A	N/A	N/A	10	2PL6045
16A	2-PENT-293-35 (2-MTR-31-266)	A010	3	Y 45 Y	1	T34	SHAW-MVT	TAS-3.0	Y 3.0 N	10 12	2PL6310 2PL6311
16E	2-PO-213-B1/1-5 ~~2-PENT-293-47~~ ~~(2-PO-B13-31/1-5)~~	B100	N/A	Y 100	N/A	N/A	"	CPGA-81-197 #2	NY 2/15/90 AEG 2/15/90	2X2 2	2PL6085 2PL6086
17A	2-HTR-62-228/3 ~~0-JB-292-2048~~ ~~(2-HTR-62-226)~~	B040	N/A	Y 40 N N N Y N N T	2	N/A	N/A	N/A	N/A	8X2 12 12	2PL6214 2PL6215 2PL6216
17E	2-PO-213-B1/6-10 ~~2-PENT-293-35~~ ~~(2-PO-213-31/6-10)~~	B100	N/A	Y 100	N/A	N/A	SHAW-MVT	CPGA-197 #2	NY 2/15/90 AEG 2/15/90	2 2	2PL6075 2PL6076
17F1	CHGR 0-~~XSW~~-253-2	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	PL894
17F2	MTR 2-~~TB~~-31-324/2	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	2PL6291
18C	2-MTR-31-324/1	A010	3	Y 45	1	T32	N/A	N/A	N/A	10	2PL6285

R15 w.a. 4/13/92 J.I.H. 04-21-92

R15 w.a. 4/13/92 J.I.H. 04-21-92

R15 w.a. 4/13/92 J.I.H. 04-21-92

Form GO-3.08.1 Rev. 2 SL-F647 04/84

THIS SHEET ADDED BY REV 15

~~APPENDIX H~~ ~~Page 187 of 201~~ ~~186 of 200~~ MAB 2/5/90 TMB 3-7-91

R15 m.a. 4/13/92

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmy/nuclar kmy/nuclar Date 1/22/90 1/16/90 Checked R.A. Buchart Scott Melley Date 1/26/90 1/25/90

2-MCC-213-B2

COMPT ND	SERVICE	BKR TYPE EF3-	SET POS	TRIP RATING (A)	STR SIZE	OL HTR CAT # G30	SECONDARY PROTECTION MFR	SECONDARY PROTECTION MODEL	SECONDARY PROTECTION RATING	CABLE SIZE	CABLE NO
4A	2-FCV-3-193	A010	3	Y45	1	T31	N/A	N/A	N/A	12x2	2V3290
4B	2-FCV-3-194	A010	3	Y45	1	T31	N/A	N/A	N/A	12	2V3270
5A	0-FCV-26-15	A003	LO	Y7	1	~~T6~~ T9	N/A	N/A	N/A	12	2V3360
5B	0-FCV-26-16	A003	LO	Y7	1	~~T6~~ T9	N/A	N/A	N/A	12	2V3370

R15 m.a. 4/13/92 J.I.H. 04-21-92

THIS SHEET ADDED BY REV 15

GLB 2/5/90
Tom B 3-7-91
R15 min. 4/24/92

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.H. Bucfant knight nuclear Date 1/22/90 1/16/90 Checked knight nuclear Scott Kelley Date 1/26/90 1/25/90

2-MCC-214-A1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO	
		EF3-		(A)		G30	MFR	MODEL	RATING			
2D	2-MTR-81-3	H050	2	Y 400	3	T51	N/A	N/A	N/A	6	2PL3221	
2F1	0-DXF-234-A2/SIS	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	HFCP	N 30	10	2PL3590	
2F2	2-DXF-242-1	~~FXD 63 B125 B070~~	~~5 N/A~~	N ~~X~~ 1200 ~~70~~	N/A	N/A	"	"	N 100	4	2PL3596	R15 min. 4/24/92 J.L.H. 04-24-92
3F1	2-RE-90-119	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10	2PL3589	
0F1	0-TB-40-3	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10	2PL3720	
12F2	0-DXF-227-1	B050	N/A	Y 50	N/A	N/A	"	"	Y 50	6	2PL3713	
7D	0-DXF-234-A1/CVCS	FJB-B125	N/A	Y 125	N/A	N/A	N/A	N/A	N/A	1/0	2PL3580	
4F2	0-DXF-234-A4/CVCS	~~EF3-~~ B020	N/A	Y 20	N/A	N/A	SHAW-MUT	HFCP	N ~~30~~ 20	10	2PL3017	R15 min. 4/24/92 J.L.H. 04-24-92
12E1	2-PNL-90-L398	B020Z	N/A	Y 20	N/A	N/A	"	"	N 30	10	2PL3610	
13A	2-MTR-84-16	A005	3	Y 22	1	T25	N/A	N/A	N/A	12	2PL2940	
13C	2-MTR-65-77	A005	HI	Y 41	1	T31	N/A	N/A	N/A	12	2PL3645	

THIS SHEET ADDED BY REV 15

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Kajmudar Date 1/22/90 Checked R.H. Buchart Date 1/26/90
R.A. Buchart 1/10/90 Scott Kelley 1/25/90

2-MCC-214-B1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2D	2-MTR-81-7	A050	2	Y400	3	T51	N/A	N/A	N/A	6	2PL3228
3F2	0-DXF-234-B2 SIS	B020	N/A	Y20	N/A	N/A	SHAW-MUT	DISA030*	N30	10	2PL3375
2F1	0-TB-40-66	B020	N/A	Y20	N/A	N/A	"	"	N30	10	2PL3730
9F1	2-XFMR-290-236 ~~2-RNL-55-L237~~	B020	N/A	Y20	N/A	N/A	SHAW-MUT	DISA030*	N30	10	2PL2972
12A	2-MTR-30-181	A010	3	Y45	1	T32	N/A	N/A	N/A	10	2PL3021
7D	0-DXF-234-B1 CVCS	FJ3-B125	HI	Y1600	N/A	N/A	N/A	N/A	N/A	2/0	2PL3744
12F1	2-RE-90-99	EF3-B020	N/A	Y20	N/A	N/A	SHAW-MUT	DISA030*	N30	10	2PL3790
13A	2-MTR-84-21	A005	3	Y22	1	T25	N/A	N/A	N/A	12	2PL2948
12F2	0-DXF-227-3	B070	N/A	Y70	N/A	N/A	SHAW-MUT	DISAB160*	N100	4	2PL3719
13C	2-MTR-65-74	A005	HI	Y41	1	T31	N/A	N/A	N/A	12	2PL3660

R15 m.n. 4/13/92 J.I.H. 04-21-92

Shamut DISA and HFCP are the same fuse.

Form GO-3.08.1 Rev. 2 SL-F647 04/84

THIS SHEET ADDED BY REV. 15

~~APPENDIX H~~ ~~Page 190 of 201~~ ~~189 of 201~~ R15 m.a. 4/13/92 TMB 3-7-96

~~WBN EEB-MS-TI15-0011 R9~~ ~~Page H61 of H72~~

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Engineer Date 1/22/90 Checked R.H. Buchanan Date 1/26/90
Engineer 1/16/96 Drew Kelley 1/25/90

2-MCC-214-A2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2D1	2-HTR-30-A1A	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	DISA030	N 30	10	2PL3280
6D1	0-HTR-30-AB1	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10	2PL2815
2E1	2-HTR-30-B1A	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10	2PL3284
6F1	0-HTR-31-339	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10	2PL3833
7D1	0-HTR-30-AB2	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10	2PL2819
3A	2-MTR-30-25	A010	3	Y 45	1	T31	N/A	N/A	N/A	12x2	2PL2906
3D1	2-HTR-30-ACRD	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	DISA030	N 30	10	2PL3266
3E1	2-HTR-30-C1A	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10	2PL3288
3E2	2-HTR-31-D1A	B050	N/A	Y 50	N/A	N/A	"	DISA050	Y 50	6x2	2PL3510
3F1	0-HTR-31-91	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	DISA030	N 30	10	2PL2800
3F2	2-HTR-30-1A1	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10	2PL3365
4A	2-MTR-30-67	A005	~~4~~ HI	Y ~~29~~ 41	1	T29	N/A	N/A	N/A	12	2PL3621
4E1	2-HTR-30-BCRD	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	DISA030	N 30	10x2	2PL3264

R15 m.a. 4/13/92 J.I.H. 04-21-92

SL-F647 04/84

Form GO-3.08.1 Rev. 2

THIS SHEET ADDED BY REV. 15

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Engineer 1/22/90 1/16/90 Date Checked Engineer 1/26/90 1/25/90 Date

2-MCC-214-A2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
4F1	2-HTR-30-CCRD	B020	N/A	Y20	N/A	N/A	SHAWMUT	DISA030	N30	10X2	2PL3268
5A	2-MTR-30-301	A010	3	Y45	1	T34	N/A	N/A	N/A	12	2PL3435
5E1	0-HTR-31-71	B030	N/A	Y30	N/A	N/A	SHAWMUT	DISA030	Y30	8	2PL3691
5F1	2-HTR-30-XM1A	B020	N/A	Y20	N/A	N/A	"	"	N30	10	2PL3370
5F2	2-HTR-30-AB1	B020	N/A	Y20	N/A	N/A	"	"	N30	10	2PL3314
6E1	2-HTR-30-SMS	B030	N/A	Y30	N/A	N/A	"	"	Y30	8	2PL2811
6E2	2-HTR-30-NM1	B050	N/A	Y50	N/A	N/A	"	DISA050	Y50	6	2PL2806
6F2	0-HTR-30-KM3	B020	N/A	Y20	N/A	N/A	"	DISA030	N30	10	2PL3320
7D2	0-HTR-30-DFH	B040	N/A	Y40	N/A	N/A	"	DISA050	Y50	6	2PL3335
7E1	2-HTR-30-U1A	B020	N/A	Y20	N/A	N/A	"	DISA030	N30	10	2PL2813
7E2	0-HTR-30-EFH	B040	N/A	Y40	N/A	N/A	"	DISA050	Y50	6	2PL3330
7F2	0-HTR-30-FFH	B040	N/A	Y40	N/A	N/A	"	"	Y50	6	2PL3340
8A	2-MTR-30-~~CRD~~ CRA	FXD63 B125 ~~FD3 B125L~~	LO ~~HE~~	Y800 ~~Y600~~	N/A	N/A	N/A	N/A	N/A	2/0	2PL3692
8B	2-HTR-1-CBS	~~FXD63 FD3~~ FXD63 B125	LO ~~HE~~	Y800 ~~Y600~~	N/A	N/A	N/A	N/A	N/A	4/0	2PL3680

R15 m-a. 4/13/92 J.L.H. 04-21-92

Form GO-3.08.1 Rev. 2 SL-F647 04/84

THIS SHEET ADDED BY REV. 15

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R. H. Buchert Date 1/22/90 Checked [illegible] Date 1/27/90
[illegible] 1/16/90 R. H. Buchert 1/25/90

2-MCC-214-B2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO	
		EF3-		(A)		G30	MFR	MODEL	RATING			
2B	0-MTR-30-27	A005	~~HI~~ 4	Y ~~39~~ 41	1	~~T28 I27~~	N/A	N/A	N/A	12	2PL3812	R15 m.n. 4/13/92 J.I.H. 04-21-92
2E1	2-HTR-30-AIB	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	D15A030	N 30	10	2PL3676	
2E2	0-HTR-30-KFA	B040	N/A	Y 40	N/A	N/A	"	D15A050	Y 50	6	2PL3400	
2F1	2-HTR-30-BIB	B020	N/A	Y 20	N/A	N/A	"	D15A030	N 30	10	2PL3898	
2F2	2-HTR-31-BRB	B050	N/A	Y 50	N/A	N/A	"	D15A050	Y 50	6	2PL3890	
3B	2-MTR-30-285	A005	~~HI~~ 4	Y ~~39~~ 41	1	~~T30 F29~~ T30	N/A	N/A	N/A	12	2PL3626	R15 m.n. 4/13/92 J.I.H. 04-21-92
3F2	0-HTR-31-93	B040	N/A	Y 40	N/A	N/A	SHAW-MUT	D15A050	Y 50	6	2PL3851	
3E1	2-HTR-30-CIB	B020	N/A	Y 20	N/A	N/A	"	D15A030	N 30	10	2PL3895	
3E2	0-HTR-30-LFA	B040	N/A	Y 40	N/A	N/A	"	D15A050	Y 50	6	2PL3405	
3F1	2-HTR-30-PRX	B020	N/A	Y 20	N/A	N/A	"	D15A030	N 30	10	2PL3395	
4B	2-MTR-30-302	A010	~~4~~ 3	Y ~~45~~ 58	1	~~T33 F32~~ T33	N/A	N/A	N/A	12	2PL3438	R15 m.n. 4/17/92 J.I.H. 04-21-92
4E1	0-HTR-31-85	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	D15A030	N 30	10	2PL2809	
4E2	0-HTR-30-PFA	B040	N/A	Y 40	N/A	N/A	"	D15A050	Y 50	6	2PL3415	
4F1	2-HTR-30-SBU	B020	N/A	Y 20	N/A	N/A	"	D15A030	N 30	10	2PL3425	
4F2	2-HTR-30-U113	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10	2PL2975	
5E1	2-HTR-31-89	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	D15A030	N 30	10	2PL2825	

THIS SHEET ADDED BY REV. 15

R15 m.a. 4/13/92

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R.A. Buchert Date 1/22/90 Checked [illegible] Date 1/27/90
[illegible] 1/16/90 R. H. Buchert 1/20/90

2-MCC-214-B2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	DL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
5F1	0-HTR-30-RM4	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	D15A030	N 30	10	2PL3385
6B	2-MTR-30-26	A010	4 B	Y ~~45~~ 58	1	T33	N/A	N/A	N/A	12	2PL2913
6E1	2-HTR-30-AB7	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	D15A030	N 30	10	2PL3381
6F1	2-HTR-30-T1B	B020	N/A	Y 20	N/A	N/A	"	"	N 30	10	2PL3430
5F2	0-HTR-30-U1	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	D15A030	N 30	10	2PL2817
7F1	2-HTR-30-NM2	B050	N/A	Y 50	N/A	N/A	"	D15A050	Y 50	6	2PL3421
7E1	0-HTR-31-99	B020	N/A	Y 20	N/A	N/A	"	D15A030	N 30	10	2PL3840
8F2	~~2-FB-292-19~~ 2-PO-214-10-12	B100	N/A	Y 100	N/A	N/A	"	D15AB/100	Y 100	2	2PL2785
9A	2-MTR-30-CRB	FXD63 B125	LO	Y ~~750~~ 800	N/A	N/A	N/A	N/A	N/A	2/0	2PL3671
8E2	0-HTR-30-A14	B020	N/A	Y 20	N/A	N/A	SHAW-MUT	D15A030	N 30	10	2PL3390

R15 m.a. 4/13/92 J.I.H. 04-21-92

R15 m.a. 4/13/92 J.I.H. 04-21-92

Form GO-3.08.1 Rev. 2 SL-F647 04/84

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JJB 2/5/90
R15 m.a. 4/13/92
TIR # 3-7-91

~~N EEB-MS-TI15-0011 R0~~
~~ulation~~ of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmg/mcdw Date 1/22/90 Checked R.H. Bucheit Date 1/26/90
R. H. Bucheit 1/17/90 kmg/mcdw 1/25/90

2-MCC-215-A1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
5A	2-MTR-82-241	A025	~~2~~ ~~1.0~~	Y ~~105~~ ~~75~~	1	T ~~39~~ ~~38~~	N/A	N/A	N/A	12	PL2205
5F1	0-HTR-30-480	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	PL2334
5F2	2-PO-215-1-5 ~~2JB-296-257 (P.O.'S)~~	B100	N/A	Y 100	N/A	N/A	N/A	N/A	N/A	2	PL2543
6A	MTR 2-~~SW~~-30-464	A005	HI ~~2~~	Y ~~41~~ ~~18~~	1	T28 ~~T26~~	N/A	N/A	N/A	12	PL2242

R15 m.a. 4/13/92 JJH 04-21-92

R15 m.a. 4/13/92 J.J.H. 04-21-92

THIS SHEET ADDED BY REV. 15

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Kmajmudar Date 1/22/90 Checked R.H. Buchart Date 1/26/90
R.H. Buchart 1/17/90 Kmajmudar 1/25/90

2-MCC-215-B1

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO	
		EF3-		(A)		G30	MFR	MODEL	RATING			
5A	2-MTR-82-271	A025Z	~~LO~~ 2	Y ~~75~~ 105	1	~~T36~~ T39	N/A	N/A	N/A	12	PL2225	R15 m.a. 4/13/92 J.L.H. 04-21-92
5F1	0-HTR-30-482	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	PL2328	
6A	MTR 2-~~SW~~-30-466	A005	HI ~~X~~	Y ~~16~~ 41	1	~~F26~~ T29	N/A	N/A	N/A	12	PL2255	R15 m.a. 4/17/92 J.L.H. 04-21-92
5F2	2-PO-215-5,6,7 ~~2-JB-296-259 (P.O.'s)~~	B100	N/A	Y 100	N/A	N/A	N/A	N/A	N/A	2	PL2556	

THIS SHEET ADDED BY REV 15

lation of Non-1E Power Circuits Located in Category 1 Structures

Prepared kmg/m-ater Date 1/24/90 Checked R.H. Bucknart Date 1/26/90
R.H. Bucknart 1/17/90 kmg/m-ater 1/25/90

2-MCC-215-A2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
3E1	2-HTR-30-488	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	PL2413
3F1	2-HTR-30-475	B030	N/A	Y 30	N/A	N/A	N/A	N/A	N/A	8	PL2286
3F2	2-HTR-30-476	B030	N/A	Y 30	N/A	N/A	N/A	N/A	N/A	8	PL2292
5A	2-MTR-82-240	A025	~~2~~ ~~LO~~	Y ~~75~~ 105	1	T38	N/A	N/A	N/A	12	PL2210
6D	2-HTR-82-100 ~~2-TB-82-A/1-A~~	B020	N/A	Y 20	1	N/A	N/A	N/A	N/A	12	PL2703

R15 m.r. 4/13/92 J.L.H. 04-21-92

THIS SHEET ADDED BY REV 15

MLB 2/5/90 R15 mwa 4/13/92

~~EEB-MS-TI15-0011 R0~~

Calculation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Engineer Date 1/22/90 Checked R.A. Buchert Date 1/26/90
R.A. Buchert 1/17/90 Engineer 1/25/90

2-MCC-215-B2

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT #	SECONDARY PROTECTION			CABLE SIZE	CABLE NO	
		EF3-		(A)		G30	MFR	MODEL	RATING			
3E1	2-HTR-30-490	B020	N/A	Y 20	N/A	N/A	N/A	N/A	N/A	10	PL2414	
3F1	2-HTR-30-477	B030	N/A	Y 30	N/A	N/A	N/A	N/A	N/A	8	PL2298	
3F2	2-HTR-30-478	B030	N/A	Y 30	N/A	N/A	N/A	N/A	N/A	8	PL2775	
5A	2-MTR-82-270	A025	~~L0~~ 2	Y ~~75~~ 105	1	~~T38~~ T39	N/A	N/A	N/A	12	PL2230	R15 mwa 4/13/92 J.L.H. 04-21-92
6D	~~2-TB-82-BA-B~~ 2-HTR-82-200	B020	N/A	Y 20	1	N/A	N/A	N/A	N/A	12	PL2709	J.L.H. 04-21-92 mwa 4/13/92 R15
4B	0-MTR-18-913	A025	3	Y 25	1	T24	N/A	N/A	N/A	10	PL2460	

THIS SHEET ADDED BY REV. 15

EEB 2/5/90 R15 min. 4/14/92
Trans 3-7-91

~~WBN EEB-MS-TI15-0011 R0~~

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared R. H. Buchert Date 1/22/90 Checked [signature] Date 1/26/90
[signature] 1/16/90 David Kelley 1-25-90
[signature] 2/5/90 R. Sukkar 2-5-90
2-MCC-232-A

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO	
		EF3-		(A)		G30	MFR	MODEL	RATING			
2A	2-PENT-293-24	A010	3	Y 45 Y	1	T33	SHAW-MUT	TRS-30	Y 30 N	10 12	2PL653 2PL654	
3A	2-PENT-293-35 FLUX D	B020	N/A	Y 20	N/A	N/A	"	"	Y 30	10x2 10	2PL295 2PL296	
3B	2-PENT-293-35 FLUX E	B020	N/A	Y 20	N/A	N/A	"	D15A030	N 30	10x2 10	2PL300 2PL301	
3C	2-PENT-293-35 FLUX F	B020	N/A	Y 20	N/A	N/A	"	D15A030	N 30	10x2 10	2PL305 2PL306	
4D	2MTR-61-51	L050	4	N 330	2	T51	N/A	N/A	N/A	8	2PL4320	
4E	2-HTR-61-92	B050	N/A	Y 50	2	T51	N/A	N/A	N/A	6x2	2PL4300	
6C	0-MTR-77-105	H050	~~2~~ 2 ~~L0~~	Y ~~400~~ 320	2	T53 ~~T52~~	N/A	N/A	N/A	6x2	2PL5460	R15 m.e. 4/14/92 J.I.H. 04-21-92
7B	2-PENT-293-32 RCP 1 HTR	A010	2	Y 36	1	T36	"	TRS-30	N 30	12 12	2PL370 2PL371	
7D	2-PENT-293-32 RCP 1 LIFT	A025	4	Y 170	1	T44	"	"	Y 30	10 10	2PL396 2PL397	
7F2	2-PO-232-1-4 ~~2-JB-292-981 (1&2 OVERPOPTS)~~	B100	N/A	Y 100	N/A	N/A	SHAW-MUT	D15AB100	Y 100	2	2PL258	R15 m.e. 4/14/92 J.I.H. 04-21-92
8B	2-PENT-293-24 RCP 3 HTR	A010	2	Y 36	1	T36	"	TRS-30	N 30	12 12	2PL382 2PL383	
8D	2-PENT-293-24 RCP 3 LIFT	A025	3	Y 125	1	T44	"	"	Y 30	10 10	2PL408 2PL409	J.I.H. 04-21-92
8F2	2-PO-232-9,10	B100	N/A	Y 100	N/A	N/A	SHAW-MUT	D15AB100	Y 100	2	2PL240	R15 m.e. 4/14/92

THIS SHEET ADDED BY REV 15

~~APPENDIX H Page 200 of 201~~
~~199 of 200~~
RLB 2/5/90
R15 min. 4/24/92
3-7-91

~~WBN EEB-MS-TI15-0011 R0~~ ~~Page H71 of H72~~

Tabulation of Non-1E Power Circuits Located in Category 1 Structures

Prepared Kenneth Lyerla Date 1/22/90 Checked R.H. Bucknet Date 1/26/90
Kenneth Lyerla 1/16/90 Scott McKelley 1/25/90
RLBate 2/5/90 R. Sridhar 2-5-90

2-MCC-232-B

COMPT NO	SERVICE	BKR TYPE	SET POS	TRIP RATING	STR SIZE	OL HTR CAT#	SECONDARY PROTECTION			CABLE SIZE	CABLE NO
		EF3-		(A)		G30	MFR	MODEL	RATING		
2A	2-PENT-293-47	A010	3	Y45	1	T33	SHAW-MUT	TRS-30	N30	12 10	2PL672 2PL673
3A	2-PENT-293-32	B020	N/A	Y20	N/A	N/A	"	DISA030	N30	10X2 10	2PL280 2PL281
3B	2-PENT-293-32	B020	N/A	Y20	N/A	N/A	"	"	N30	10X2 10	2PL285 2PL286
3C	2-PENT-293-32	B020	N/A	Y20	N/A	N/A	"	"	N30	10X2 10	2PL290 2PL291
5E	2-MTR-30-11	A003	4	Y16	1	T16	N/A	N/A	N/A	12	2PL794
6F2	2-JB-292-1868	B100	N/A	Y100	N/A	N/A	SHAW-MUT	DISAB100	Y100	2	2PL233
6C	2-MTR-61-61	L050	4	N330	2	T51	N/A	N/A	N/A	8	2PL4325
6D	2-HTR-61-93	B050	N/A	Y50	2	T51	N/A	N/A	N/A	6X2	2PL4310
6E	2-MTR-30-11E	A003	2	Y10	1	T16	N/A	N/A	N/A	12	2PL760
6F1	2-~~STR~~ MTR-40-2	B020	N/A	Y20	N/A	N/A	SHAW-MUT	DISA030	N30	10	2PL695
7B	2-PENT-293-35	A010	2	Y36	1	T36	"	TRS-30	N30	12 12	2PL376 2PL377
7D	2-PENT-293-35	A025	4	Y170 Y	1	T44	"	"	Y30 Y	8 10	2PL402 2PL403
8B	2-PENT-293-47	A010	2	Y36	1	T36	"	"	N30	12 12	2PL388 2PL389
8D	2-PENT-293-47	A025	4	Y170	1	T44	SHAW-MUT	TRS-30	Y30	10 10	2PL414 2PL415
8F2	2-PO-232-16-19 ~~2-JB-292-1866~~	B100	N/A	Y100	N/A	N/A	SHAW-MUT	DISAB100	Y100	2	2PL242
9B	2-PENT-293-35	A025	1	Y75 Y	1	T40	"	TRS-30	Y30 N	10 12	2PL531 2PL532

R15 min. 4/24/92 J.M. 04/21/92

THIS SHEET ADDED BY REV 15

R:t COMPUTED [illegible] DATE 3 2491
CHECKED EJJ DATE 4/16/91

~~WBN EEB-MS-TI15-0011 R0~~ ~~ATTACHMENT 1 Page 44 of 200~~ ~~APPENDIX A~~ ~~Page A4 of A5~~ TMM 3-7-91 R15 m.a. 4/24/92

480 V Power Cable Associated Circuits

Prepared HH Date 2/2/90 Checked JMM Date 2/2/90

90°C RATED CABLE PROTECTION (0-10 SEC. REGION ONLY)

CABLE SIZE	MAXIMUM PROTECTIVE DEVICE RATING	REFERENCE	
# 2/0 AWG	W DS BKR SENSOR 150A LT DELAY @36 SEC. INST or START TIME PU upto 12 TIMES SENSOR RATING (THE USE OF OTHER SETTINGS SHOULD BE INVESTIGATED	TC-91 & ~~D16~~ D2 (APP.C) (APP.D)	R11
	ITE-FXD63B125	CURVE FXD63B125 (ATT. M08614A)	R15 m.a. 4/24/92 J.I.H. 04-24-92
#4/0 AWG	ITE-FJ3B225	TC-27 & ~~D21~~ D6 (APP.C&D)	R11
	W DS BKR SENSOR 300A LT DELAY @36SEC INST or SHORTTIME PU UPTO 12 TIMES SENSOR RATING (THE USE OF OTHER SETTINGS SHOULD BE INVESTIGATED	TC-7 & ~~D16~~ D2 (APP.C & D)	
	SHMT-CP6A-350MCM		
	SHMT-CP6-750 MCM		
	SHMT-CP-750 MCM		
	ITE-FXD63B125	CURVE FXD63B125 (ATT. M08614A)	R15 m.a. 4/24/92 J.I.H. 04-24-92

THIS SHEET ADDED BY REV 15

R15 m.a. 4/24/92

R11 COMPUTED TMB DATE 3-7-91
CHECKED EJJ DATE 4/16/91
~~WBN EEB-MS-TI15-0011R0~~

~~ATTACHMENT 1 Page 45 of~~
~~APPENDIX A~~ 200
~~Page AF of Final~~ TMB 3-7-91

480 V Power Cable Associated Circuits

Prepared HH Date 2/2/90 Checked JMK Date 2/2/90

90°C RATED CABLE PROTECTION (0-10 SEC. REGION ONLY)

CABLE SIZE	MAXIMUM PROTECTIVE DEVICE RATING	REFERENCE	
300 MCM	-W JA 225A -W LA 400A -W DS BKR SENSOR 600A LT Delay @ 20 Sec. INSTANT OR SHORT TIME PU 4 Ato 12 TIMES SENSOR RATING (THE USE OF OTHER SETTINGS SHOULD BE INVESTIGATED) -SHMT CP6-1000MCM -SHMT-CP6A-500MCM ITE-FXD63B225	TC-86 & ~~D12~~ D1 TC-33 & ~~D18~~ D3 TC-89 & ~~D16~~ D2 CURVE FXD63B225 (ATT. M08614A)	APP. C&D R15 m.a. 4/24/92 J.I.H. 04-24-92
400 MCM	SHMT CP6A UPTO 1000 MCM	TC-13 & ~~D-11~~ D4	(APP. C&D)

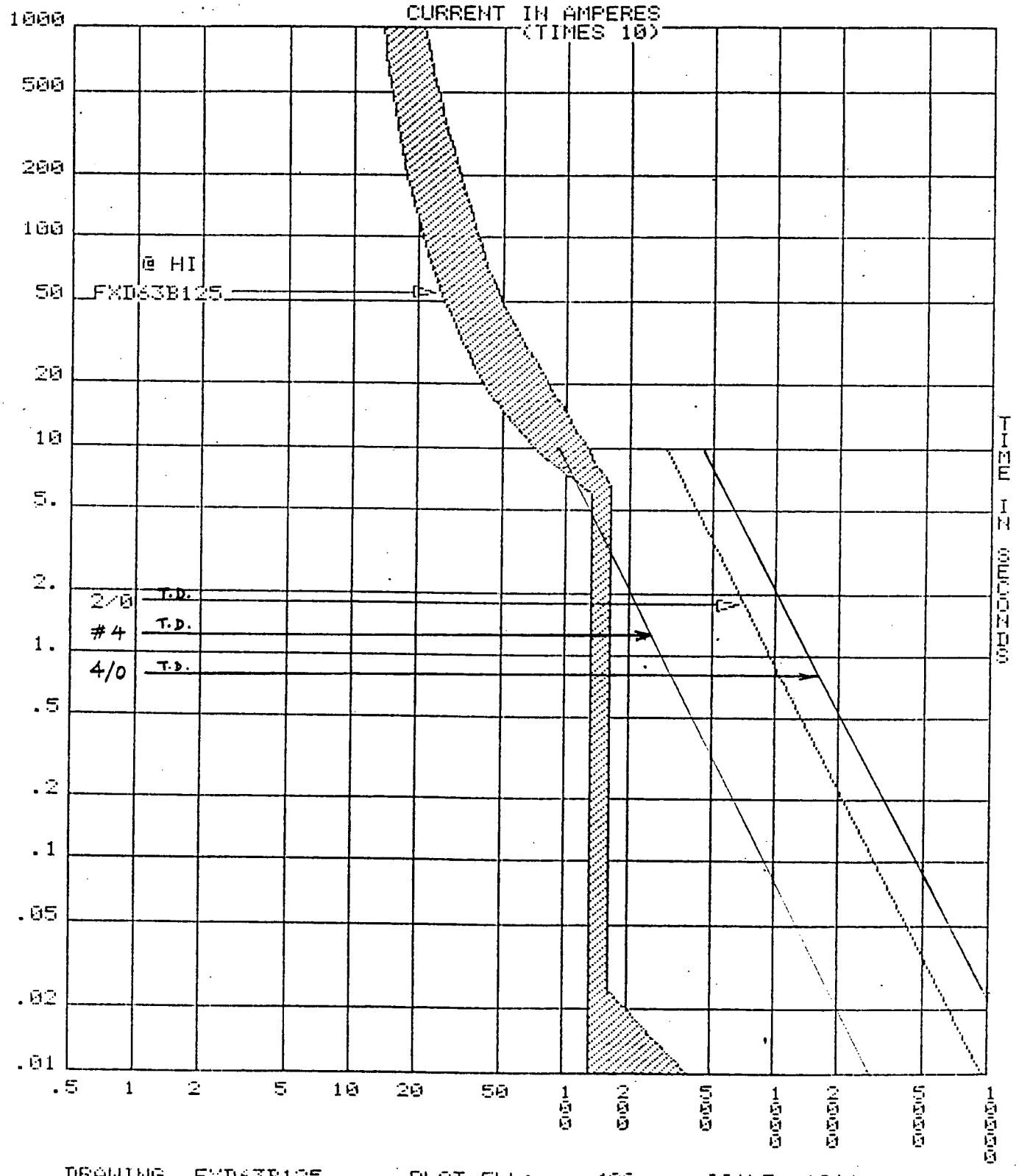
NOTES
1) THE MAXIMUM PROTECTIVE DEVICES LISTED AGAINST A 90° CABLE WILL PROTECT THAT CABLE THROUGH 0-10 SECONDS.
2) THE MAXIMUM PROTECTIVE DEVICES LISTED AGAINST A CABLE SIZE WILL ALSO PROTECT LARGER DIAMETER CABLES OF 90°C RATING THROUGH 10 SEC.
3) THE DIAMETER OF A CABLE INCREASES AS THE AWG NUMBER DECREASES FROM #14 TO #1

THIS SHEET ADDED BY REV 15

~~ATTACHMENT F13654A~~

~~PAGE 11~~

WBN EEB-MS-TI15-0011 PREPARED BY: M.A. DATE: 4/24/92
ATTACHMENT M08614A/M12212A CHECKED BY: J.L.H. DATE: 04-24-92
Appendix 5 Page 1



DRAWING FXD63B125 PLOT EL: 480 SCALE: 10^1

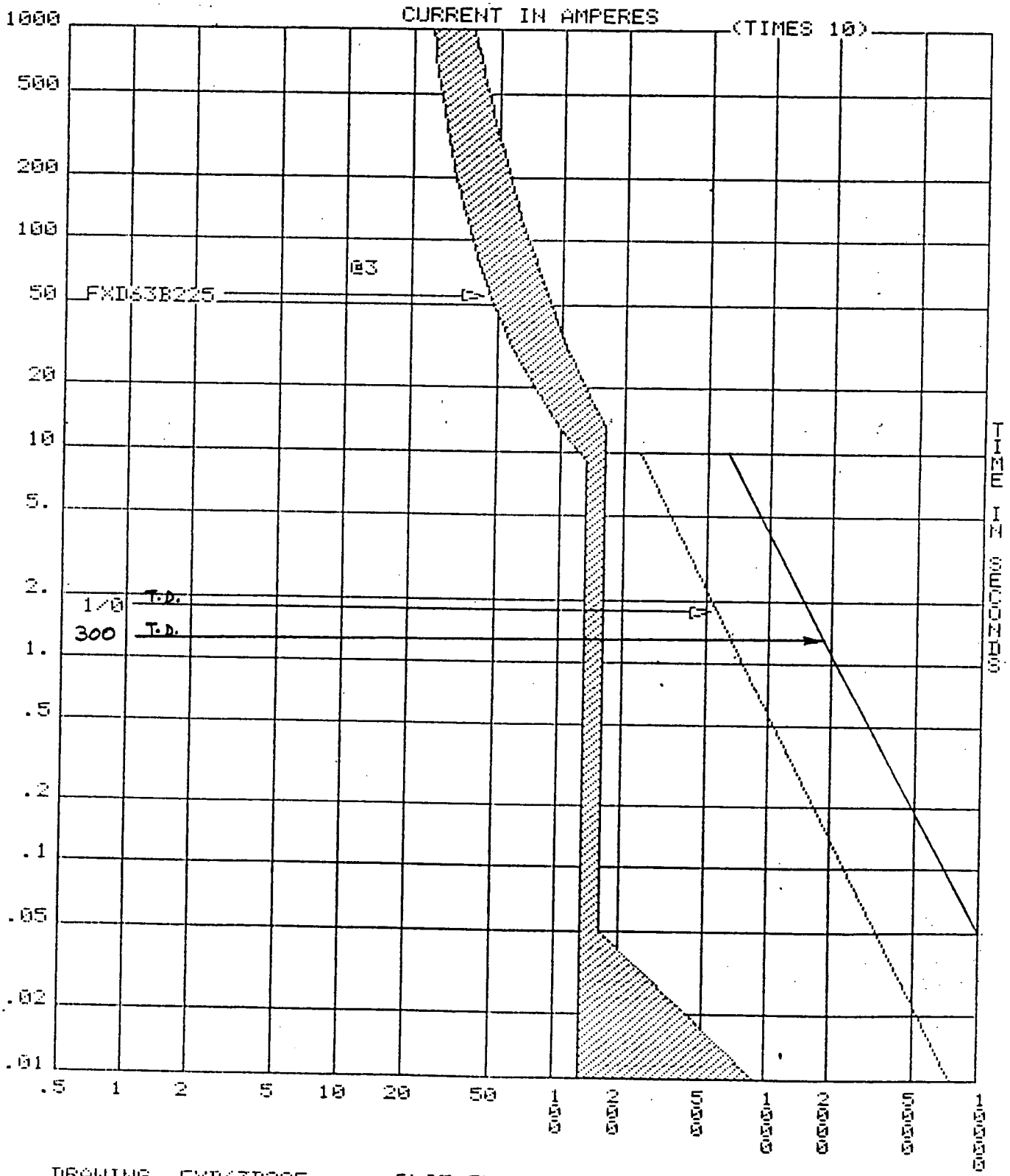
THIS SHEET ADDED BY REV 15

~~ATTACHMENT 1 TO 1365YA~~

~~PAGE 12~~

WBN EEB-MS-TI15-0011
ATTACHMENT M08614A/M12212A
Appendix 5 Page 2

PREPARED BY M.A. DATE 4/24/92
CHECKED BY J.H. DATE 04-24-92



DRAWING FXD63B225 PLOT ELL: 480 SCALE: 10^1

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