The Light company Houston Lighting & Power P.O. Box 1700 Houston, Texas 77001 (713) 228-9211

June 11, 1986
ST-HL-AE-1687
File No.: G9.18

Mr. Vincent S. Noonan, Project Director
PWR Project Directorate #5
U. S. Nuclear Regulatory Commission
Washington, DC 20555

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
Maximum Available Fault Current

Dear Mr. Noonan:

Additional information regarding maximum available fault currents at electrical penetrations was requested per the South Texas Project Safety Evaluation Report (SER), open item #10. The requested information, coordination curves which show the aforementioned fault current at the penetrations, is provided in the Attachment.

Based on information provided in this submittal, Houston Lighting & Power considers this item "closed".

If you should have any questions on this matter, please contact Mr. M. E. Powell at (713) 993-1328.

Very truly yours,

M. R. Wisenburg
Manager, Nuclear Licensing

JSP/yd

Attachment: Coordination Curves (38)

8606160232 860611
PDR ADOCK 05000498
E PDR

L1/NRC/bk

Aperture cards

Enc: Reg File

B001
1/1

cc:

Hugh L. Thompson, Jr., Director
Division of PWR Licensing - A
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Robert D. Martin
Regional Administrator, Region IV
Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, TX 76011

*N. Prasad Kadambi, Project Manager
U.S. Nuclear Regulatory Commission
7920 Norfolk Avenue
Bethesda, MD 20814

Claude E. Johnson
Senior Resident Inspector/STP
c/o U.S. Nuclear Regulatory
Commission
P.O. Box 910
Bay City, TX 77414

M.D. Schwarz, Jr., Esquire
Baker & Botts
One Shell Plaza
Houston, TX 77002

J.R. Newman, Esquire
Newman & Holtzinger, P.C.
1615 L Street, N.W.
Washington, DC 20036

Director, Office of Inspection
and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555

T.V. Shockley/R.L. Range
Central Power & Light Company
P.O. Box 2121
Corpus Christi, TX 78403

H.L. Peterson/G. Pokorny
City of Austin
P.O. Box 1088
Austin, TX 78767

J.B. Poston/A. vonRosenberg
City Public Service Board
P.O. Box 1771
San Antonio, TX 78296

*With copies of Attachment

Brian E. Berwick, Esquire
Assistant Attorney General for
the State of Texas
P.O. Box 12548, Capitol Station
Austin, TX 78711

Lanny A. Sinkin
Christic Institute
1324 North Capitol Street
Washington, D.C. 20002

Oreste R. Pirfo, Esquire
Hearing Attorney
Office of the Executive Legal Director
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Charles Bechhoefer, Esquire
Chairman, Atomic Safety &
Licensing Board
U.S. Nuclear Regulatory Commission
Washington, DC 20555

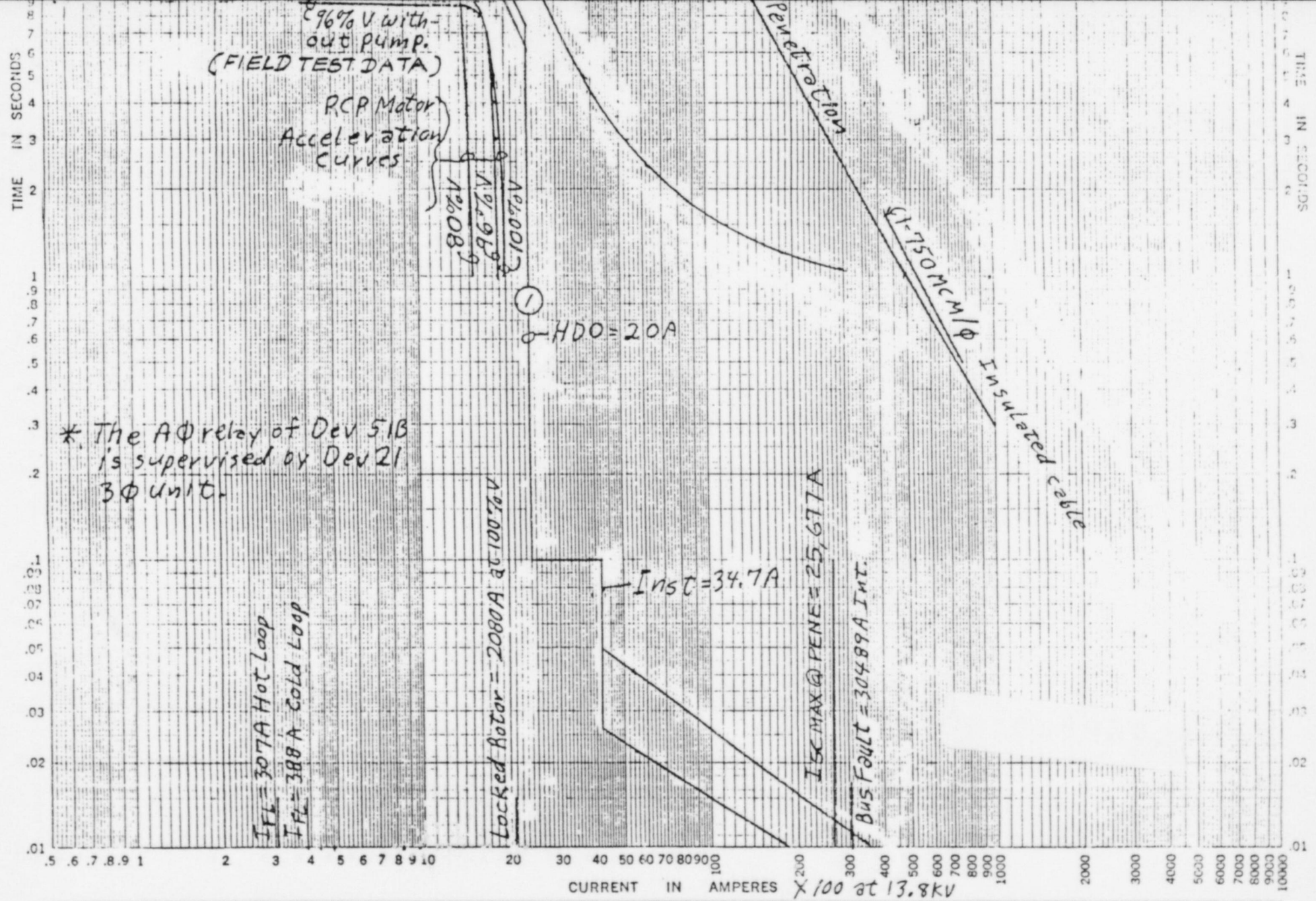
Dr. James C. Lamb, III
313 Woodhaven Road
Chapel Hill, NC 27514

Judge Frederick J. Shon
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Citizens for Equitable Utilities, Inc.
c/o Ms. Peggy Buchorn
Route 1, Box 1684
Brazoria, TX 77422

*Docketing & Service Section
Office of the Secretary
U.S. Nuclear Regulatory Commission
Washington, DC 20555
(3 Copies)

Advisory Committee on Reactor Safeguards
U.S. Nuclear Regulatory Commission
1717 H Street
Washington, DC 20555



SOUTH TEXAS PROJECT

TIME-CURRENT CHARACTERISTIC CURVES 8606160232-01

For 13.2KV RCP Motor & 15KV Penetration 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. SW-1

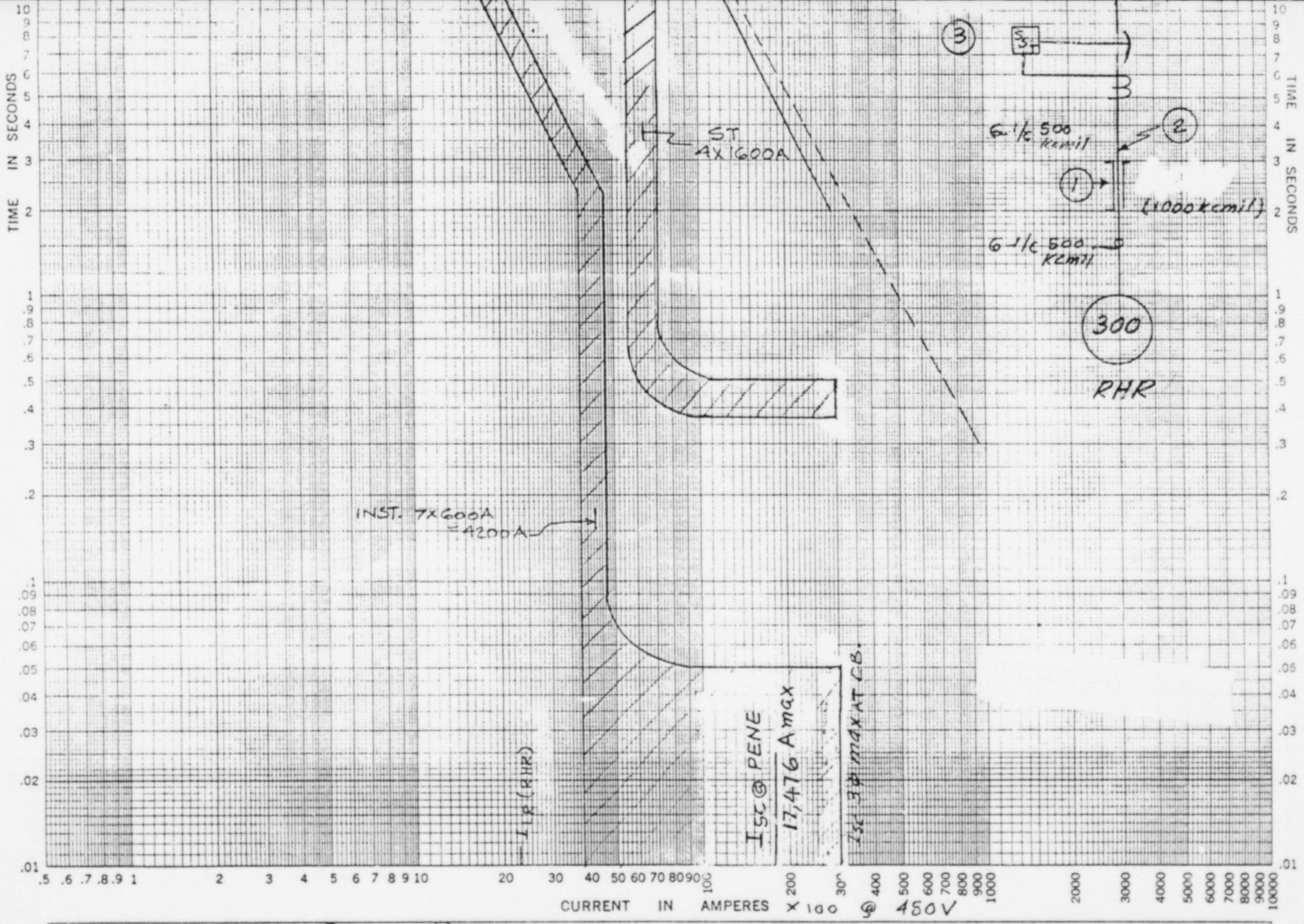
Date

CURVE No 1

TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-01



RESIDUAL HEAT REMOVAL PUMPS. TIME-CURRENT CHARACTERISTIC CURVES 8606160232-02

For SOUTH TEXAS PROJECT. 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. LC-2

Date Nov. 5, 1985.

CURVE NO 2

TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-02

REACTOR CONTAINMENT FAN COOLER FANS TIME-CURRENT CHARACTERISTIC CURVES 8606160232-03

For SOUTH TEXAS PROJECT 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. LC-1

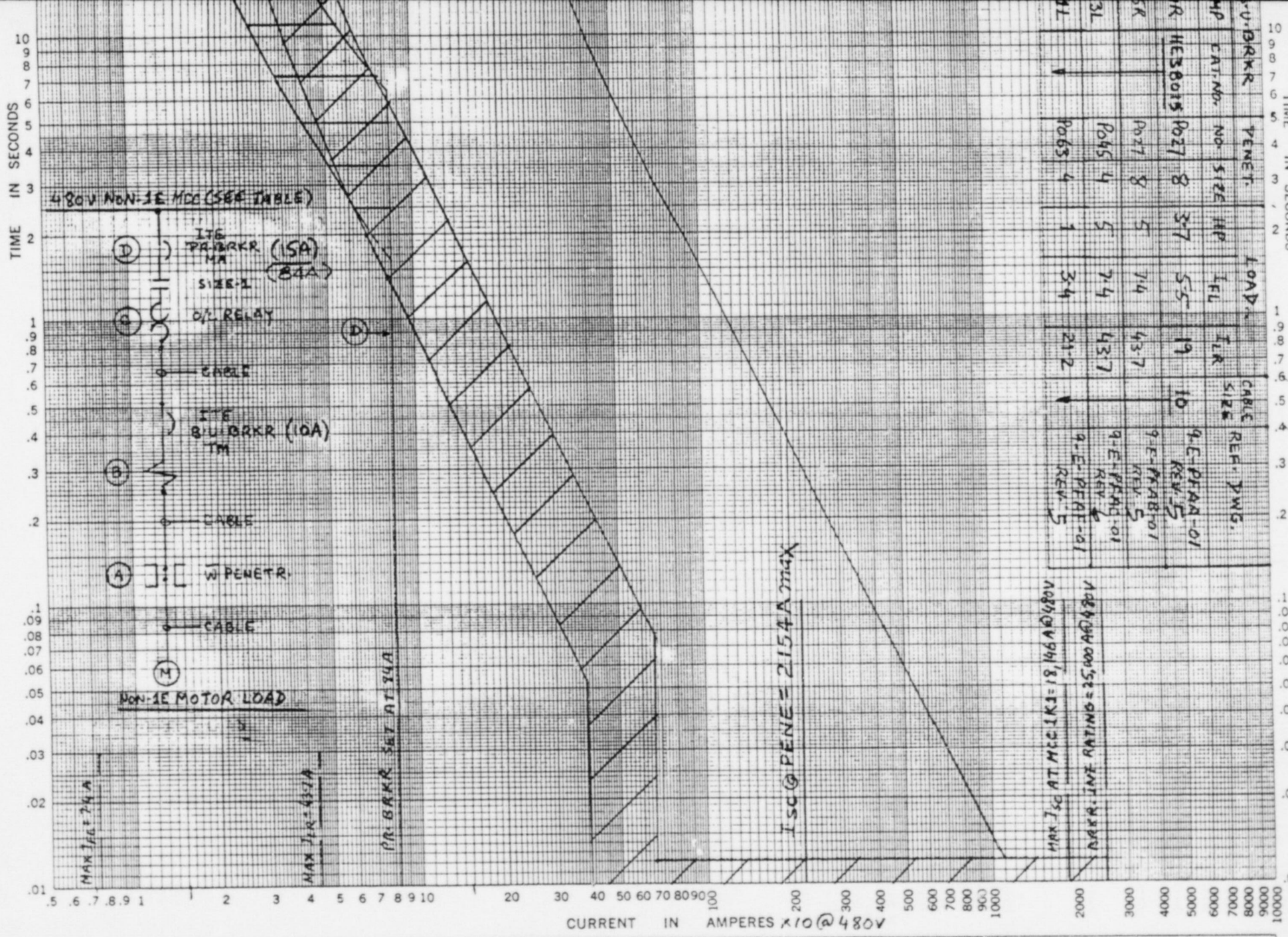
Date

CURVE NO 3

TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-03



NON 1E MCC PENET. #8 & #4 TIME-CURRENT CHARACTERISTIC CURVES 8606160232-04

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards SEE REFERENCES 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. 13

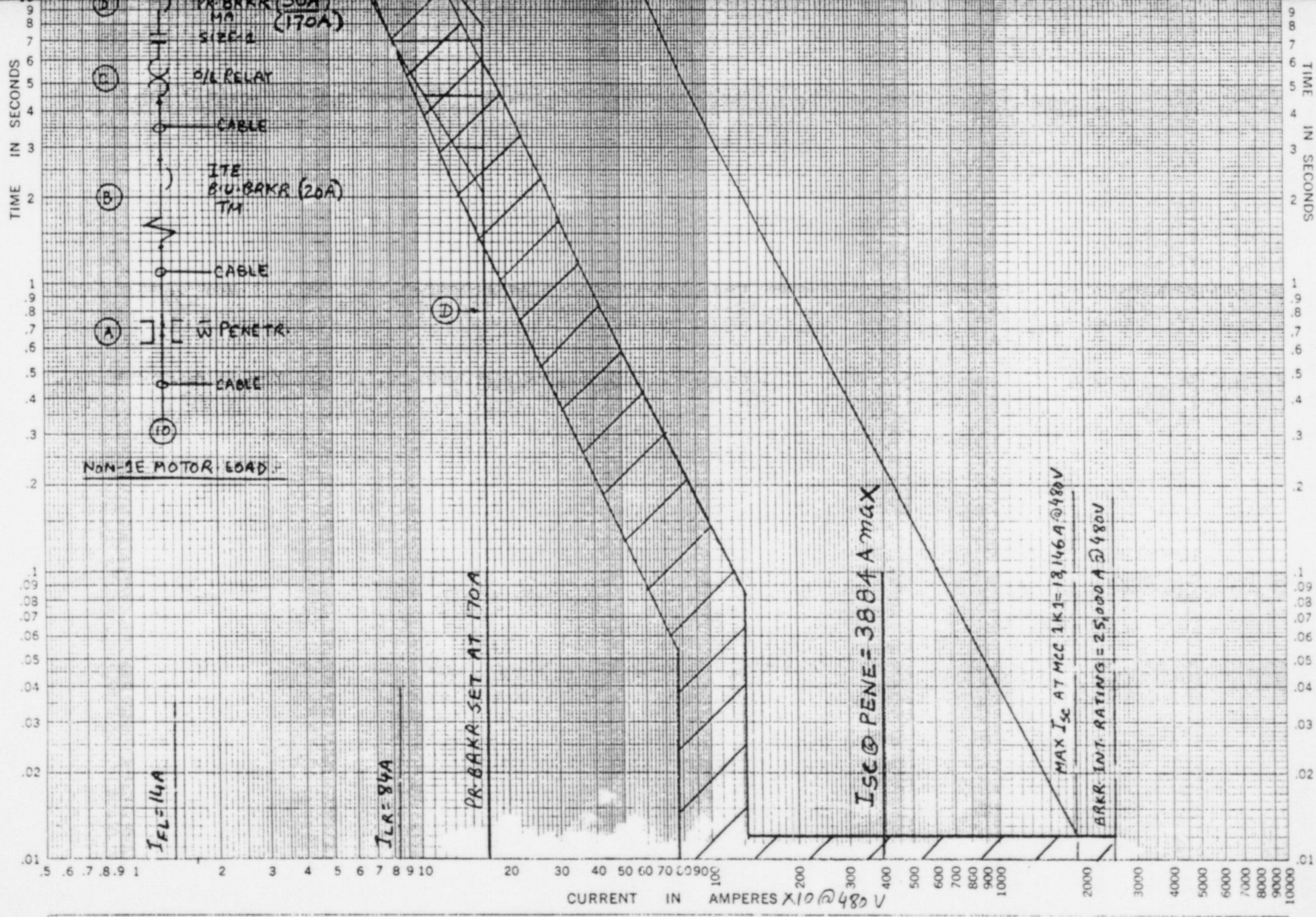
Date 11/12/85

CURVE No 4

TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-04



NON-1E MCC PENETR #8AWG TIME-CURRENT CHARACTERISTIC CURVES

8606160232-05

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards SEE REFERENCES 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. 14

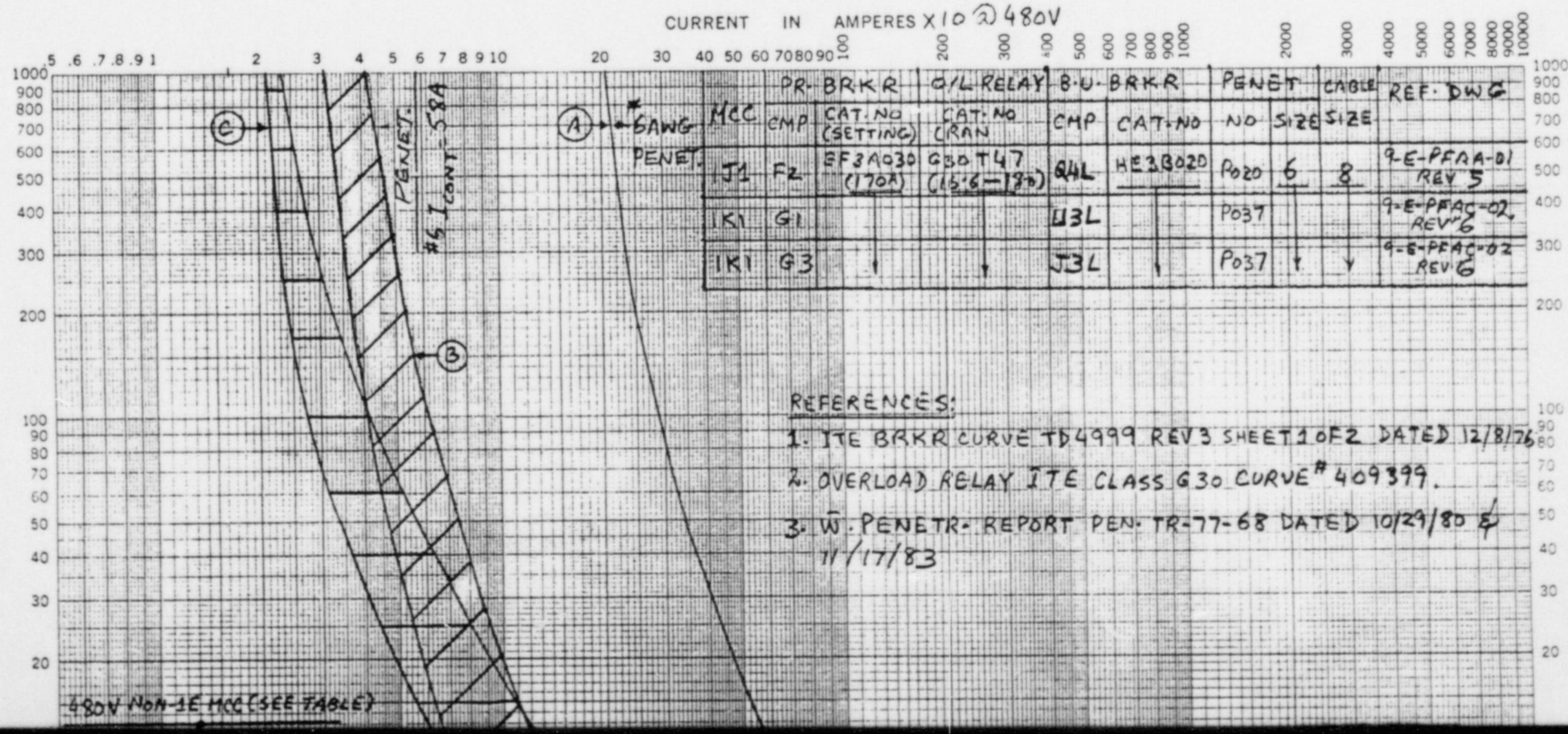
Date 11/12/85

CURVE No 5

TI
APERTURE
CARD

Also Available On
Aperture Card

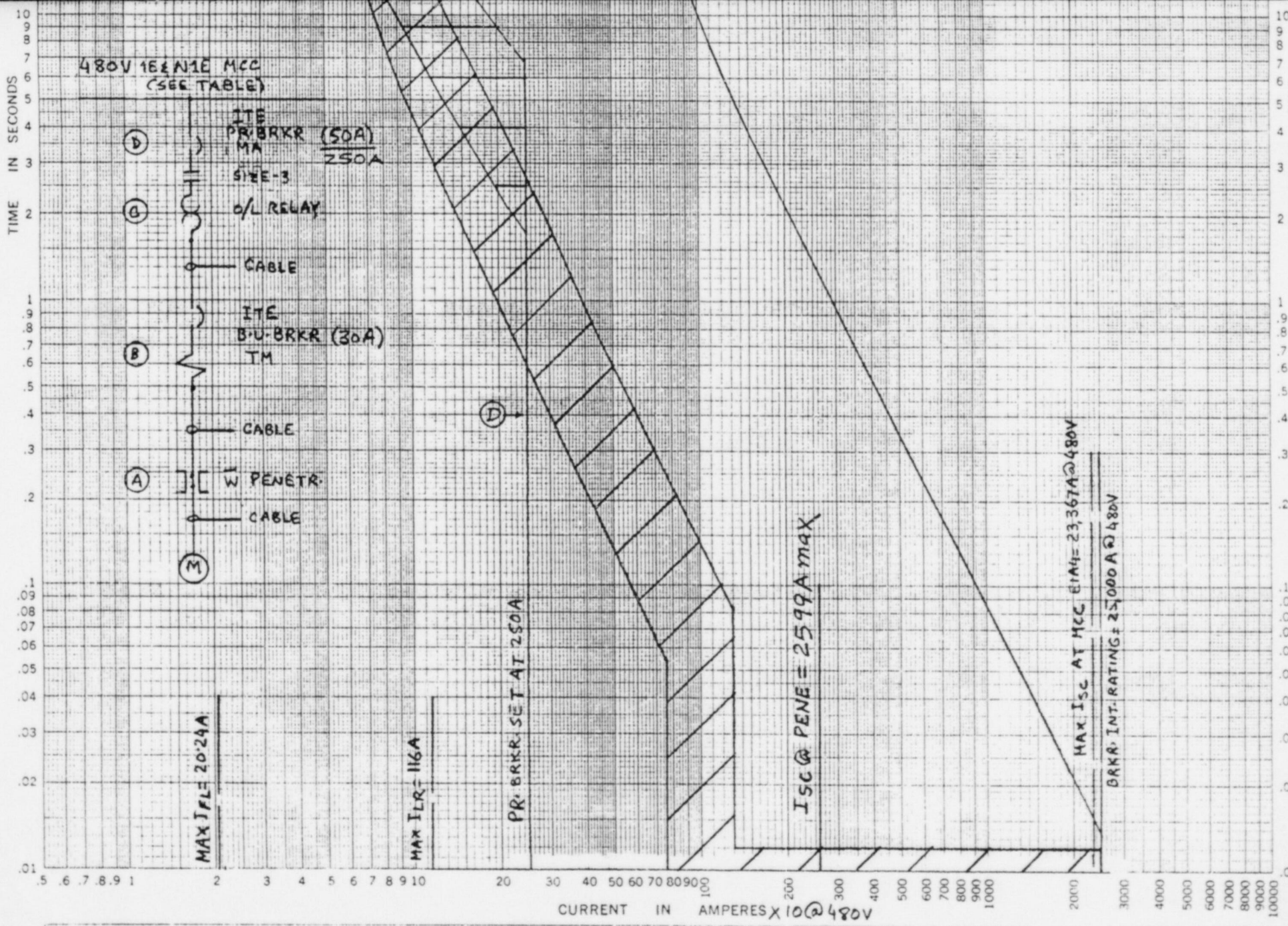
8606160232-05



MCC	PR-BRKR CMP	PR-BRKR CAT.NO (SETTING)	O/L RELAY CAT.NO (CRAN	B-U-BRKR CMP	B-U-BRKR CAT-NO	PENET NO	PENET SIZE	CABLE SIZE	REF. DWG
J1	F2	EF3A030 (170A)	G30T47 (115-170)	Q4L	HE3B020	P020	6	8	9-E-PFAA-01 REV 5
1K1	G1	↓	↓	U3L	↓	P037	↓	↓	9-E-PFAC-02, REV 6
1K1	G3	↓	↓	J3L	↓	P037	↓	↓	9-E-PFAC-02 REV 6

REFERENCES:

1. ITE BRKR CURVE TD4999 REV 3 SHEET 1 OF 2 DATED 12/8/76
2. OVERLOAD RELAY ITE CLASS G30 CURVE # 409399.
3. W. PENETR. REPORT PEN. TR-77-68 DATED 10/29/80 & 11/17/83



1E & NON-1E MCC PENET #4 & 2 AWG TIME-CURRENT CHARACTERISTIC CURVES

8606160232-06

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards SEE REFERENCES (SHEET 2) Dated —

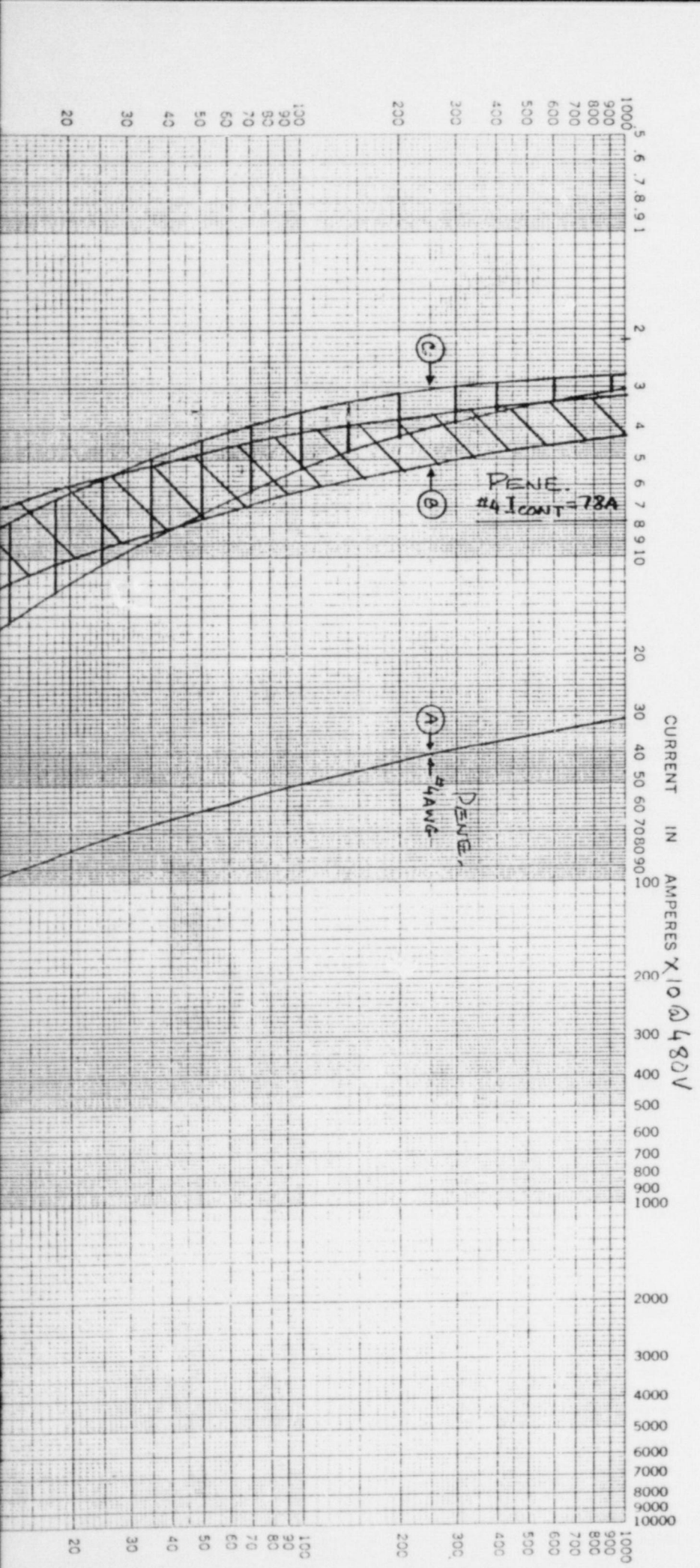
1. Tests made at Volts a-c at p-f., starting at 25C with no initial load

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

No. 15 (SHEET 1 OF 2)

Date 11/15/85

CURVE No 6



TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-06

★ CLASS 1E MCC

REFERENCES:

1. ITE BRKR CURVE TD4999 REV3 SHEET 1 OF 2 DATED 12/8/76
2. OVERLOAD RELAY ITE CLASS G30 CURVE 409399.
3. W PENETRATION REPORT PEN-TR-77-68 DATED 11/17/83.

NOTE:
SINCE PENETRATION CONDUCTOR #4 AWG IS PROTECTED THERE FORE, PENETRATION CONDUCTOR #2 AWG IS ALSO PROTECTED.

TIME IN SECONDS

CURRENT IN AMPERES

1E & NON-1E MCC PENET #4 & 2 AWG TIME-CURRENT CHARACTERISTIC CURVES

8606160232-07

For SOUTH TEXAS PROJECT Fuse Links. In –

BASIS FOR DATA Standards SEE REFERENCES ABOVE 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 CURVE NO 7

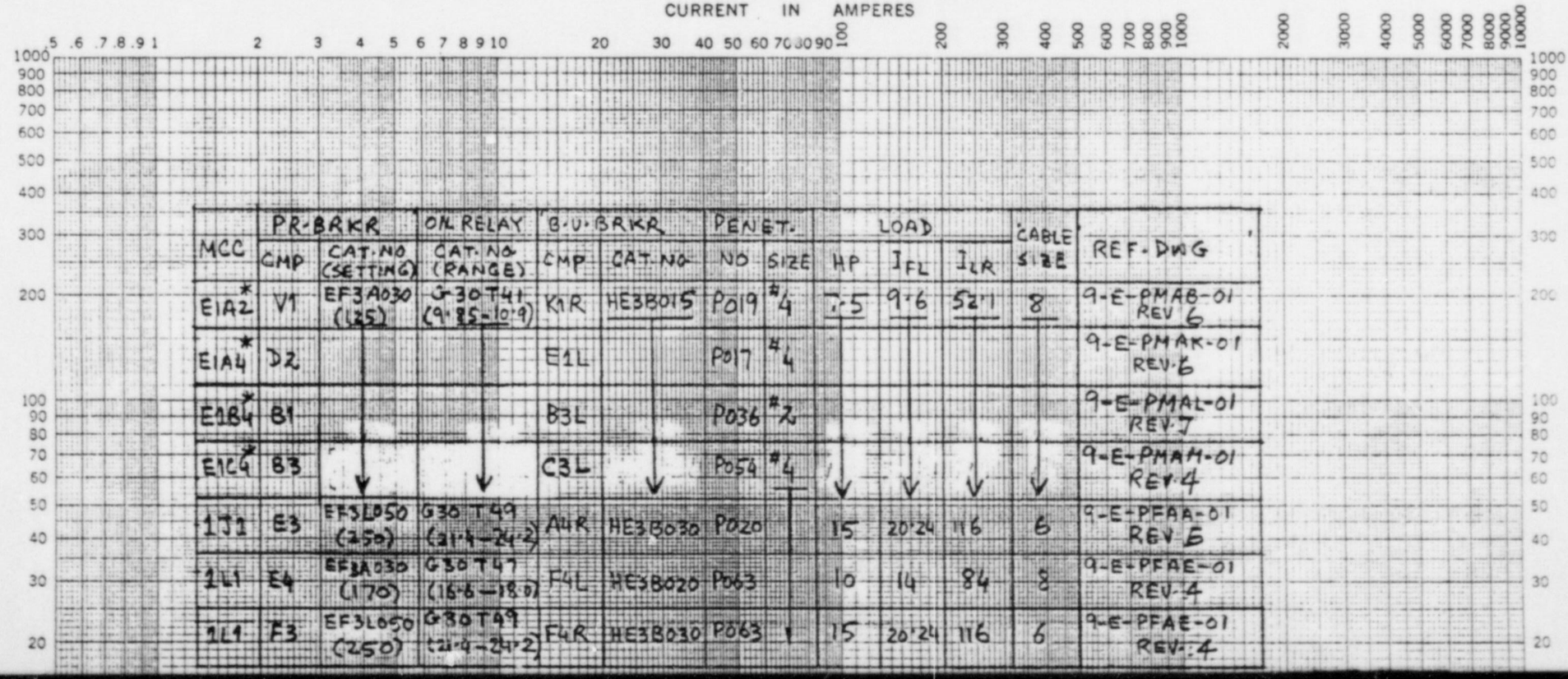
No. 15 (SHEET 2 OF 2)

Date 11/15/85

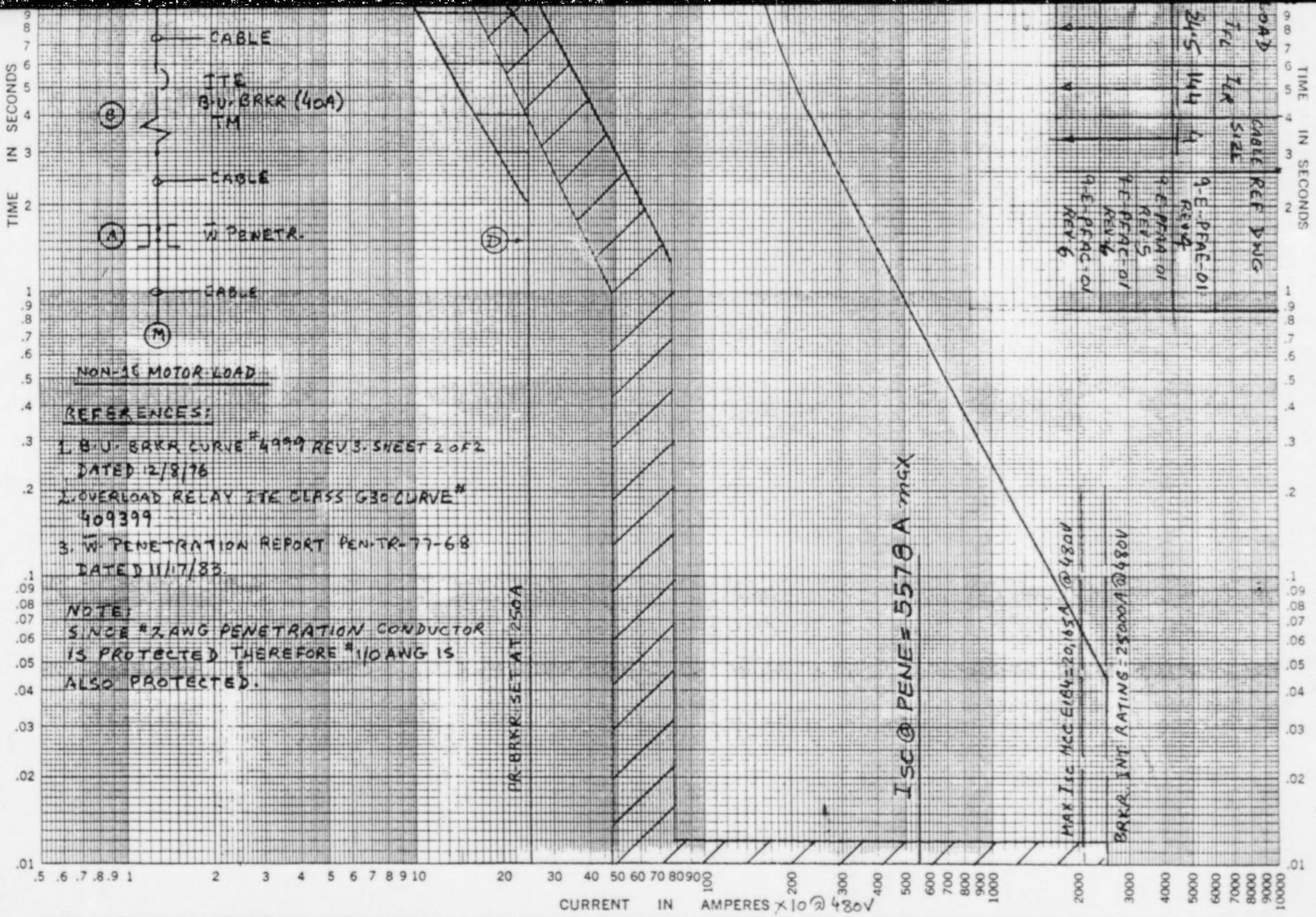
TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-07



MCC	PR-BRKR CMP	PR-BRKR CAT. NO (SETTING)	OL RELAY CAT. NO (RANGE)	B-U-BRKR CMP	B-U-BRKR CAT. NO	PENET. NO	PENET. SIZE	LOAD HP	LOAD I_{FL}	LOAD I_{LR}	CABLE SIZE	REF. DWG
E1A2*	V1	EF3A030 (135)	G30T41 (9.85-10.9)	K1R	HE3B015	P019	#4	7.5	9.6	52.1	8	9-E-PMAB-01 REV 6
E1A4*	D2			E1L		P017	#4					9-E-PMAK-01 REV.6
E1B4*	B1			B3L		P036	#2					9-E-PMAL-01 REV.7
E1C4*	B3			C3L		P054	#4					9-E-PMAM-01 REV.4
1J1	E3	EF3L050 (250)	G30T49 (21.4-24.2)	A4R	HE3B030	P020		15	20.24	116	6	9-E-PFAA-01 REV 5
1L1	E4	EF3A030 (170)	G30T47 (16.6-18.0)	F4L	HE3B020	P063		10	14	84	8	9-E-PFAE-01 REV.4
1L1	F3	EF3L050 (250)	G30T49 (21.4-24.2)	F4R	HE3B030	P063	1	15	20.24	116	6	9-E-PFAE-01 REV.4



NON-1E MCC PENET # 2 & 1/0 AWG TIME-CURRENT CHARACTERISTIC CURVES

8606160232-08

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards SEE REFERENCES 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. 16

Date 11/2/85

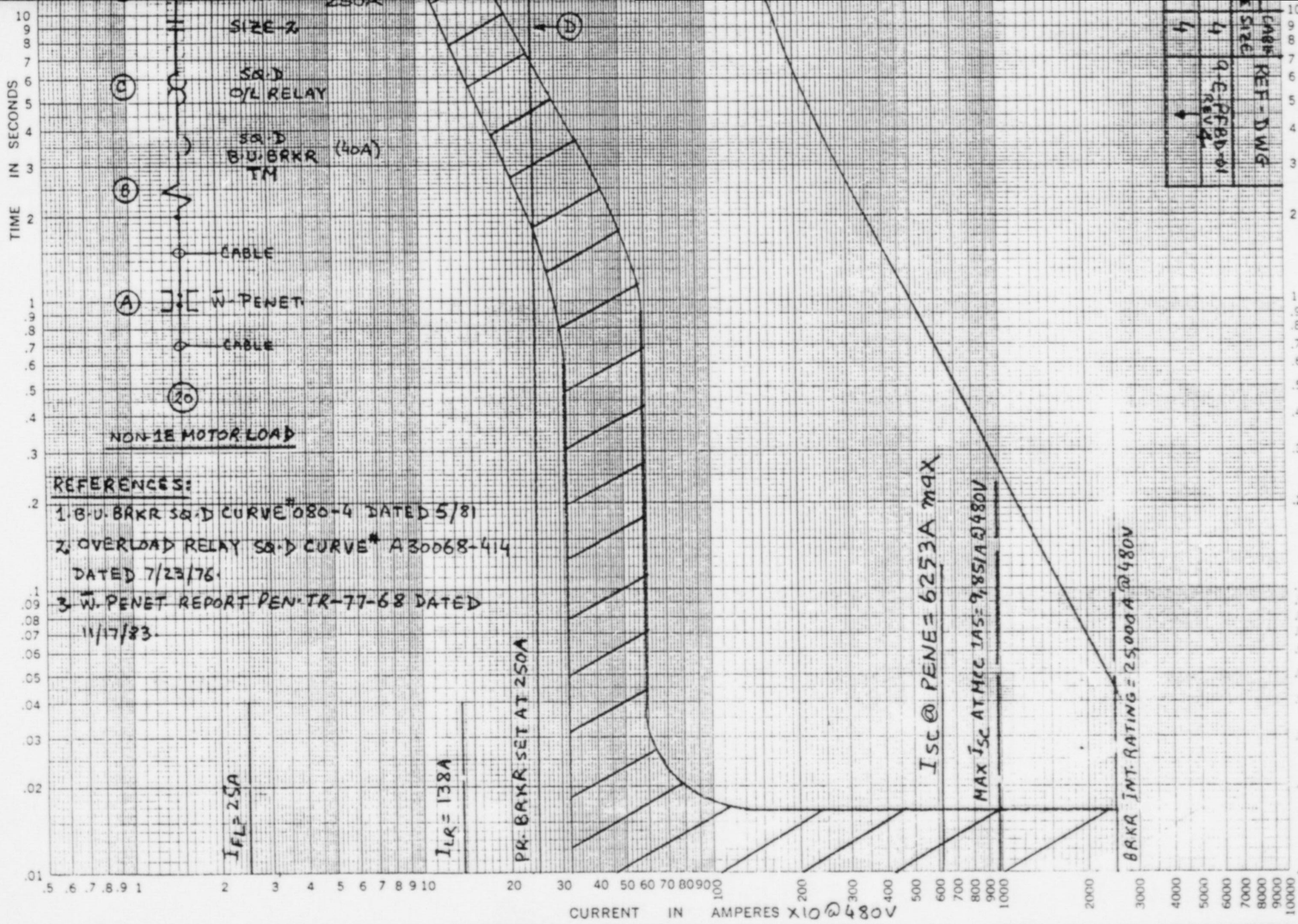
CURVE NO 8

CALC NO EC-5025, REV. 0

TI
APERTURE
CARD

Also Available On
Aperture Card

8006160232-08



NON-1E MCC PENET. #2 AWG TIME-CURRENT CHARACTERISTIC CURVES 8606160232-09

For SOUTH TEXAS PROJECT Fuse Links. In -

BASIS FOR DATA Standards SEE REFERENCES ABOVE 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. 17

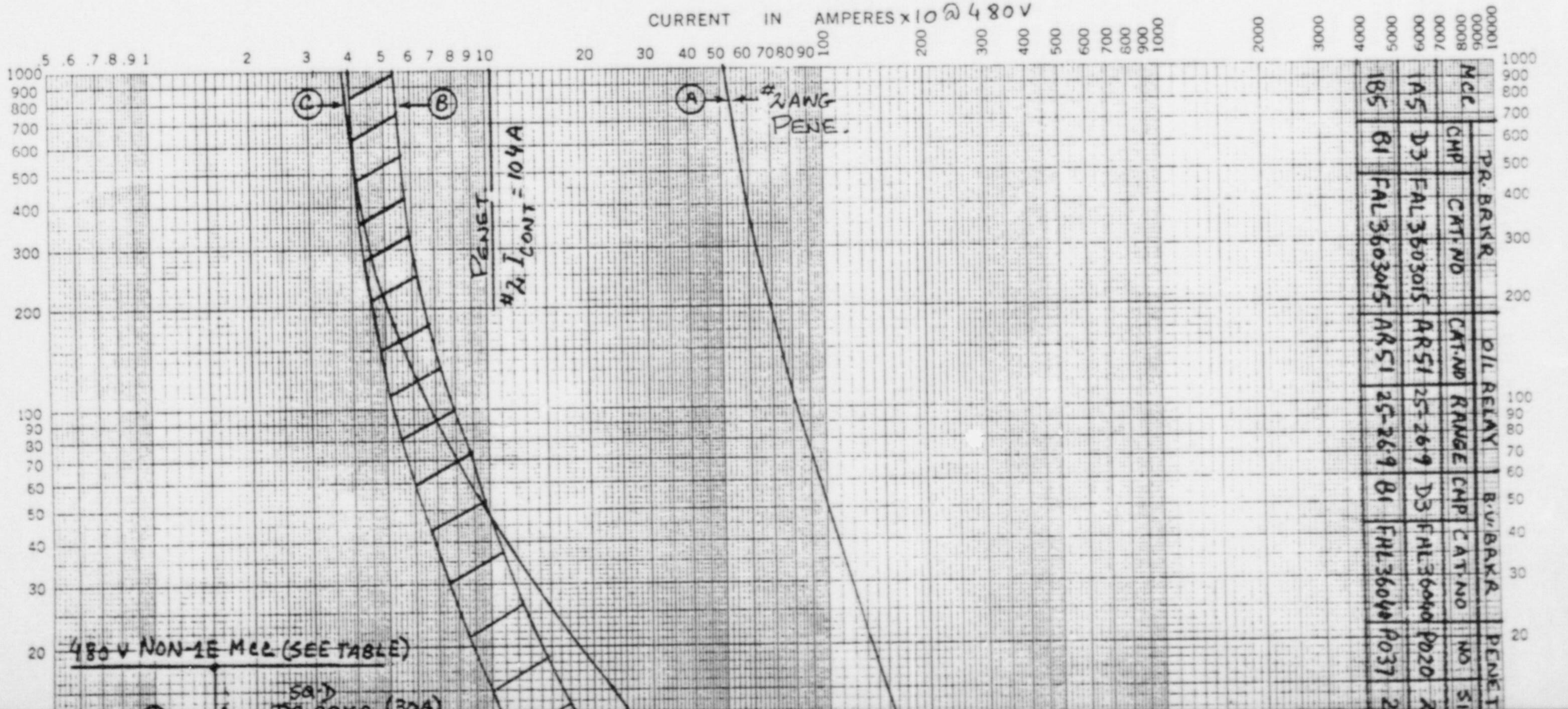
Date 11/14/85

CURVE No 9

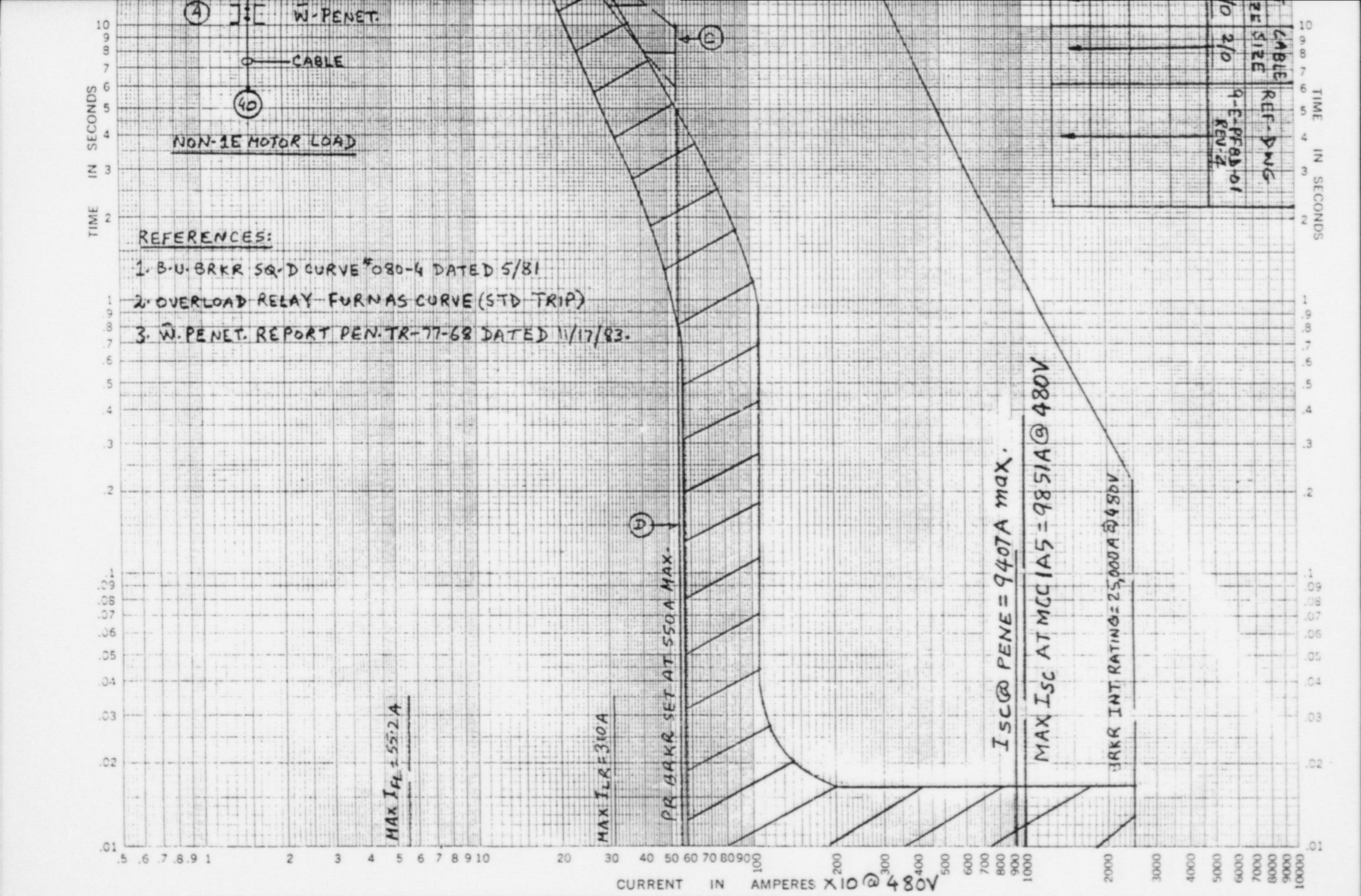
TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-09



MCC	PR. BRKR		O/L RELAY		B.U. BRKR		PENET	
	CMP	CAT. NO	CAT. NO	RANGE	CMP	CAT. NO	NO	SI
1A5	D3	FAL3603015	AR51	25-26.9	D3	FAL36040	P020	2
1B5	B1	FAL3603015	AR51	25-26.9	B1	FHL36040	P037	2



NON-1E MCC PENET # 3/0 AWG TIME-CURRENT CHARACTERISTIC CURVES

8606160232-10

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards SEE REFERENCES ABOVE 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. 18

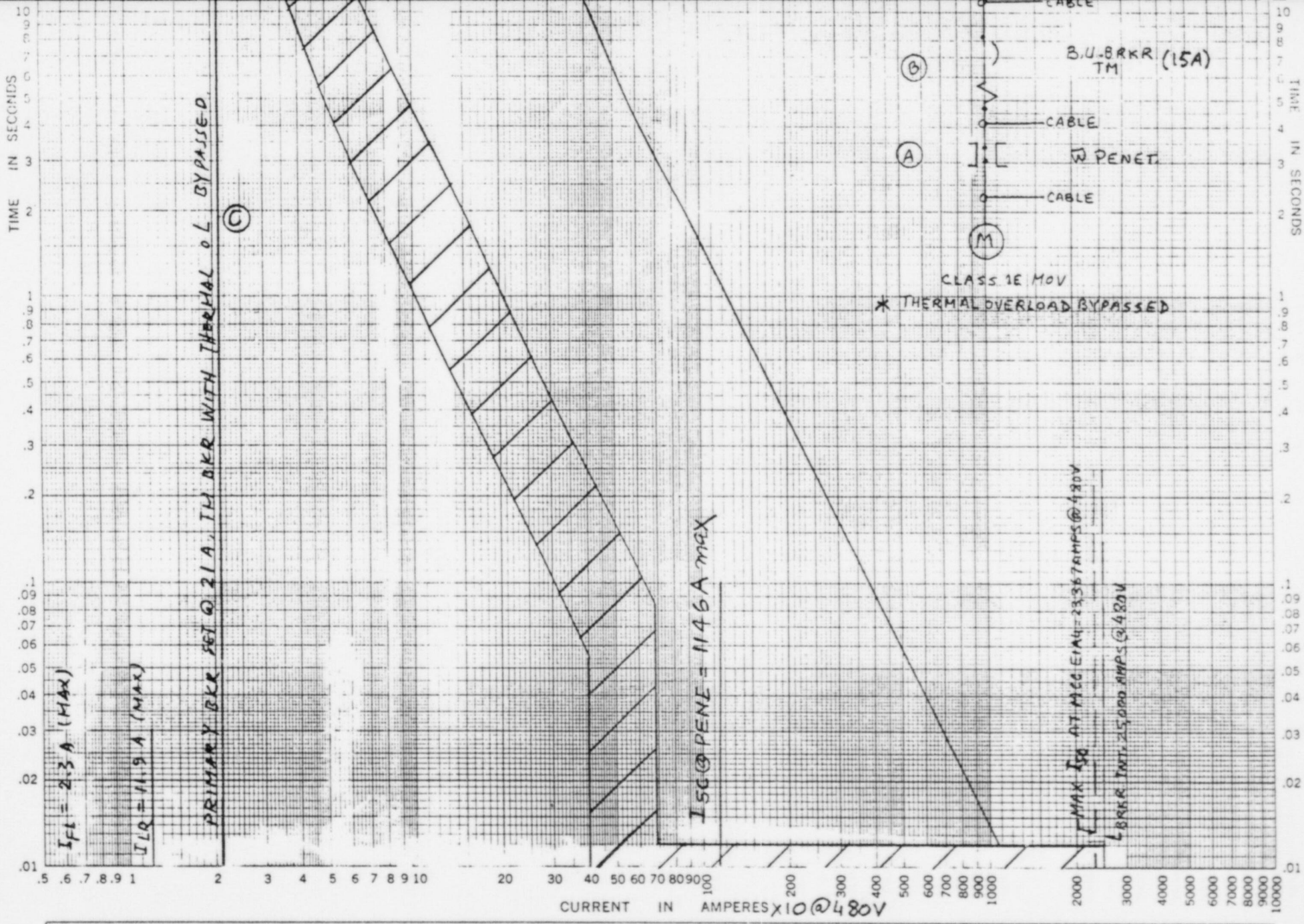
Date 11/14/85

CURVE NO 10

TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-10



1E MCC PENET. #8, 6 & 4 TIME-CURRENT CHARACTERISTIC CURVES 8606160232-11

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards SEE REFERENCES 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. 7, SHEET 1 OF 7

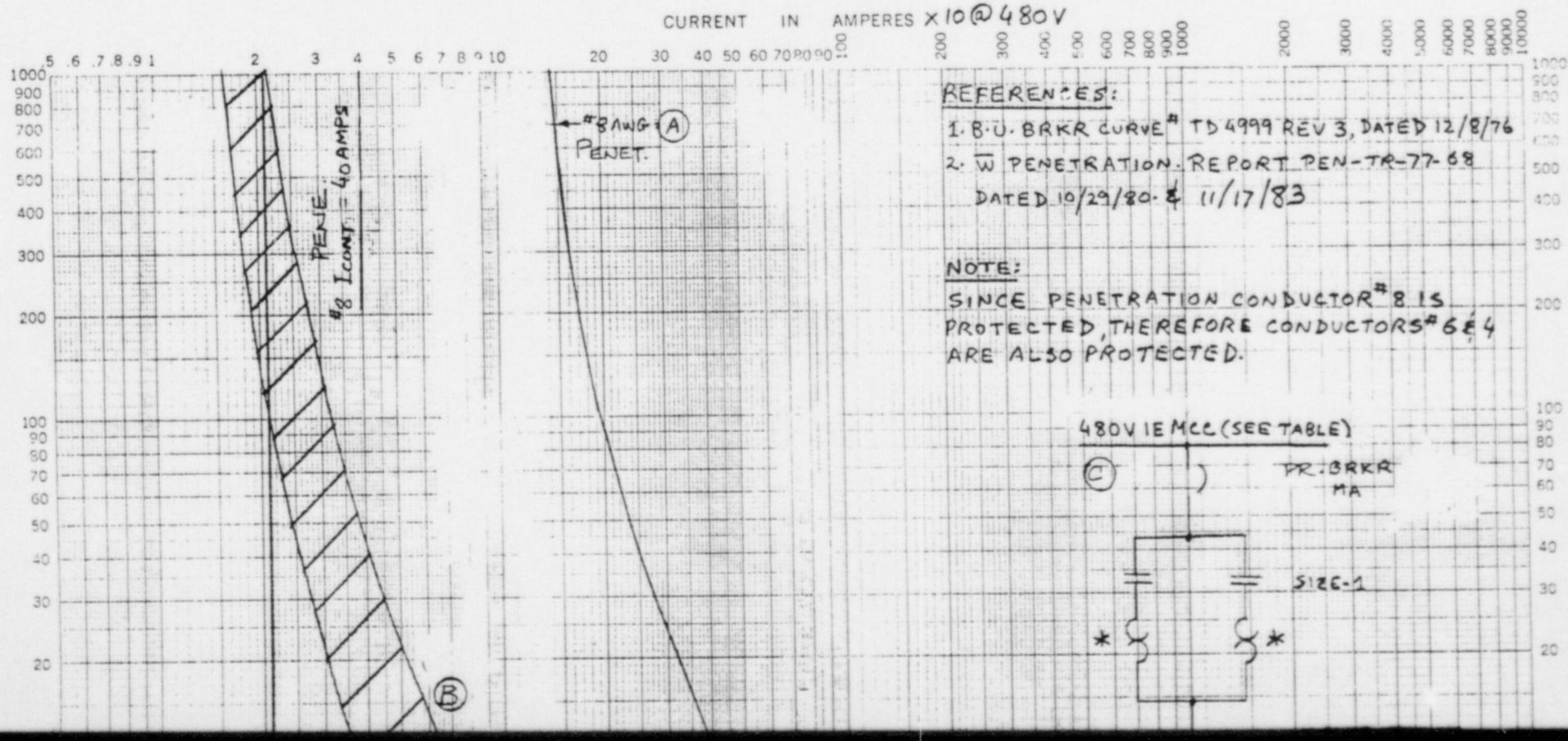
Date 10/21/85

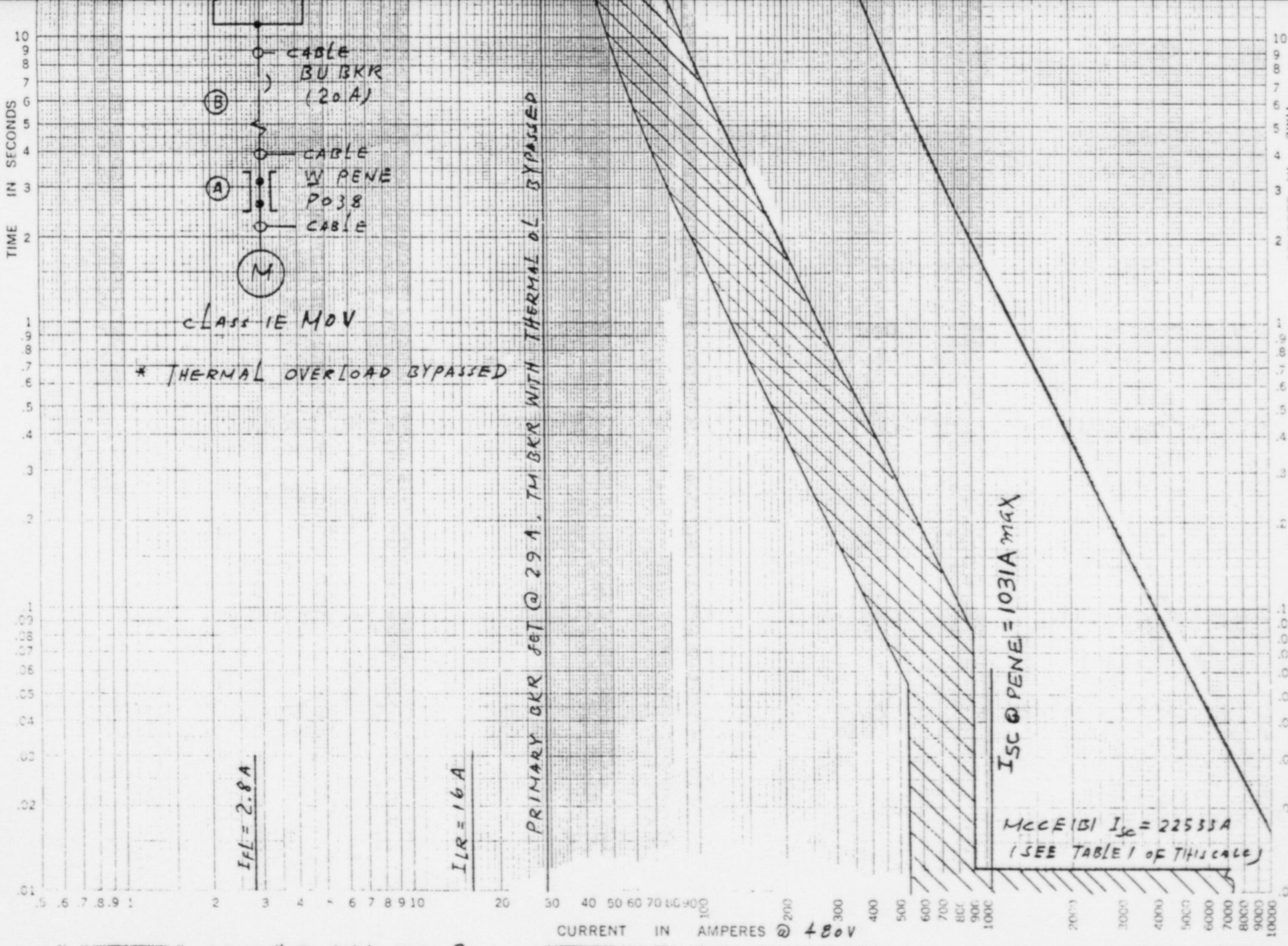
CURVE No 11

TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-11





1EMCC PENE # 8 AN4 FOR 20A TH BKR

TIME-CURRENT CHARACTERISTIC CURVES

8606160232-12

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards SEE REFERENCES 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

CURVE NO 12

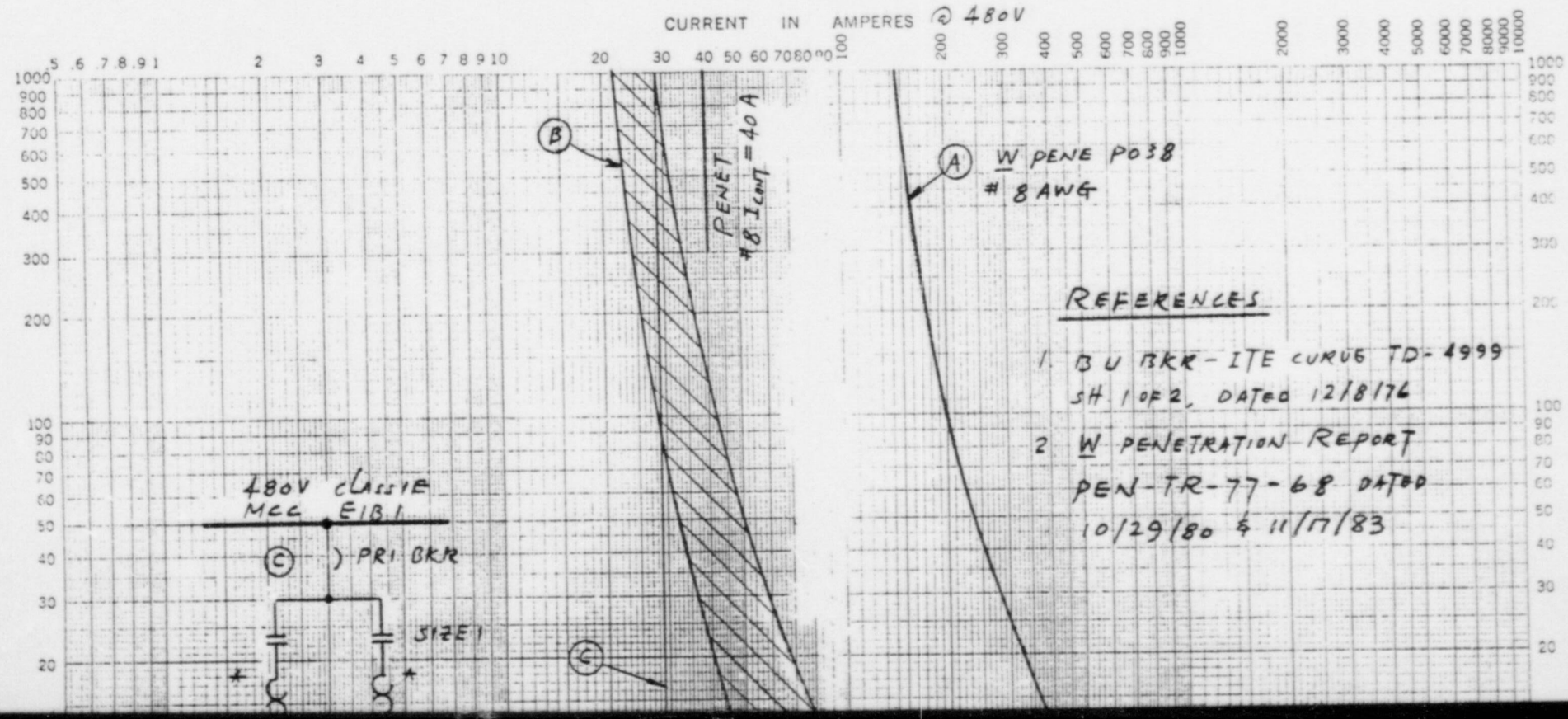
No. 7 SHEET 2 OF 7

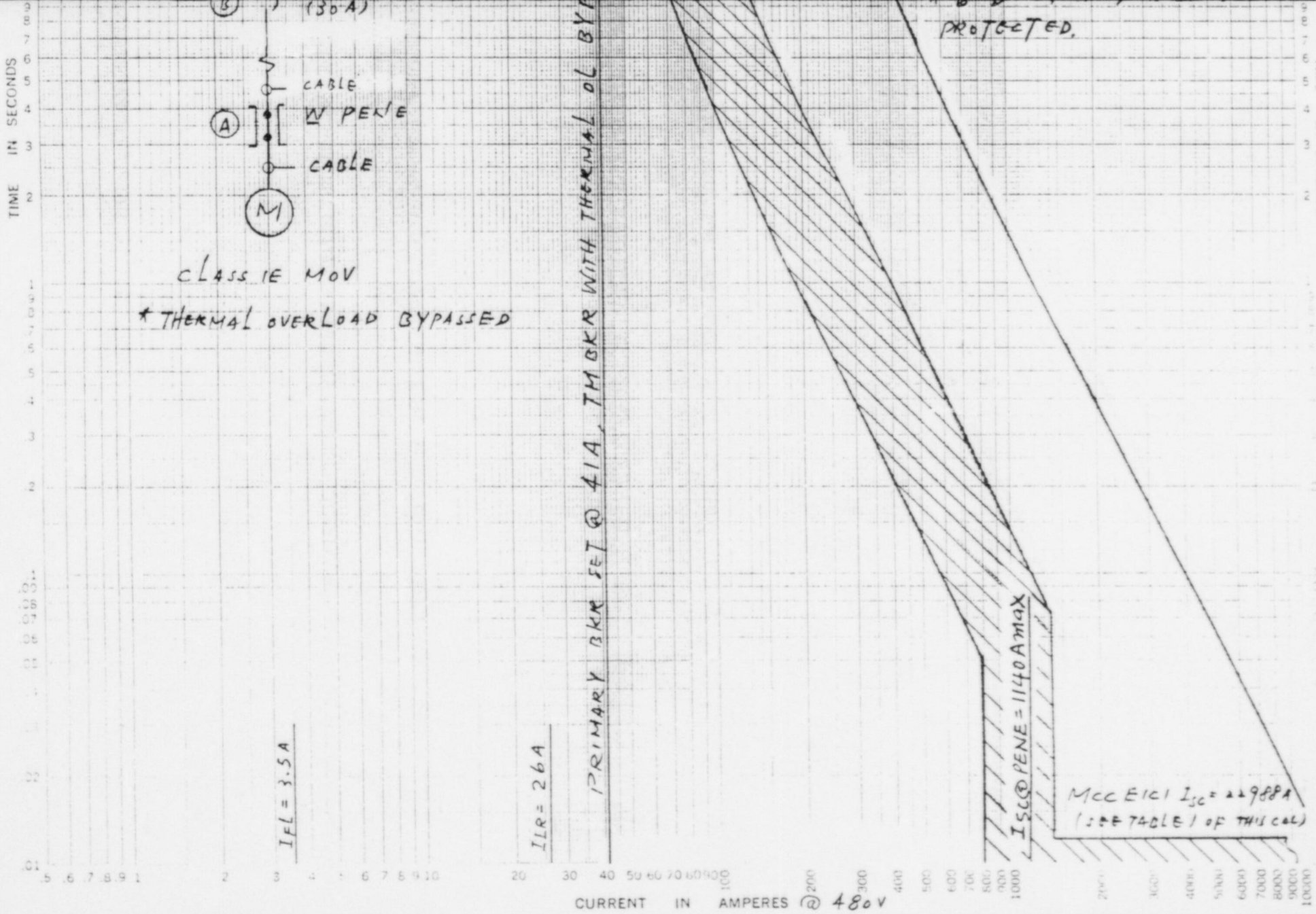
Date 12/12/85

TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-12





1E MCC PENE * 8 AWG FOR 30A TM BKR

TIME-CURRENT CHARACTERISTIC CURVES 8606160232-13

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards SEE REFERENCES 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. 7 SHEET 3 OF 7

Date

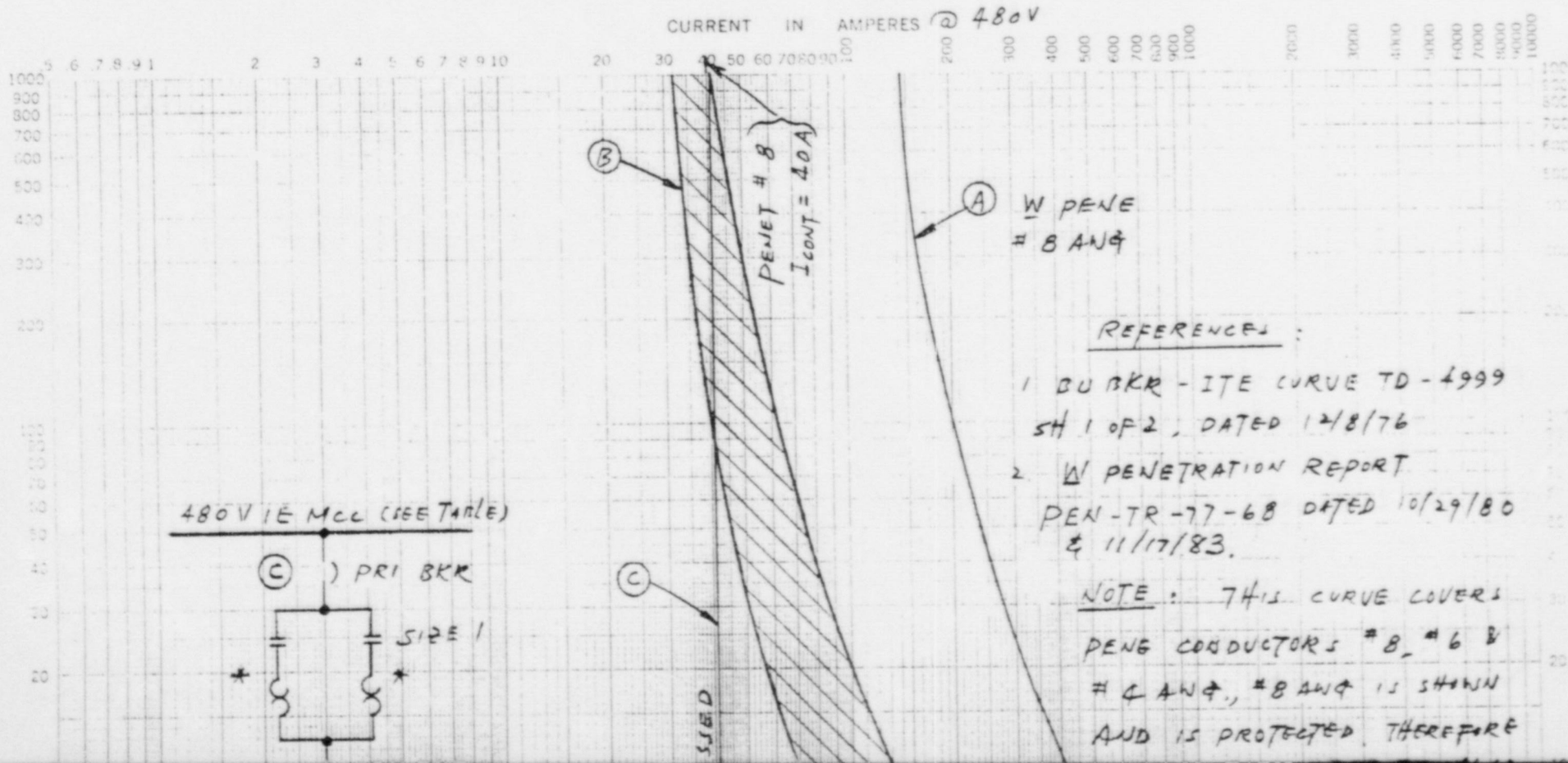
CURVE NO 13

CALC. NO EC 5025, REV. 0

TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-13

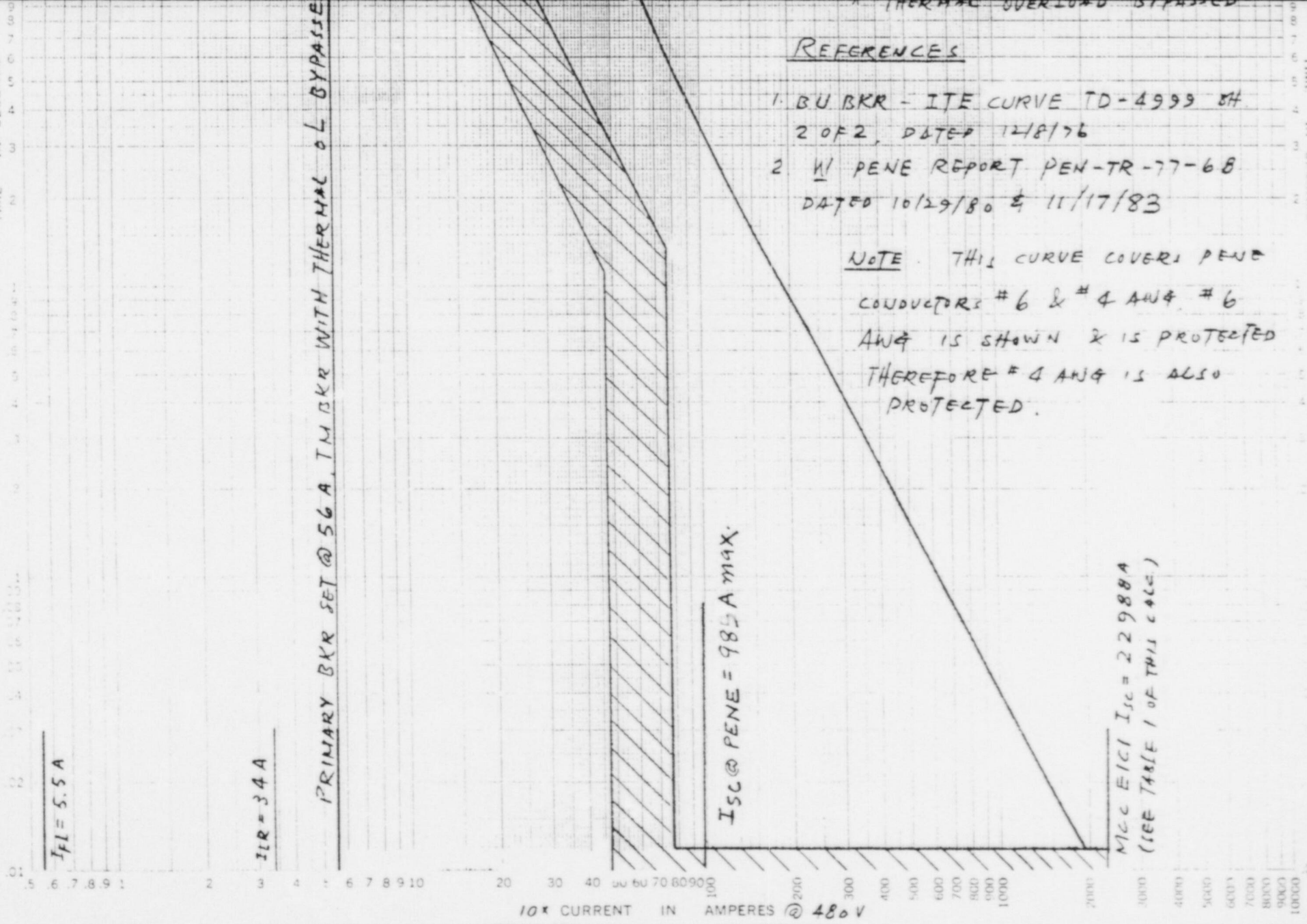


REFERENCES:

1 BU BKR - ITE CURVE TD-4999 SH 1 OF 2, DATED 12/8/76

2 W PENETRATION REPORT PEN-TR-77-68 DATED 10/29/80 & 11/17/83.

NOTE: THIS CURVE COVERS PENE CONDUCTORS #8, #6 & #4 AWG., #8 AWG IS SHOWN AND IS PROTECTED. THEREFORE



REFERENCES

1. BU BKR - ITE CURVE TD-4999 SH 2 OF 2, DATED 12/8/76
2. W PENE REPORT PEN-TR-77-68 DATED 10/29/80 & 11/17/83

NOTE. THIS CURVE COVERS PENE CONDUCTORS #6 & #4 AWG. #6 AWG IS SHOWN & IS PROTECTED THEREFORE #4 AWG IS ALSO PROTECTED.

IEMCC PENE #6 AWG FOR 40A TM BKR

TIME-CURRENT CHARACTERISTIC CURVES

8606160232-14

For SOUTH TEXAS PROJECT

Fuse Links. In

BASIS FOR DATA Standards SEE REFERENCES 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. 7 SHEET 4 OF 7

Date

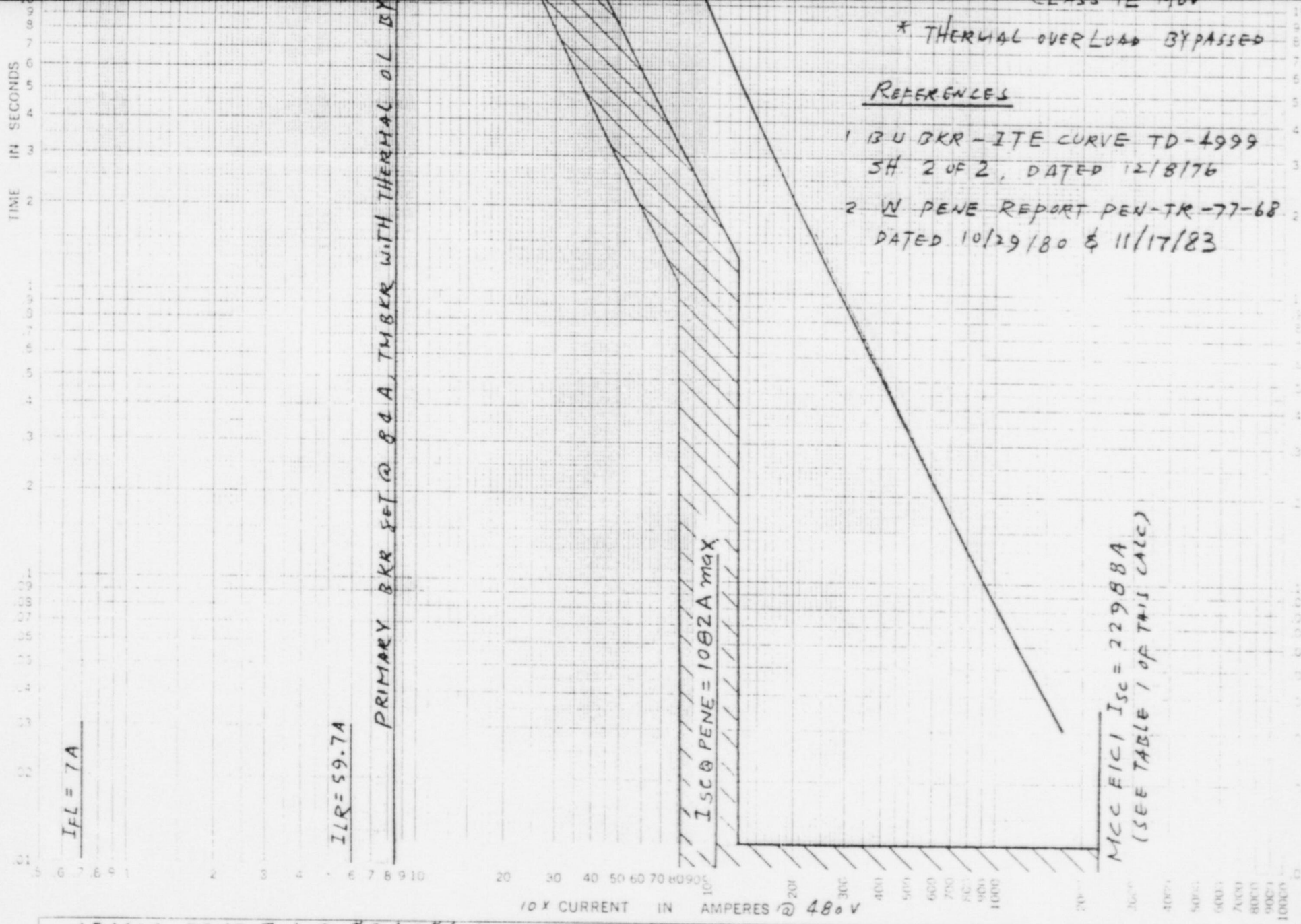
CURVE NO 14

CALC. NO. EC 5025, REV. 0

TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-14



1EMCC PENE # 4, 2-#8 & 2-#6 4W4 FOR 70 A TM BKR

For SOUTH TEXAS PROJECT — TIME-CURRENT CHARACTERISTIC CURVES — 8606160232-15

Fuse Links. In

BASIS FOR DATA Standards SEE REFERENCES 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. 7, SHEET 5 OF 7

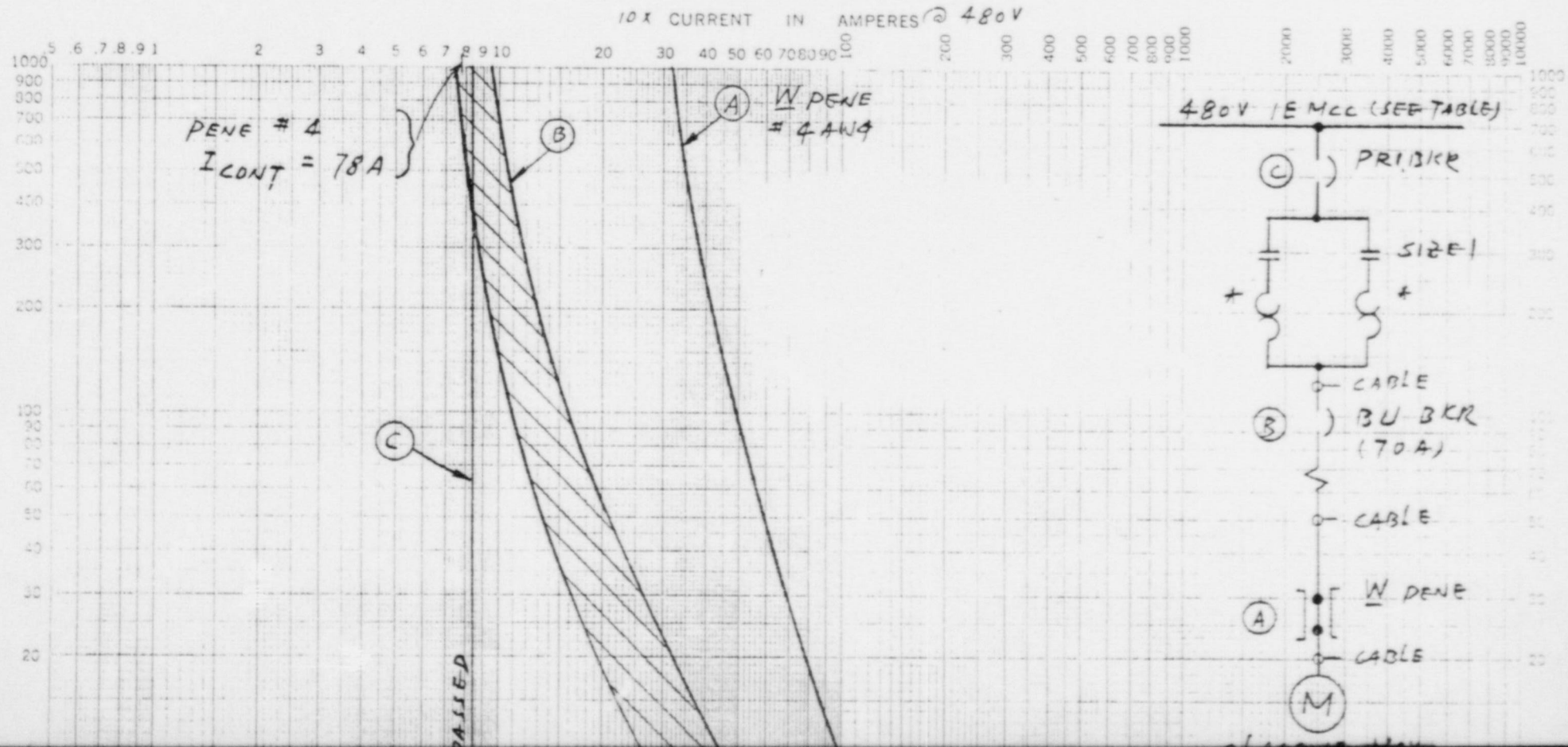
Date

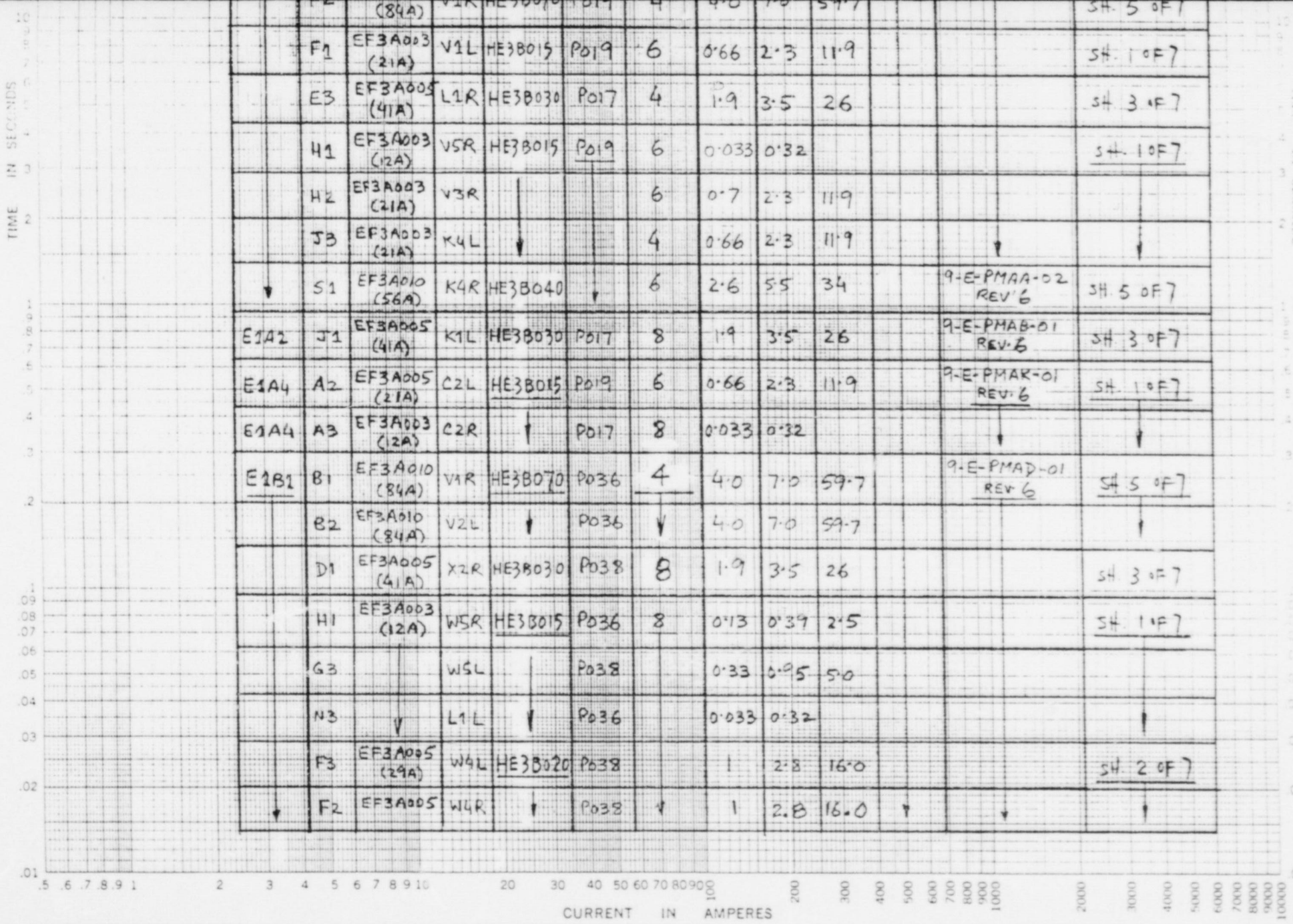
FIDVF R/O 15

TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-15





		(84A)	V1R	HE3B070	P019	4	4.0	7.0	59.7			SH. 5 OF 7
	F1	EF3A003 (21A)	V1L	HE3B015	P019	6	0.66	2.3	11.9			SH. 1 OF 7
	E3	EF3A005 (41A)	L1R	HE3B030	P017	4	1.9	3.5	26			SH 3 OF 7
	H1	EF3A003 (12A)	V5R	HE3B015	P019	6	0.033	0.32				SH. 1 OF 7
	H2	EF3A003 (21A)	V3R			6	0.7	2.3	11.9			
	J3	EF3A003 (21A)	K4L			4	0.66	2.3	11.9			
	S1	EF3A010 (56A)	K4R	HE3B040		6	2.6	5.5	34		9-E-PMAA-02 REV 6	SH 5 OF 7
E1A2	J1	EF3A005 (41A)	K1L	HE3B030	P017	8	1.9	3.5	26		9-E-PMAB-01 REV. 6	SH 3 OF 7
E1A4	A2	EF3A005 (21A)	C2L	HE3B015	P019	6	0.66	2.3	11.9		9-E-PMAK-01 REV. 6	SH. 1 OF 7
E1A4	A3	EF3A003 (12A)	C2R		P017	8	0.033	0.32				
E1B1	B1	EF3A010 (84A)	V1R	HE3B070	P036	4	4.0	7.0	59.7		9-E-PMAD-01 REV 6	SH 5 OF 7
	B2	EF3A010 (84A)	V2L		P036		4.0	7.0	59.7			
	D1	EF3A005 (41A)	X2R	HE3B030	P038	8	1.9	3.5	26			SH 3 OF 7
	H1	EF3A003 (12A)	W5R	HE3B015	P036	8	0.13	0.39	2.5			SH. 1 OF 7
	G3		W5L		P038		0.33	0.95	5.0			
	N3		L1L		P036		0.033	0.32				
	F3	EF3A005 (29A)	W4L	HE3B020	P038		1	2.8	16.0			SH 2 OF 7
	F2	EF3A005	W4R		P038		1	2.8	16.0			

1E MCC PENET. #8, 6, & 4 TIME-CURRENT CHARACTERISTIC CURVES **8606160232-16**

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards SEE REFERENCES (SHEET 2) 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. 7, SHEET 6 OF 7

Date 10/21/85

FIDUCIAL NO 16

TI
APERTURE
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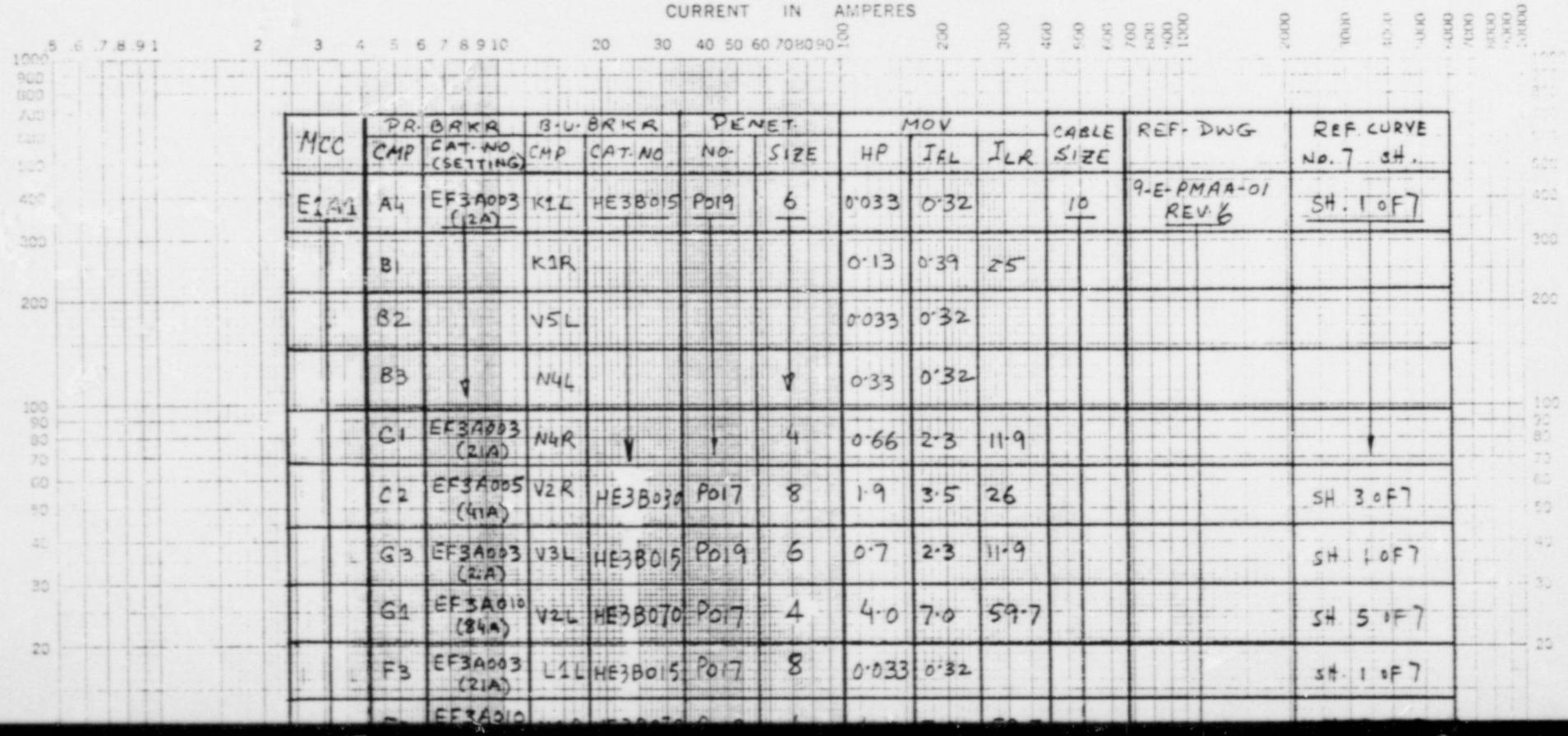
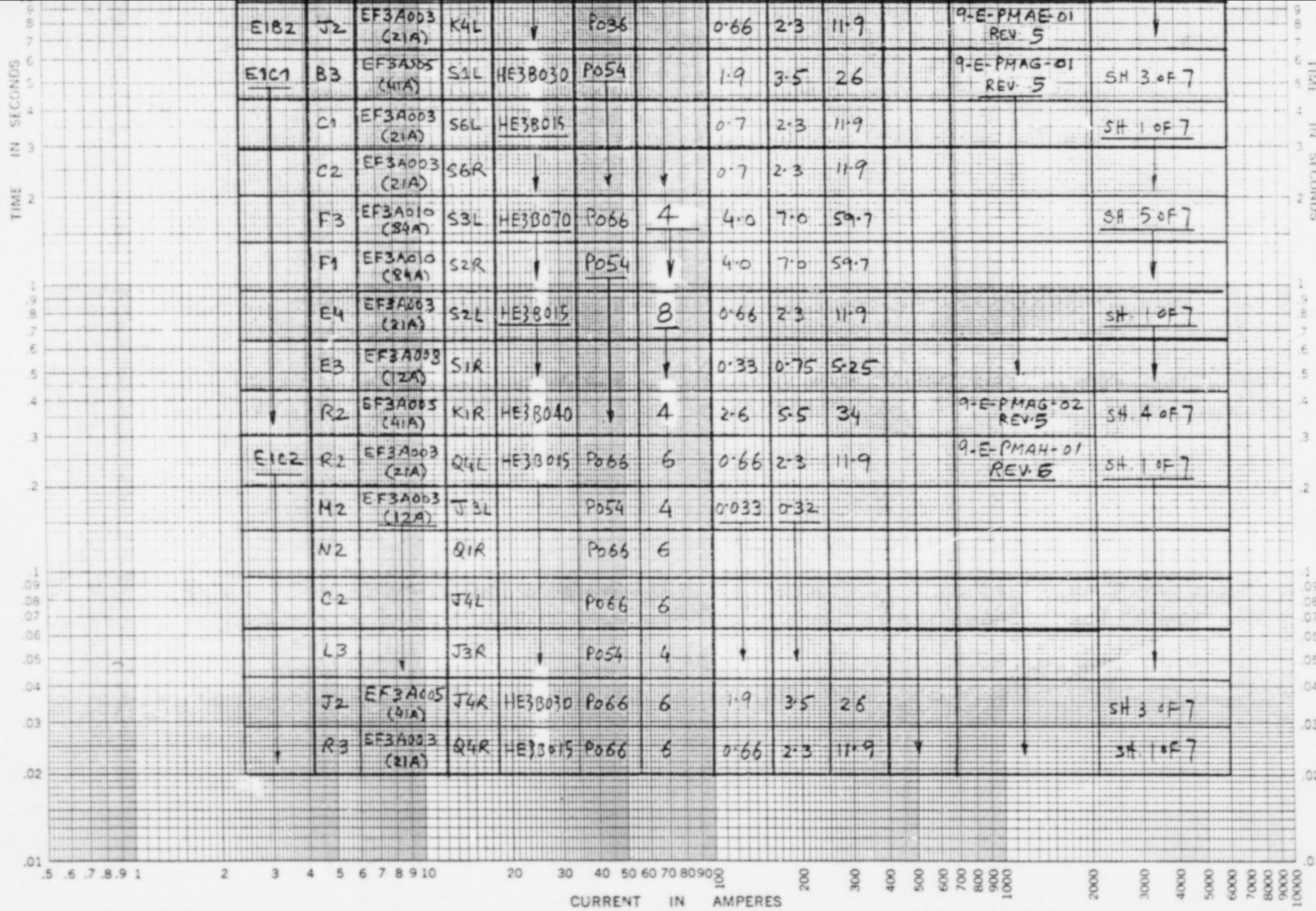
Also Available On
Aperture Card

8606160232-16



MCC	PR. BRKR CMP	PR. BRKR CAT. NO (SETTING)	B-U BRKR CMP	B-U BRKR CAT. NO	PENET. NO.	PENET. SIZE	MOV HP	MOV IFL	MOV ILR	CABLE SIZE	REF. DWG	REF. CURVE No. 7 SH.
E1A1	A4	EF3A003 (12A)	K1L	HE3B015	P019	6	0·033	0·32		10	9-E-PMAA-01 REV 6	SH. 1 OF 7
	B1		K1R				0·13	0·39	25			
	B2		V5L				0·033	0·32				
	B3		N4L				0·33	0·32				
	C1	EF3A003 (21A)	N4R			4	0·66	2·3	11·9			
	C2	EF3A005 (41A)	V2R	HE3B030	P017	8	1·9	3·5	26			SH 3 OF 7
	G3	EF3A003 (2·A)	V3L	HE3B015	P019	6	0·7	2·3	11·9			SH 1 OF 7
	G1	EF3A010 (84A)	V2L	HE3B070	P017	4	4·0	7·0	59·7			SH 5 OF 7
	F3	EF3A003 (21A)	L1L	HE3B015	P017	8	0·033	0·32				SH. 1 OF 7
		EF3A010										



E182	J2	EF3A003 (21A)	K4L	↓	P036		0.66	2.3	11.9		9-E-PMAE-01 REV. 5	↓
E1C1	B3	EF3A005 (41A)	S1L	HE3B030	P054		1.9	3.5	26		9-E-PMAG-01 REV. 5	SH 3 OF 7
	C1	EF3A003 (21A)	S6L	HE3B015			0.7	2.3	11.9			SH 1 OF 7
	C2	EF3A003 (21A)	S6R	↓	↓	↓	0.7	2.3	11.9			↓
	F3	EF3A010 (84A)	S3L	HE3B070	P066	4	4.0	7.0	59.7			SH 5 OF 7
	F1	EF3A010 (84A)	S2R	↓	P054	↓	4.0	7.0	59.7			↓
	E4	EF3A003 (21A)	S2L	HE3B015		8	0.66	2.3	11.9			SH 1 OF 7
	E3	EF3A008 (12A)	S1R	↓		↓	0.33	0.75	5.25		1	↓
↓	R2	EF3A005 (41A)	K1R	HE3B040	↓	4	2.6	5.5	34		9-E-PMAG-02 REV.5	SH. 4 OF 7
E1C2	R2	EF3A003 (21A)	Q4L	HE3B015	P066	6	0.66	2.3	11.9		9-E-PMAH-01 REV. 6	SH. 1 OF 7
	H2	EF3A003 (12A)	J3L		P054	4	0.033	0.32				
	N2		Q1R		P066	6						
	C2		J4L		P066	6						
	L3	↓	J3R	↓	P054	4	↓	↓				↓
	J2	EF3A005 (41A)	J4R	HE3B030	P066	6	1.9	3.5	26			SH 3 OF 7
↓	R3	EF3A003 (21A)	Q4R	HE3B015	P066	6	0.66	2.3	11.9	↓	↓	SH 1 OF 7

1E MCC PENET. #8, 6, & 4 TIME-CURRENT CHARACTERISTIC CURVES

8606160232-17

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards SEE REFERENCES (SHEET 2) 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. 7, SHEET 7 OF 7

Date 10/21/85

CURVE NO 17

CALC. NO EC5025, REV. 0

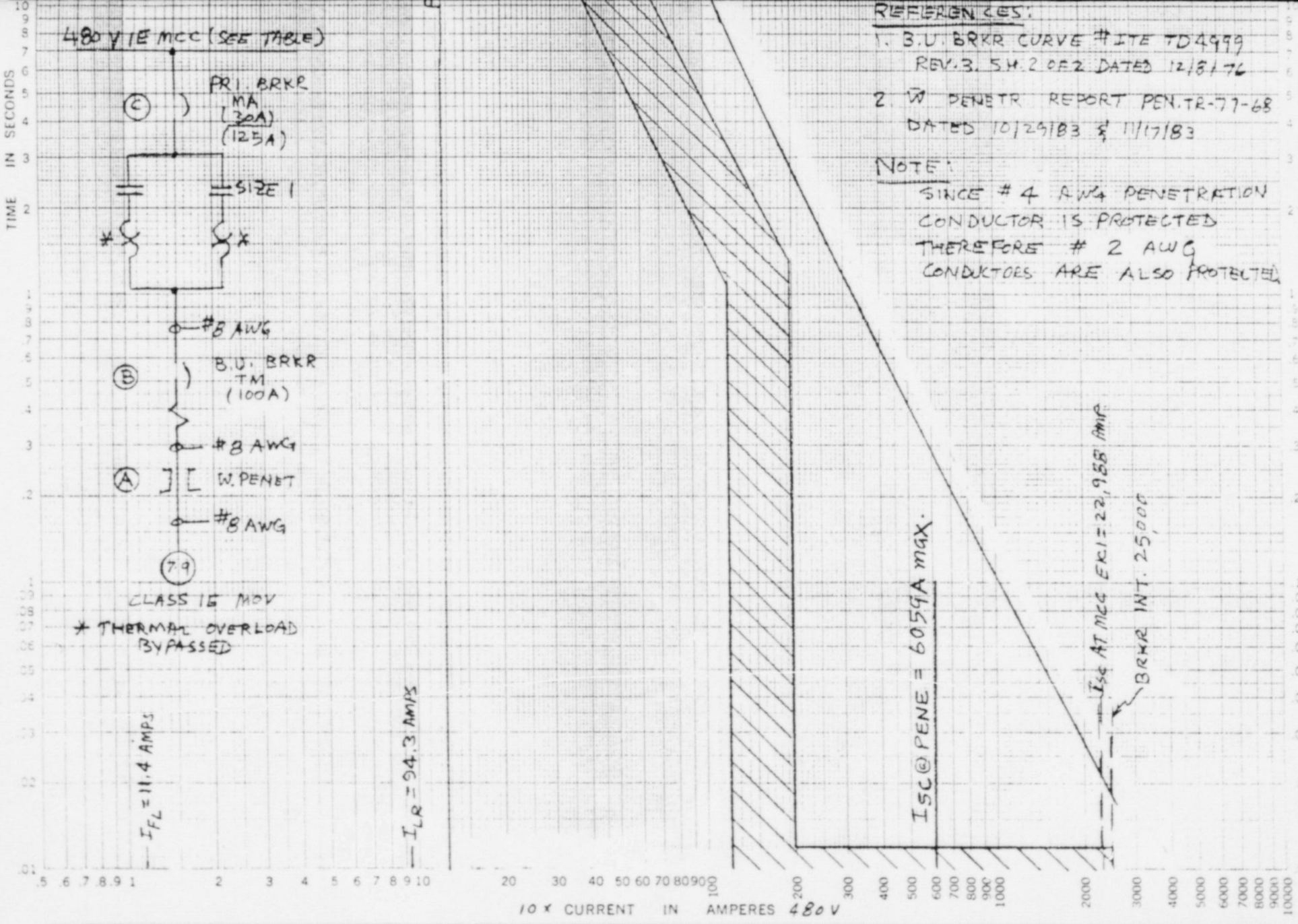
TI APERTURE CARD

Also Available On Aperture Card

8606160232-17

CURRENT IN AMPERES

MCC	PR. BRKR. CMP.	PR. BRKR. CAT. NO. (SETTING)	B.U. BRKR. CMP.	B.U. BRKR. CAT. NO.	PENET. NO.	PENET. SIZE	MOV HP	MOV I_{FL}	MOV I_{LR}	CABLE SIZE	REF. DWG	REF. CURVE NO. 7 SH.
E1B1	H2	EF3A003 (12A)	W6L	HE3B015	P038	8	0.33	0.75	5.25	10	9-E-PMAD-01 REV. 6	SH 1 OF 7
	H3	EF3A003 (12A)	W6R		P038		0.7	2.3	11.9			
	J1	EF3A003 (21A)	W3R		P036		0.66	2.3	11.9			
	J2	EF3A005 (41A)	L1R	HE3B030	P036		1.9	3.5	26			SH. 3 OF 7
	U2	EF3A003 (12A)	V2R	HE3B015	P043	6	0.033	0.03	0.09		9-E-PMAD-02 REV. 6	SH. 1 OF 7
	U1		X2L		P043	6	0.033	0.03	0.09			
	P3		V1L		P036	8	0.033	0.32				
	T1	EF3A003 (21A)	X1L		P038		0.7	2.3	11.9			
	N1	EF3A003 (12A)	W3L		P036		0.033	0.32				
	X4	EF3A003 (12A)	X1R		P036		0.033	0.32				



REFERENCES:

1. B.U. BRKR CURVE #ITE TD4999 REV. 3. SH. 2 OF 2 DATED 12/8/76
2. W PENETR REPORT PEN.TR-77-68 DATED 10/25/83 & 11/17/83

NOTE:

SINCE # 4 AWG PENETRATION CONDUCTOR IS PROTECTED THEREFORE # 2 AWG CONDUCTORS ARE ALSO PROTECTED

8606160232-18

1E MCC PENET #6, 4 & 2 AWG TIME-CURRENT CHARACTERISTIC CURVES

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards SEE REFERENCES 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. 8

Date 10/22/85

CURVE #2 18

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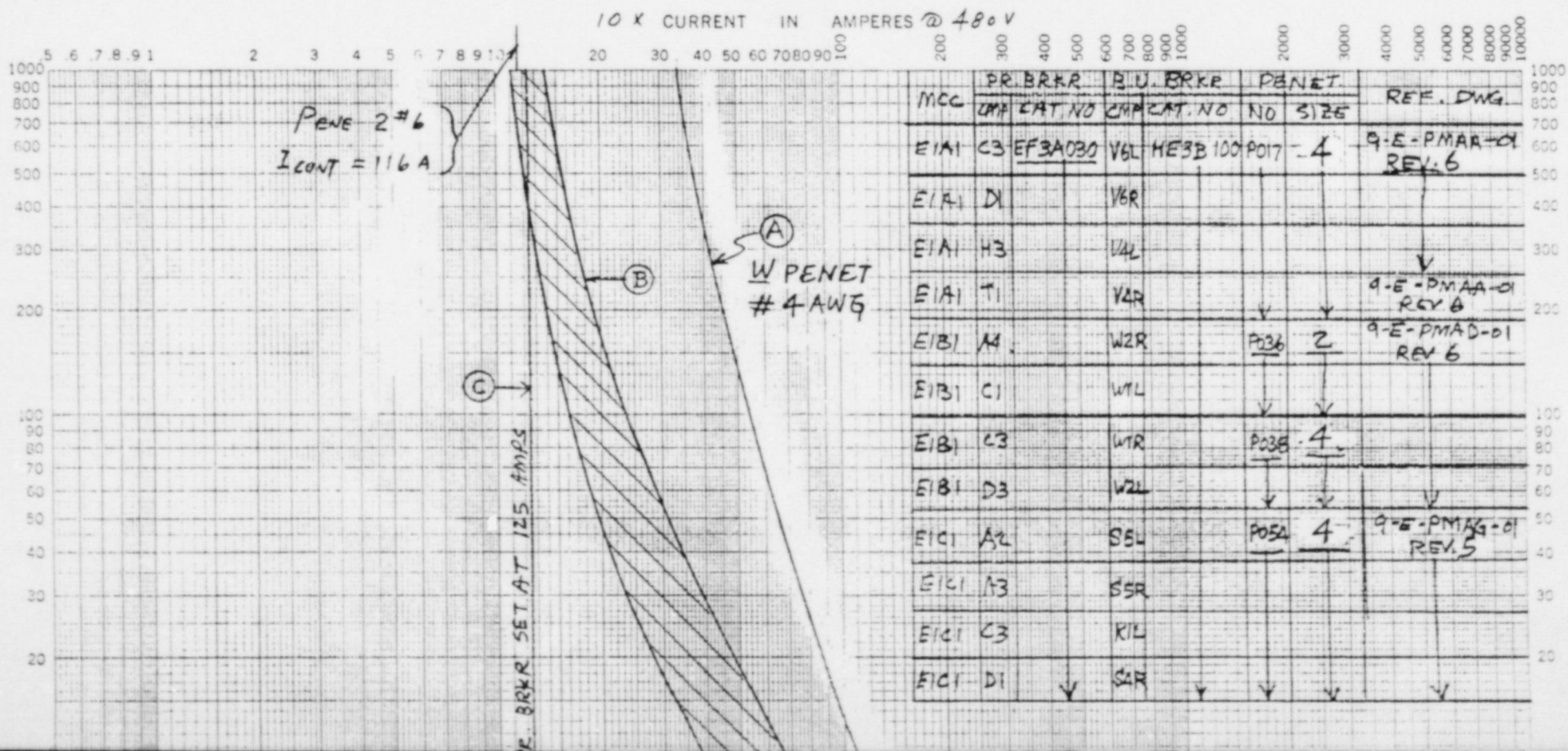
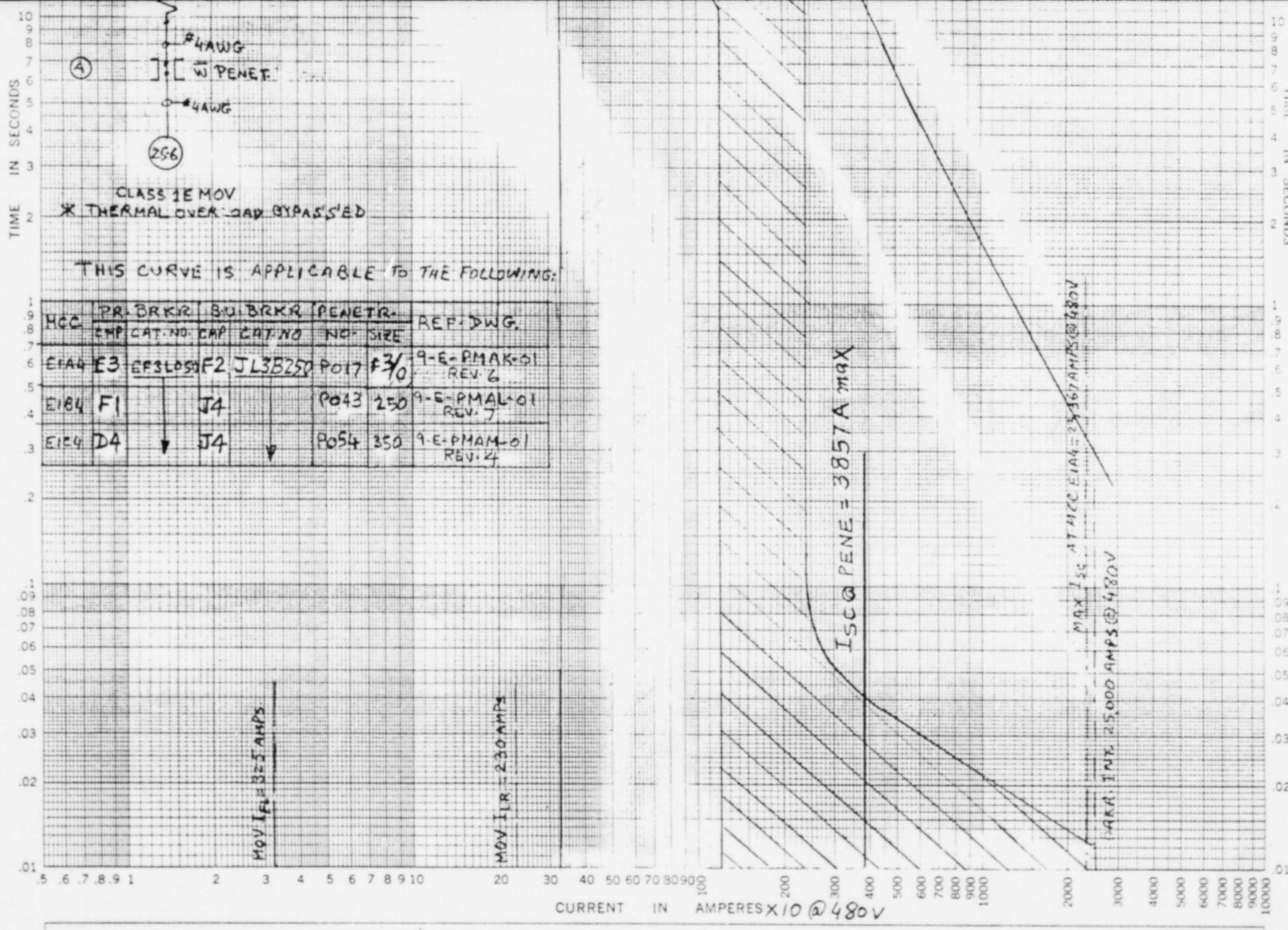
Also Available On
Aperture Card

8606160232-18



MCC	PR. BRKR CMP	PR. BRKR CAT. NO	B.U. BRKR CMP	B.U. BRKR CAT. NO	PENET. NO	PENET. SIZE	REF. DWG.
E1A1	C3	EF3A030	V6L	HE3B 100	P017	4	9-E-PMAR-01 REV. 6
E1A1	D1		V6R				
E1A1	H3		V4L				
E1A1	T1		V4R				9-E-PMAA-01 REV 6
E1B1	A4		W2R		P036	2	9-E-PMAD-01 REV 6
E1B1	C1		W1L				
E1B1	C3		W1R		P038	4	
E1B1	D3		W2L				
E1C1	A2		S5L		P052	4	9-E-PMAG-01 REV. 5
E1C1	A3		S5R				
E1C1	C3		K1L				
E1C1	D1		S4R				



MCC	PR. BRKR CMP	PR. BRKR CAT. NO.	BU. BRKR CMP	BU. BRKR CAT. NO	PENETR. NO.	PENETR. SIZE	REF. DWG.
E1A4	E3	EF3L050	F2	JL3B250	P017	#3/0	9-E-PMAK-01 REV. 6
E1B4	F1		J4		P043	250	9-E-PMAL-01 REV. 7
E1C4	D4		J4		P054	350	9-E-PMAM-01 REV. 4

CLASS 1E MCC PENET # #2 + #3/0, 250 & 350 MCM TIME-CURRENT CHARACTERISTIC CURVES **8606160232-19**

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards SEE REFERENCES 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. 9

Date 10/23/85

REVISED 19

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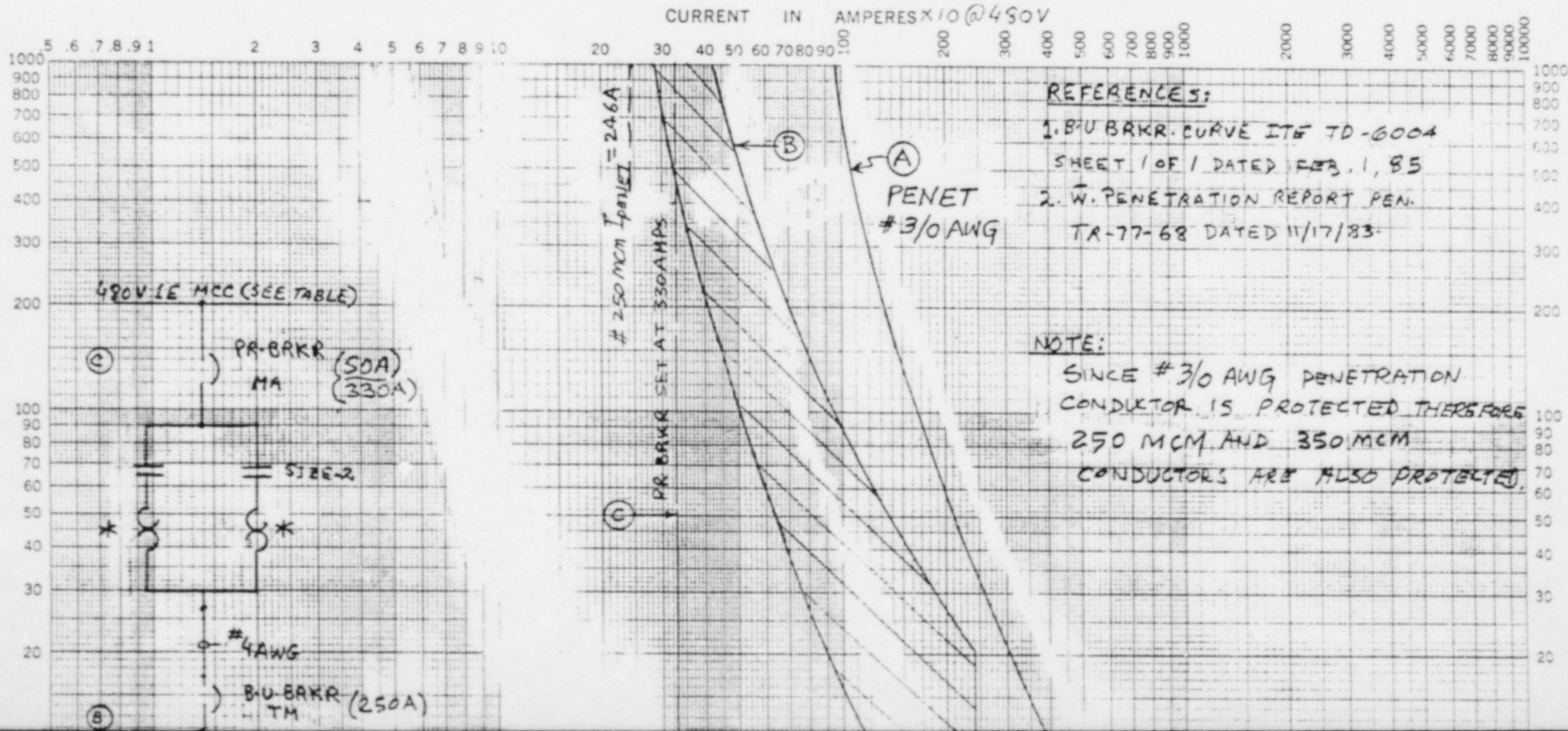
CARD

Also Available On
Aperture Card

8606160232-19



NON-3E MCC PENET. #8,4 & 2 Awg TIME-CURRENT CHARACTERISTIC CURVES

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards SEE REFERENCES (SHEET 2 OF 2) 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

8606160232-20

No. 11 (SHEET 1 OF 2)

Date 11/4/85

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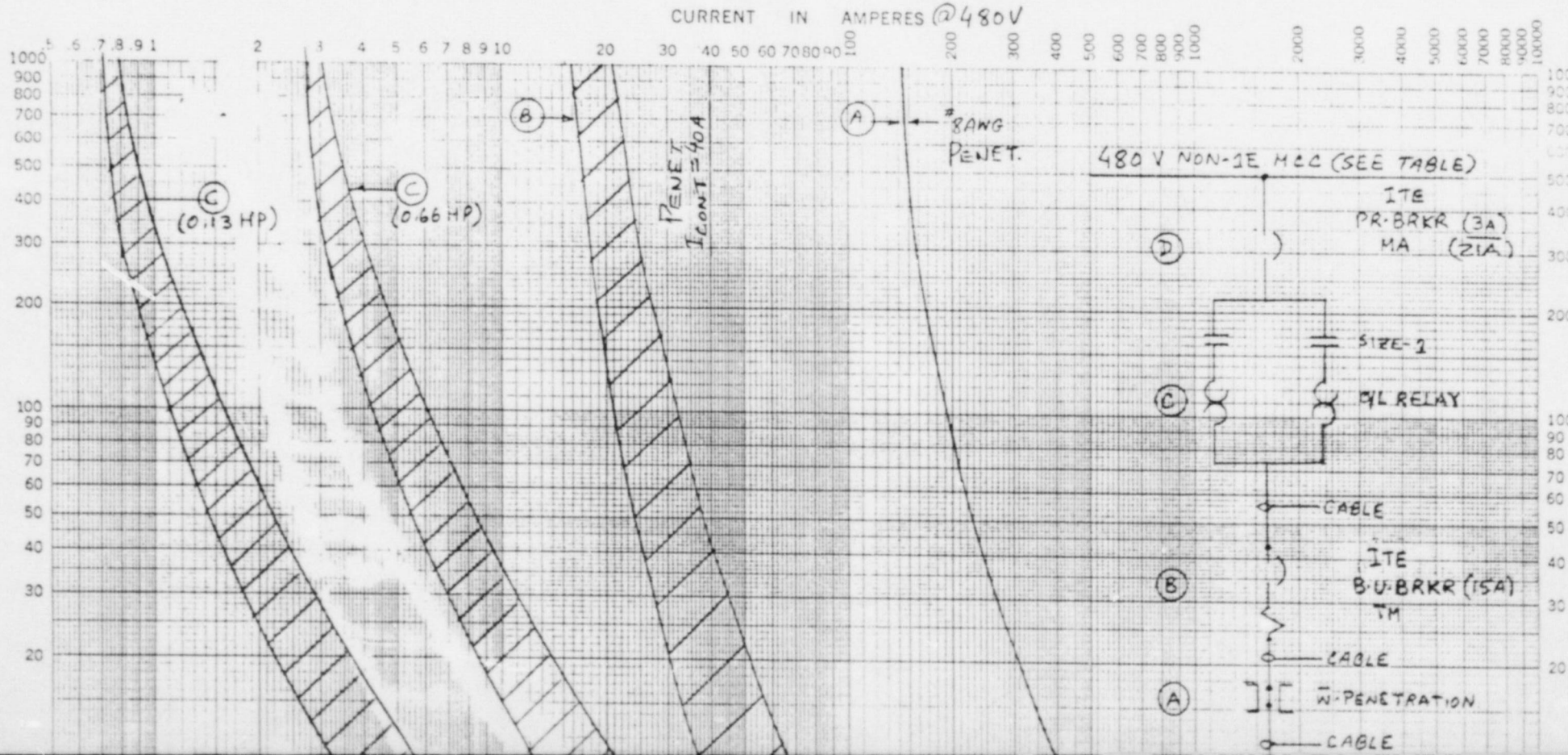
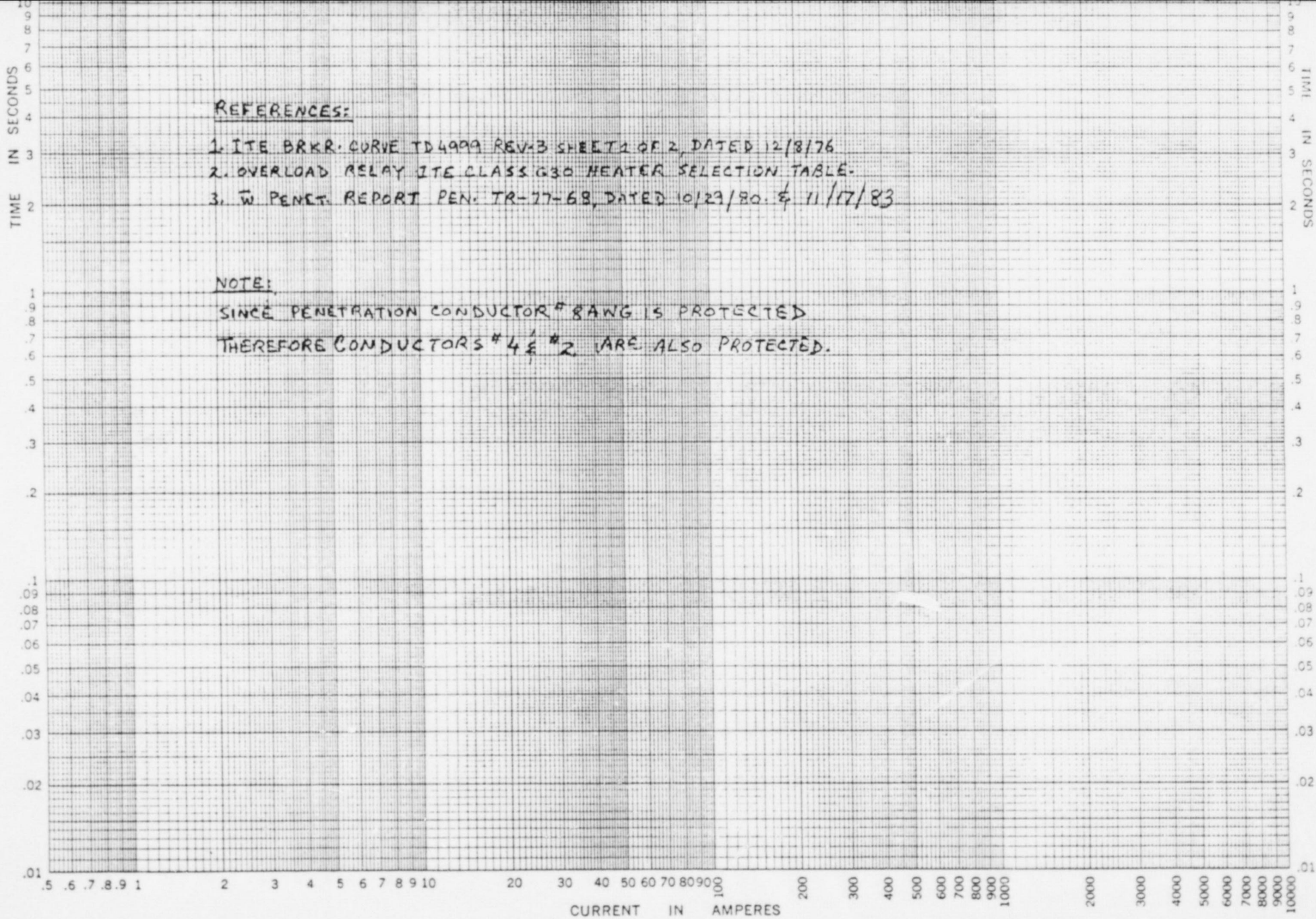
Also Available On
Aperture Card

8606160232-20





NON-1E MCC PENET # 8, 4, & 2 AWG TIME-CURRENT CHARACTERISTIC CURVES

8606160232-21

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards SEE REFERENCES 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. 11 (SHEET 2 OF 2)

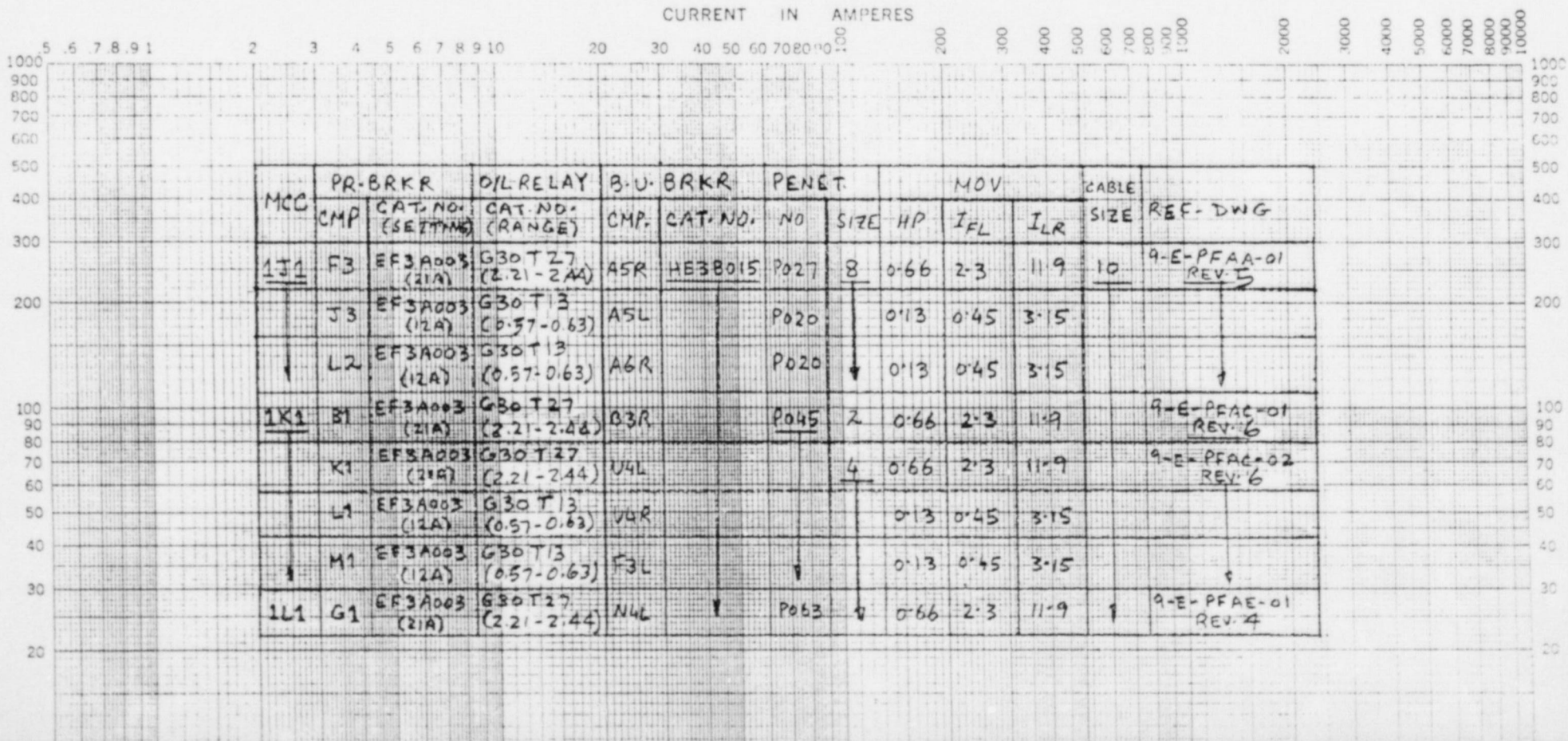
Date 11/4/85

CURVE NO 21

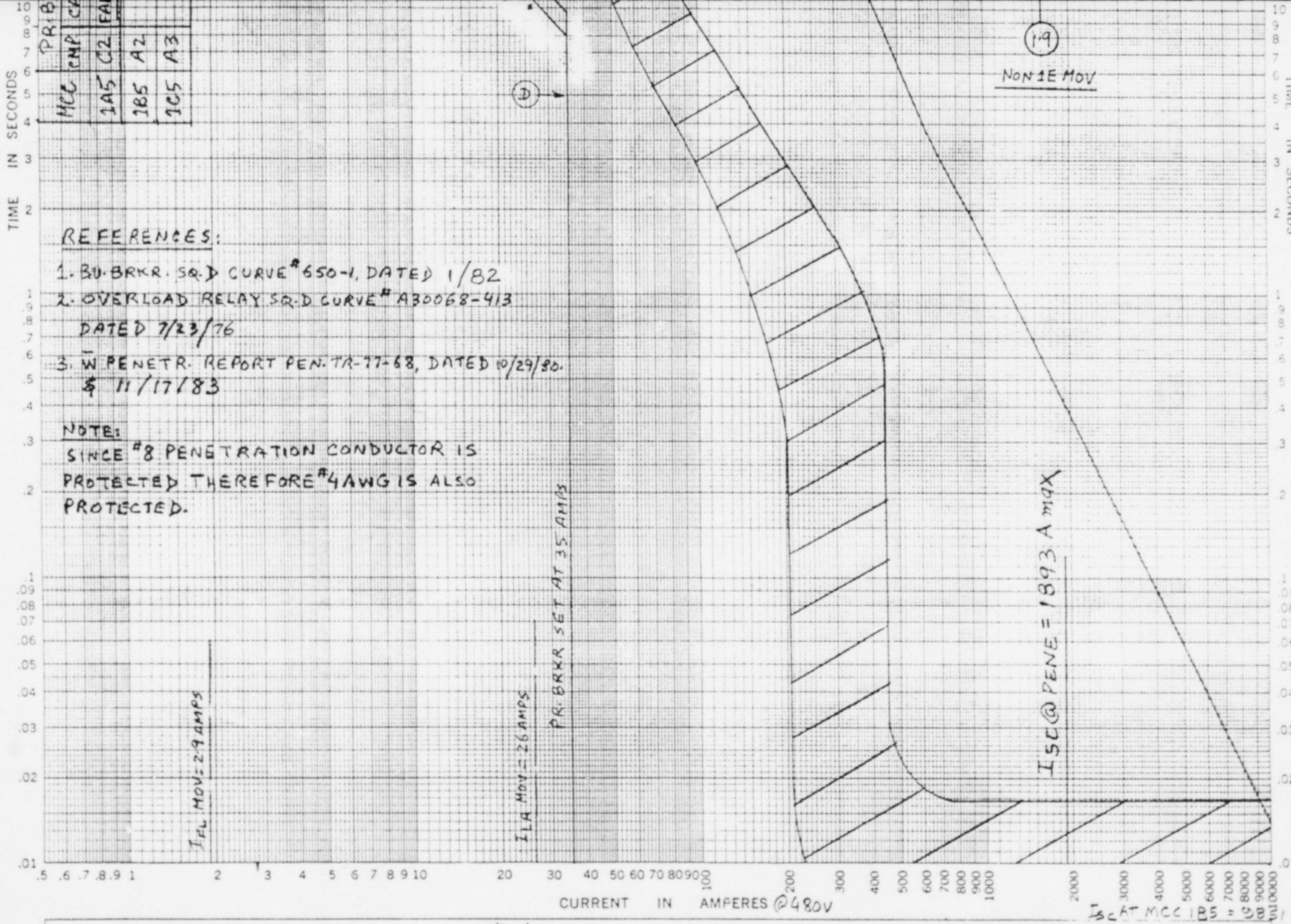
TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-21



MCC	PR-BRKR CMP	PR-BRKR CAT. NO. (SETTING)	O/L RELAY CAT. NO. (RANGE)	B.U. BRKR CMP.	B.U. BRKR CAT. NO.	PENET NO	MOV SIZE	MOV HP	MOV I_{FL}	MOV I_{LR}	CABLE SIZE	REF. DWG
1J1	F3	EF3A003 (21A)	G30T27 (2.21-2.44)	A5R	HE38015	P027	8	0.66	2.3	11.9	10	9-E-PFAA-01 REV. 5
	J3	EF3A003 (12A)	G30T13 (0.57-0.63)	A5L		P020		0.13	0.45	3.15		
	L2	EF3A003 (12A)	G30T13 (0.57-0.63)	A6R		P020		0.13	0.45	3.15		
1K1	B1	EF3A003 (21A)	G30T27 (2.21-2.44)	B3R		P045	2	0.66	2.3	11.9		9-E-PFAC-01 REV. 6
	K1	EF3A003 (21A)	G30T27 (2.21-2.44)	U4L			4	0.66	2.3	11.9		9-E-PFAC-02 REV. 6
	L1	EF3A003 (12A)	G30T13 (0.57-0.63)	V4R				0.13	0.45	3.15		
	M1	EF3A003 (12A)	G30T13 (0.57-0.63)	F3L				0.13	0.45	3.15		
1L1	G1	EF3A003 (21A)	G30T27 (2.21-2.44)	N4L		P063		0.66	2.3	11.9		9-E-PFAE-01 REV. 4



REFERENCES:

1. BU. BRKR. SQ.D CURVE # 650-1, DATED 1/82
2. OVERLOAD RELAY SQ.D CURVE # A30068-413 DATED 7/23/76
3. W PENETR. REPORT PEN. TR-77-68, DATED 10/29/80. & 11/17/83

NOTE:
SINCE #8 PENETRATION CONDUCTOR IS PROTECTED THEREFORE #4 AWG IS ALSO PROTECTED.

NON 1E MCC PENET. #8 & #4 AWG TIME-CURRENT CHARACTERISTIC CURVES

8606160232-22

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards SEE REFERENCES ABOVE Dated –

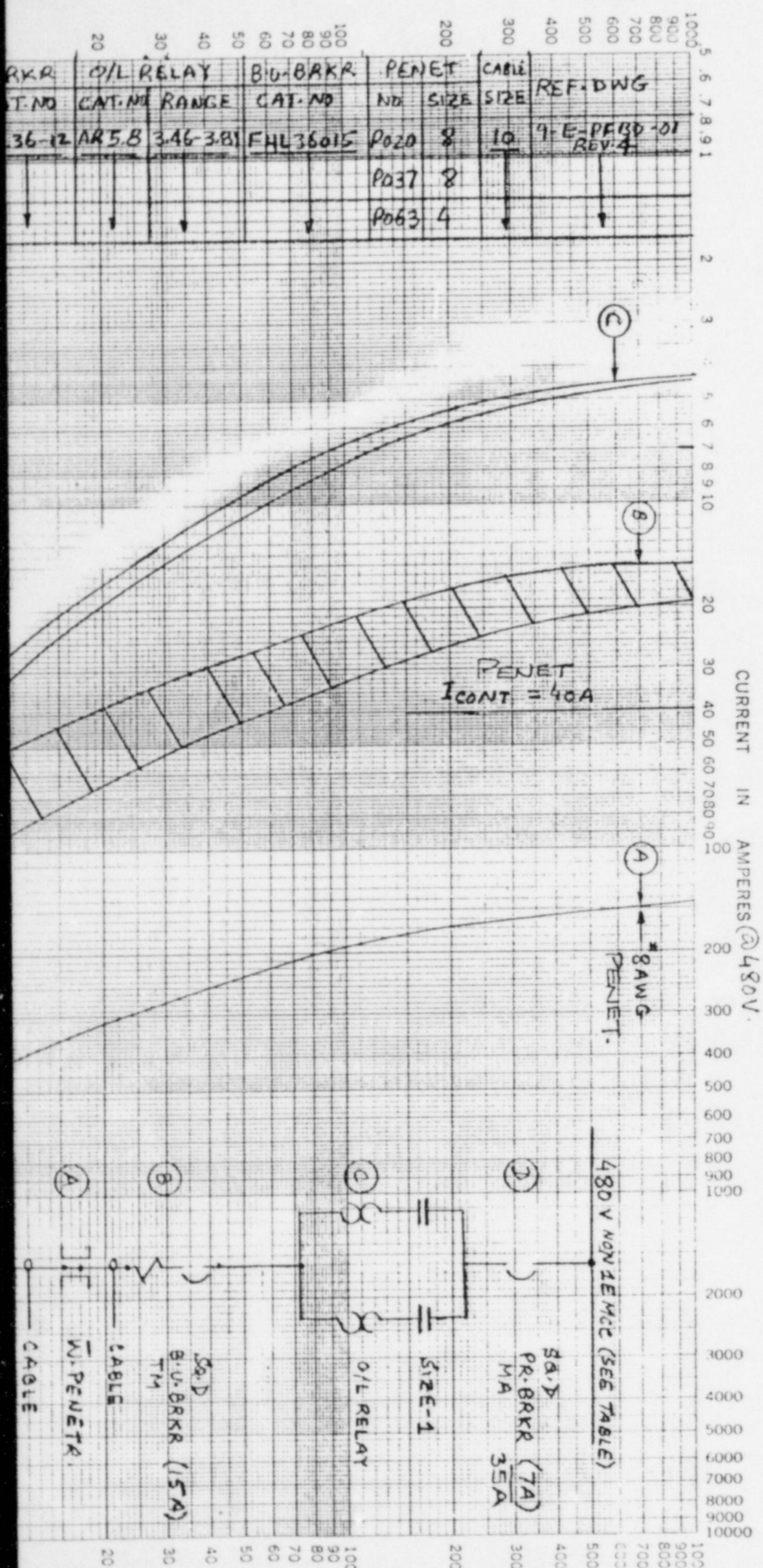
1. Tests made at Volts a-c at p-f., starting at 25C with no initial load

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

No. 12

Date 11/5/85

CURVE NO 22.



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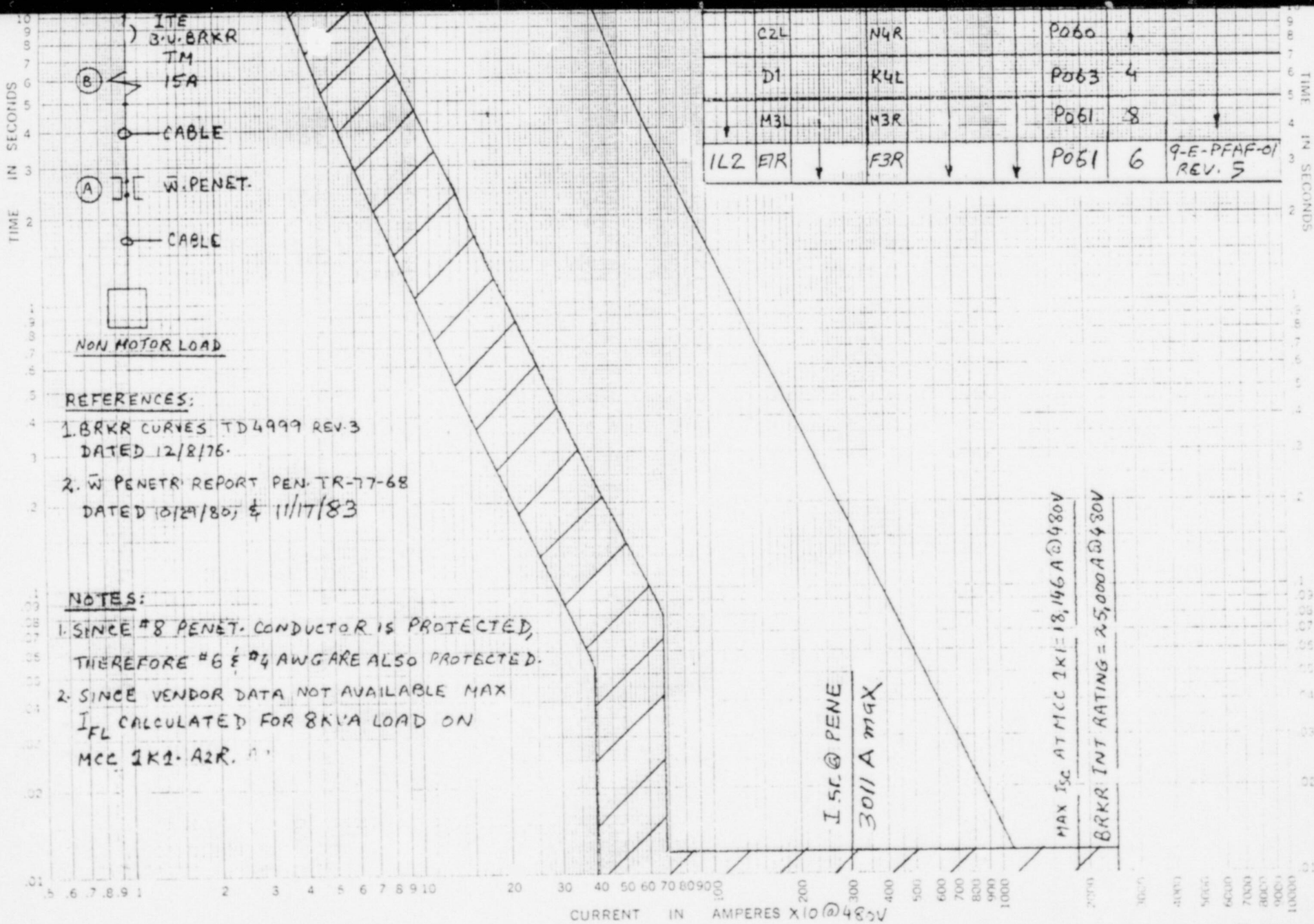
Also Available On
Aperture Card

8606160232-22



REFERENCES:

1. BRKR CURVES TD4999 REV. 3 DATED 12/8/76.
2. W PENETR. REPORT PEN. TR-77-68 DATED 10/29/80; & 11/17/83

NOTES:

1. SINCE #8 PENET. CONDUCTOR IS PROTECTED, THEREFORE #6 & #4 AWG ARE ALSO PROTECTED.
2. SINCE VENDOR DATA NOT AVAILABLE MAX I_{FL} CALCULATED FOR 8 KVA LOAD ON MCC 1K1-A2R.

NON-1E MCC PENET #8, 6, & 4 AWG TIME-CURRENT CHARACTERISTIC CURVES 8606160232-23

For SOUTH TEXAS PROJECT Fuse Links. In –

BASIS FOR DATA Standards SEE REFERENCES ABOVE 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. 1

Date 10/17/85

CURVE No. 23

MCC	PR. BRKR CMP	PR. BRKR CAT NO	BU. BRKR CMP	BU. BRKR CAT NO	CABLE SIZE	PENET NO	PENET SIZE	REF. DWG
1J1	E1	HE3B015	A6L	HE3B015	10	P020	8	9-E-PFAA-01 REV. B
	A2L		R3L					
	B3L		Q3R					
	C1R		E4L		8		6	9-E-PFAC-01 REV. E
1K1	A2L		E4L		10	P037	8	
	A2R		J3R		8	P045	4	
	A3R		D4L		10	P037	8	
	A5L		A6L			P037	8	
	C1		H3L			P045	4	
	D3		H3R			P037	8	
1L1	B3L		B4L			P060		9-E-PFAE-01 REV. H

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Also Available On
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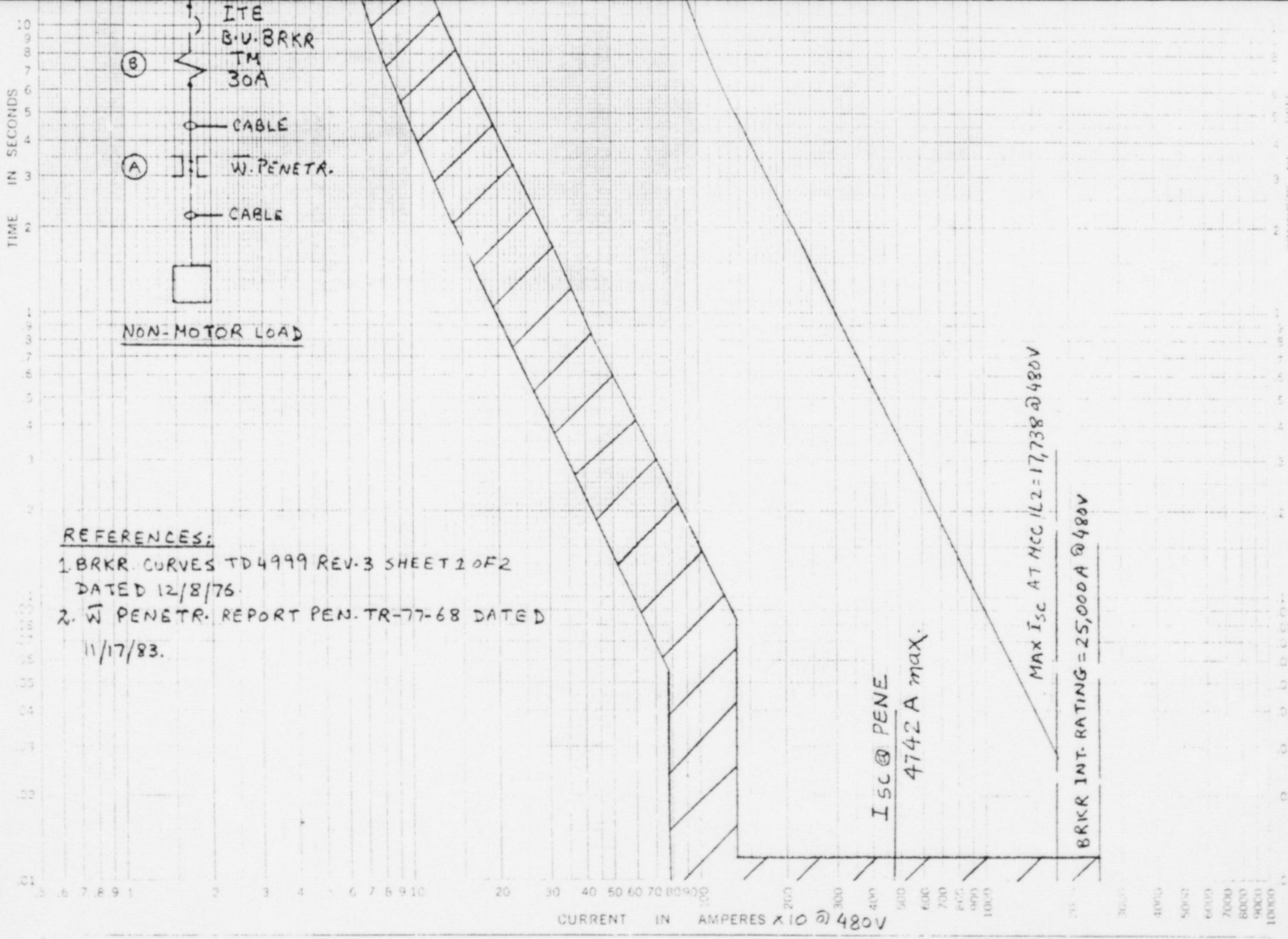
8606160232-23



REFERENCES:

1. BRKR. CURVES TD4999 REV. 3 SHEET 1 OF 2 DATED 12/8/76.
2. W PENETR. REPORT PEN. TR-77-68 DATED 11/17/83.

NON-1E MCC PENET #4 AWG TIME-CURRENT CHARACTERISTIC CURVES

8606160232-24

For SOUTH TEXAS PROJECT Fuse Links. In —

BASIS FOR DATA Standards SEE REFERENCES ABOVE 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. 2

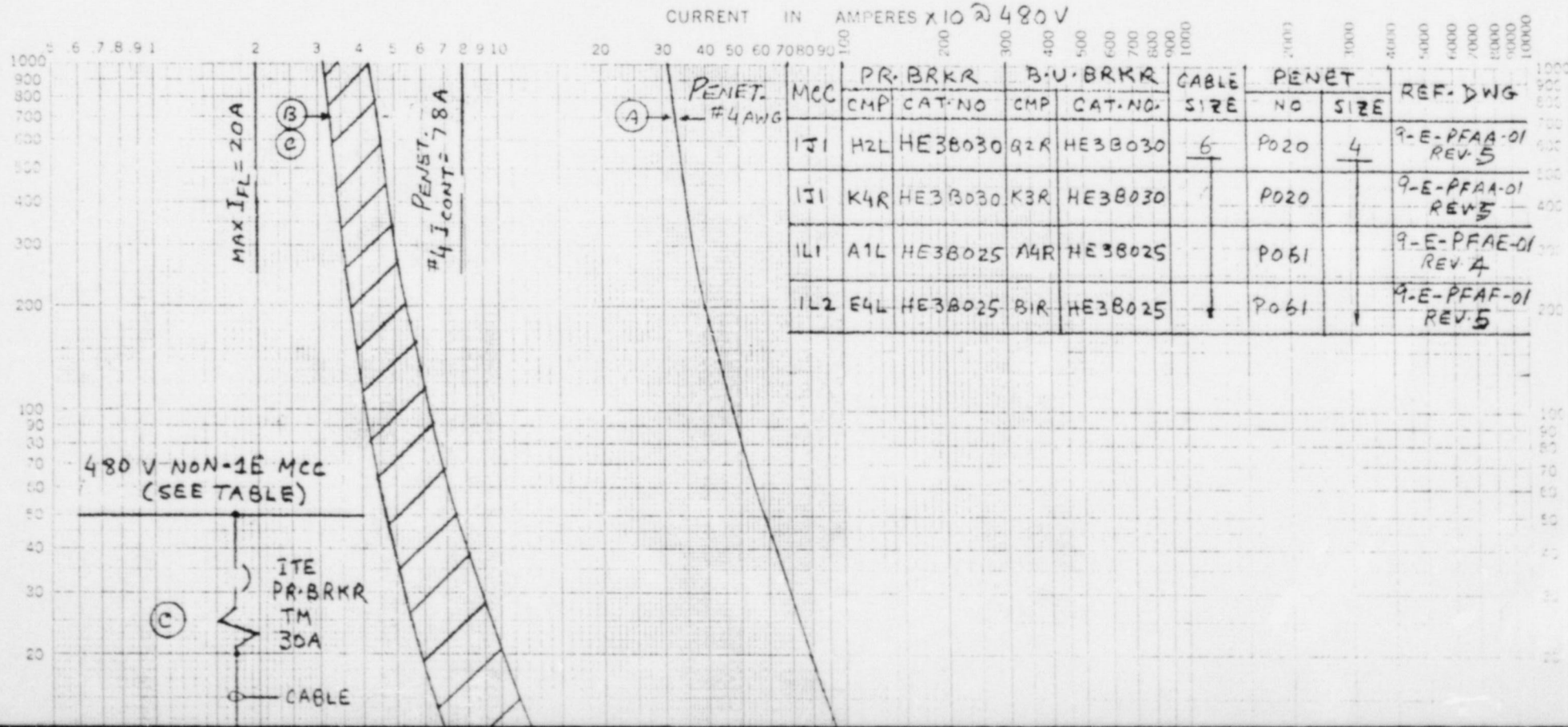
Date 10/17/85

FIDVL NO 24

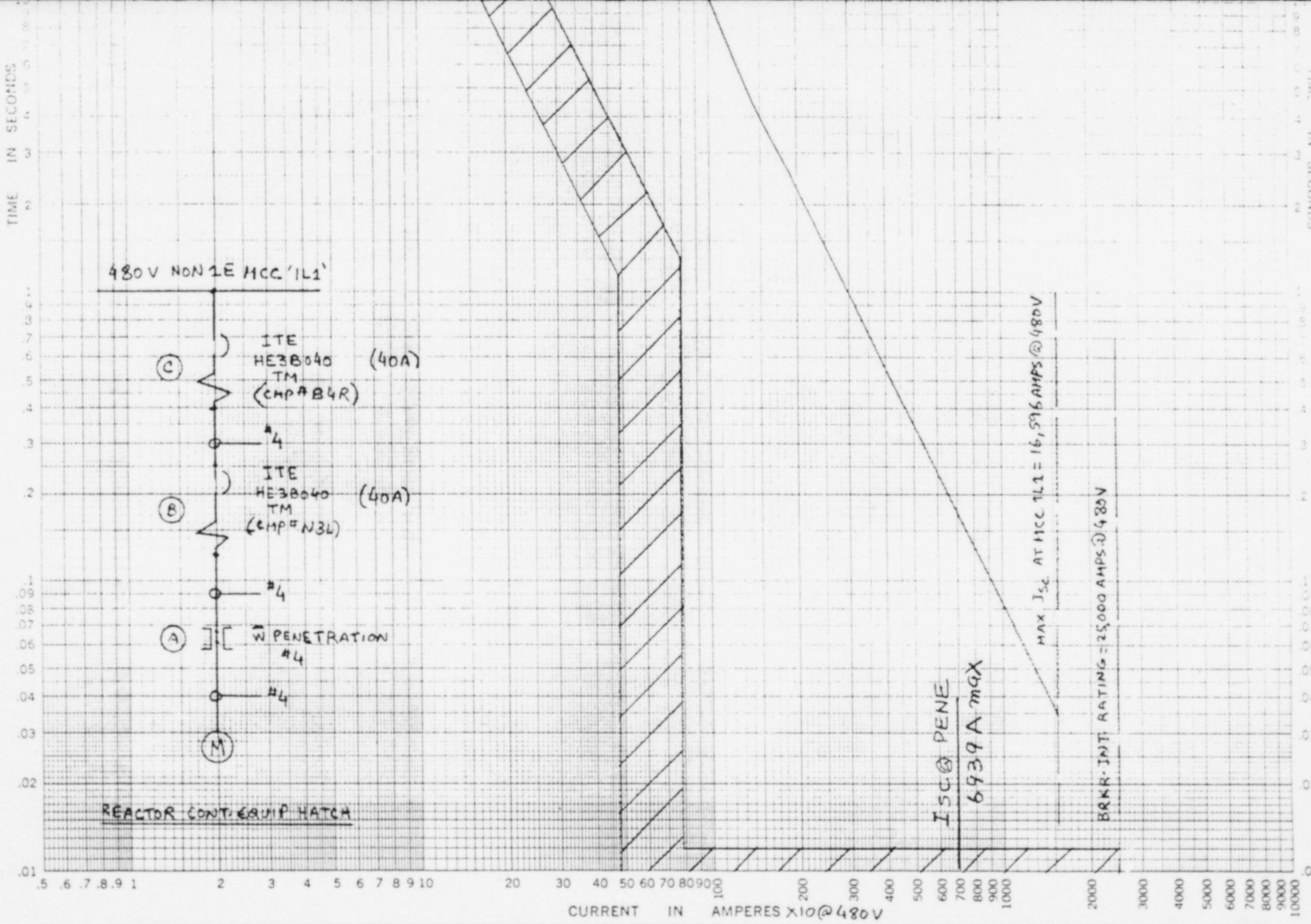
TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-24



MCC	PR·BRKR CMP	PR·BRKR CAT·NO	B·U·BRKR CMP	B·U·BRKR CAT·NO	CABLE SIZE	PENET NO	PENET SIZE	REF·DWG
1J1	H2L	HE3B030	Q2R	HE3B030	6	P020	4	9-E-PFAA-01 REV·5
1J1	K4R	HE3B030	K3R	HE3B030		P020		9-E-PFAA-01 REV·5
1L1	A1L	HE3B025	A4R	HE3B025		P061		9-E-PFAE-01 REV·4
1L2	E4L	HE3B025	B1R	HE3B025		P061		9-E-PFAF-01 REV·5



NON-1E MCC PENET #4AWG TIME-CURRENT CHARACTERISTIC CURVES 8606160232-25

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards SEE REFERENCES ABOVE 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. 3

Date 10/17/85

CURVE NO 25

REFERENCES:

1. BRKR CURVES TD 4999 REV. 3 SHEET 2 OF 2 DATED 12/8/76
2. W PENETRATION REPORT PEN TR-7-7-68 DATED 11/17/83
3. MCC 1L1 S/L DIAGRAM 9-E-PFAE-01, REV 4

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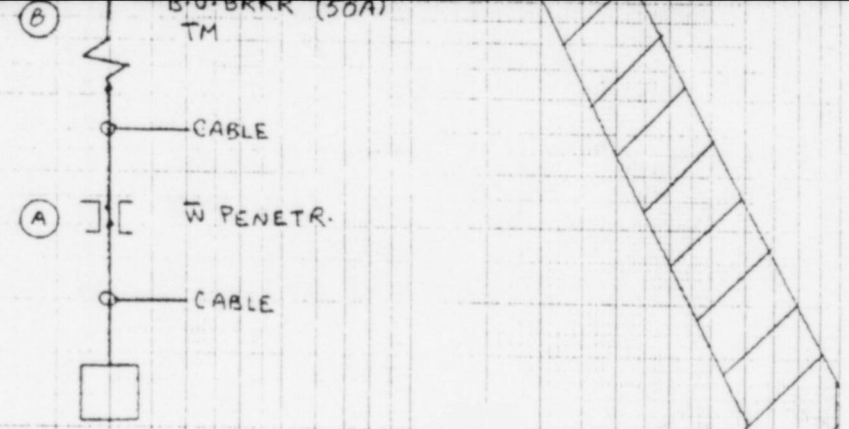
Also Available On
Aperture Card

8606160232-25



30 KVA LIGHTING XFMR

MCC	PR. BRKR CMP	PR. BRKR CAT. NO.	B.U. BRKR CMP	B.U. BRKR CAT. NO.	CABLE SIZE	PENETRATION NO	PENETRATION SIZE	REF. DWG
1J1	A2R	HE3B050	E4R	HE3B050	2	P027	1/0	9-E-PFAA-01 REV. 5
	K4L		B5R			P027	1/0	
	A1L		B5L			P020	3/0	
	A3L		Q2L			P020	3/0	
1K1	A4R		U3R			P045	1/0	9-E-PFAC-01 REV 6
1K1	A3L		F3R			P037	3/0	
1L1	A3L		A4L			P061		9-E-PFAF-01 REV 5
1L1	E1L		N3R			P061		

NON-1E MCC PENET. #1/0 & 3/0 AWG TIME-CURRENT CHARACTERISTIC CURVES 8606160232-26

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards SEE REFERENCES ABOVE 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. 4

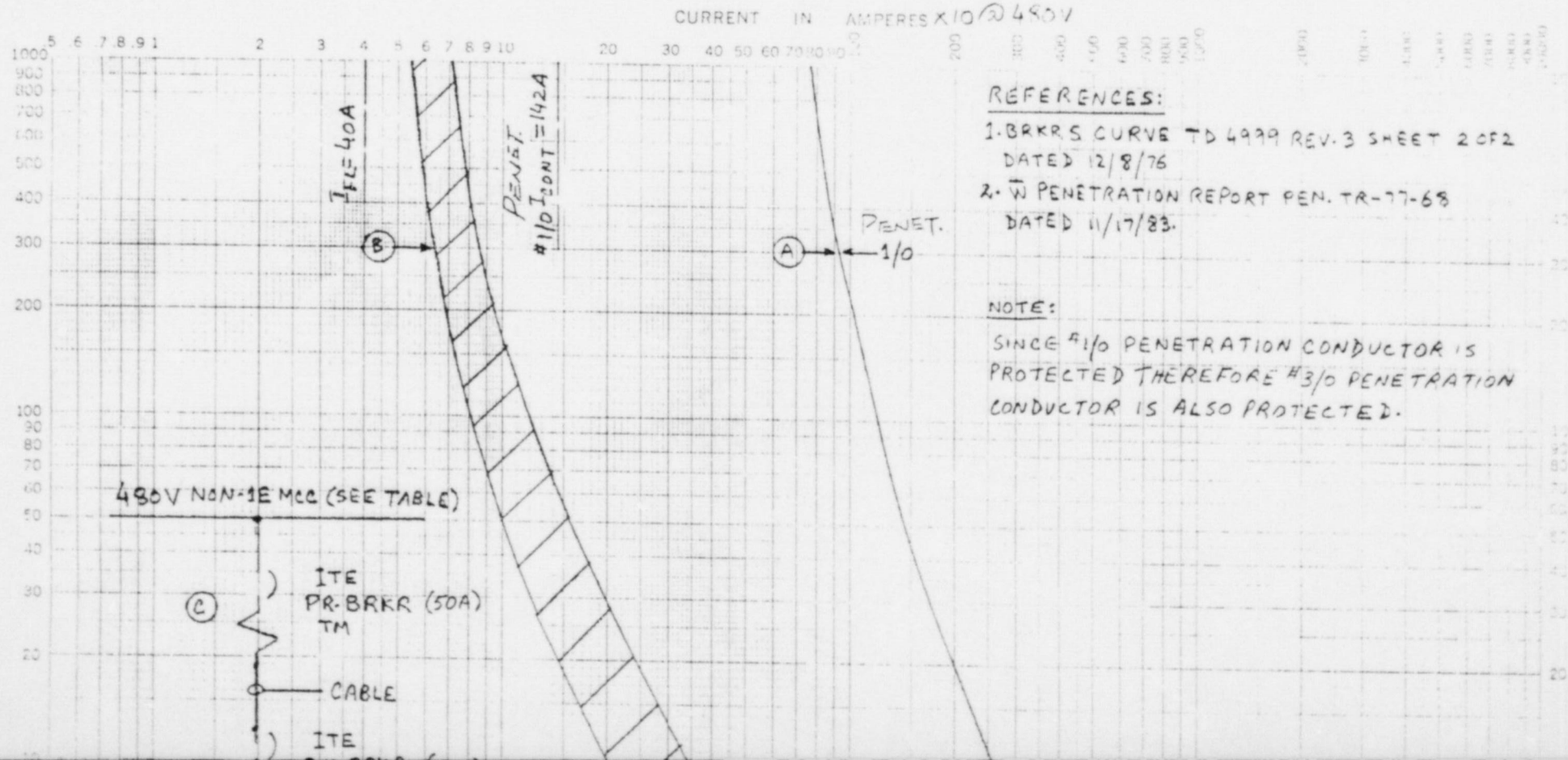
Date 10/18/85

CURVE NO 26

TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-26

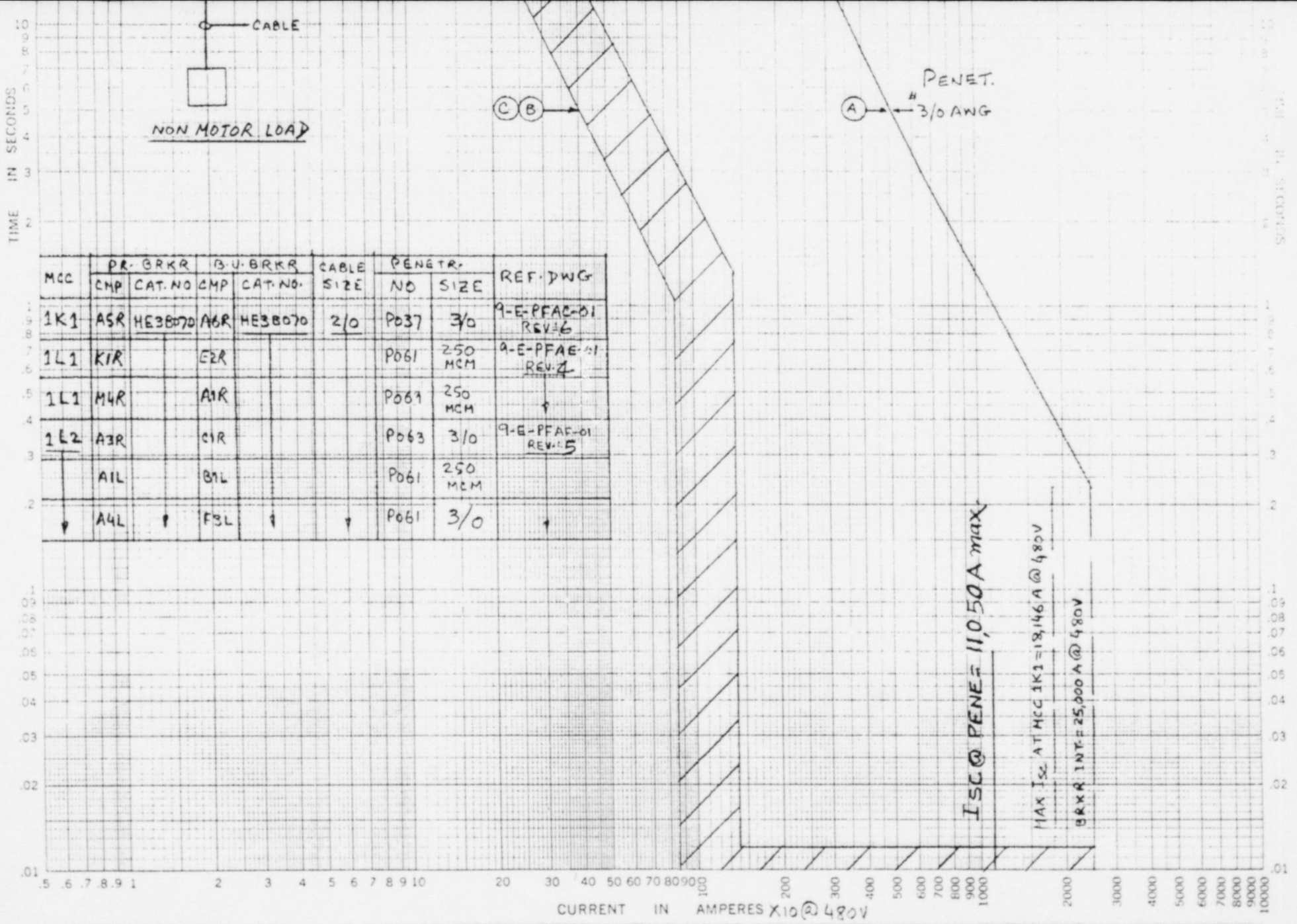


REFERENCES:

1. BRKR S CURVE TD 4999 REV. 3 SHEET 2 OF 2 DATED 12/8/76
2. W PENETRATION REPORT PEN. TR-77-68 DATED 11/17/83.

NOTE:

SINCE #1/0 PENETRATION CONDUCTOR IS PROTECTED THEREFORE #3/0 PENETRATION CONDUCTOR IS ALSO PROTECTED.



MCC	PR. BRKR		B.U. BRKR		CABLE SIZE	PENETR.		REF. DWG
	CMP	CAT. NO	CMP	CAT. NO.		NO	SIZE	
1K1	A5R	HE3B070	A6R	HE3B070	2/0	P037	3/0	9-E-PFAC-01 REV-6
1L1	K1R		E2R			P061	250 MCM	9-E-PFAE-01 REV-4
1L1	M4R		A1R			P069	250 MCM	↑
1L2	A3R		C1R			P063	3/0	9-E-PFAF-01 REV-5
	A1L		B1L			P061	250 MCM	
↓	A4L	↑	F3L	↑	↑	P061	3/0	↑

NON-1E MCC PENET. # 3/0 & 250MCM TIME-CURRENT CHARACTERISTIC CURVES 8606160232-27

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards. SEE REFERENCES ABOVE 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. 5

Date 10/18/85

Curve No 27

TI
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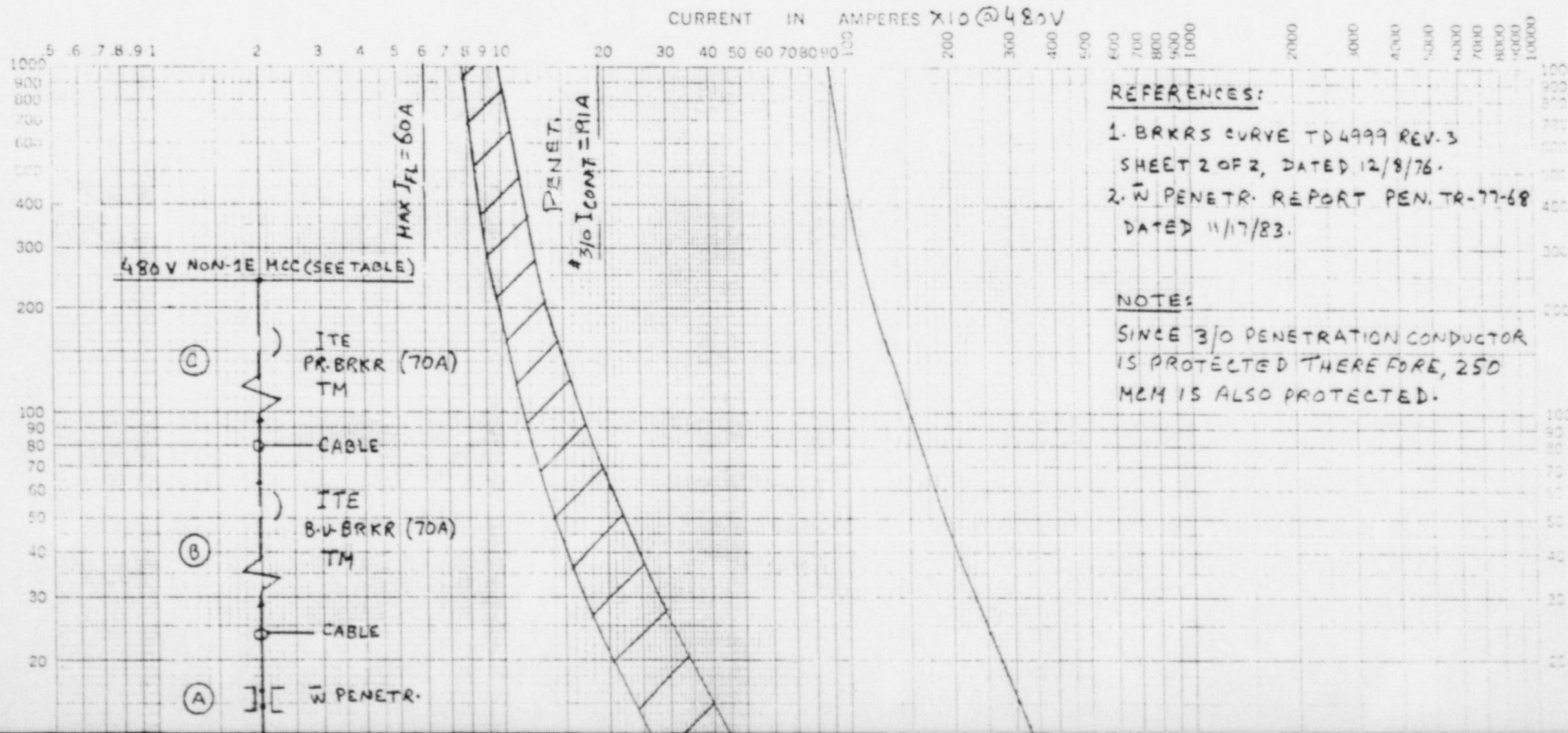
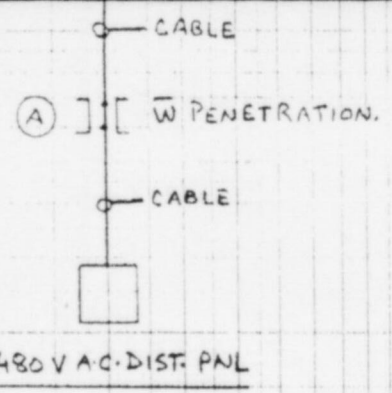
Also Available On
Aperture Card

8606160232-27





MCC	PR. BRKR		B.U. BRKR		CABLE	PENET.		REF. DWG
	CMP	CAT. NO	CMP	CAT. NO.	SIZE	NO	SIZE	
1J1	P3	FJ3B150	M2	FJ3B150	250 MCM	P020	350 MCM	9-E-PFAA-01 REV. 5
1J2	K1	FJ3B150	H1	FJ3B150	250 MCM	P020	350 MCM	9-E-PFAB-01 REV. 5

NON-1E MCC PENET. 350 MCM TIME-CURRENT CHARACTERISTIC CURVES

8606160232-28

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards SEE REFERENCES ABOVE 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. 6

Date 10/18/85

CURVE NO 28

TI
APERTURE
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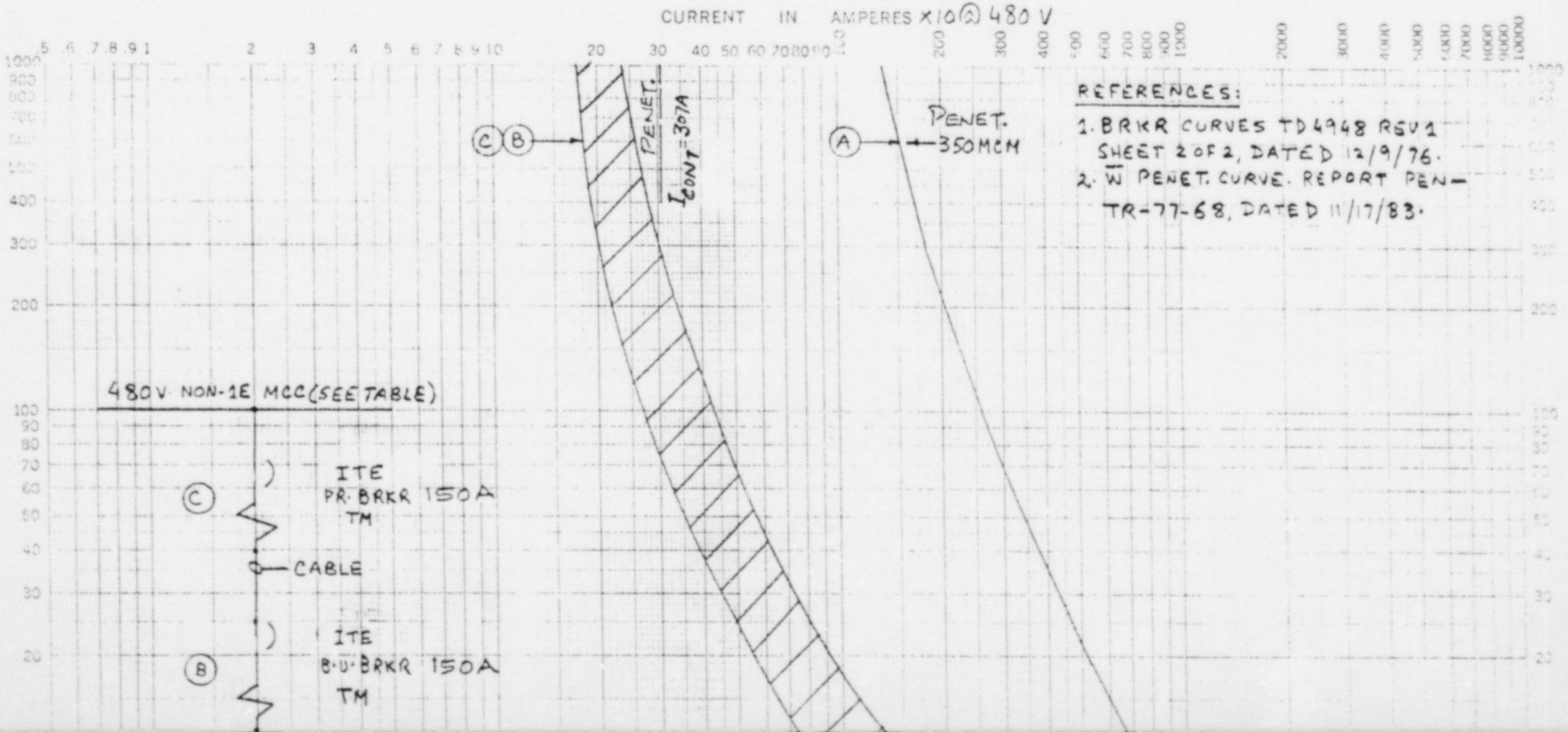
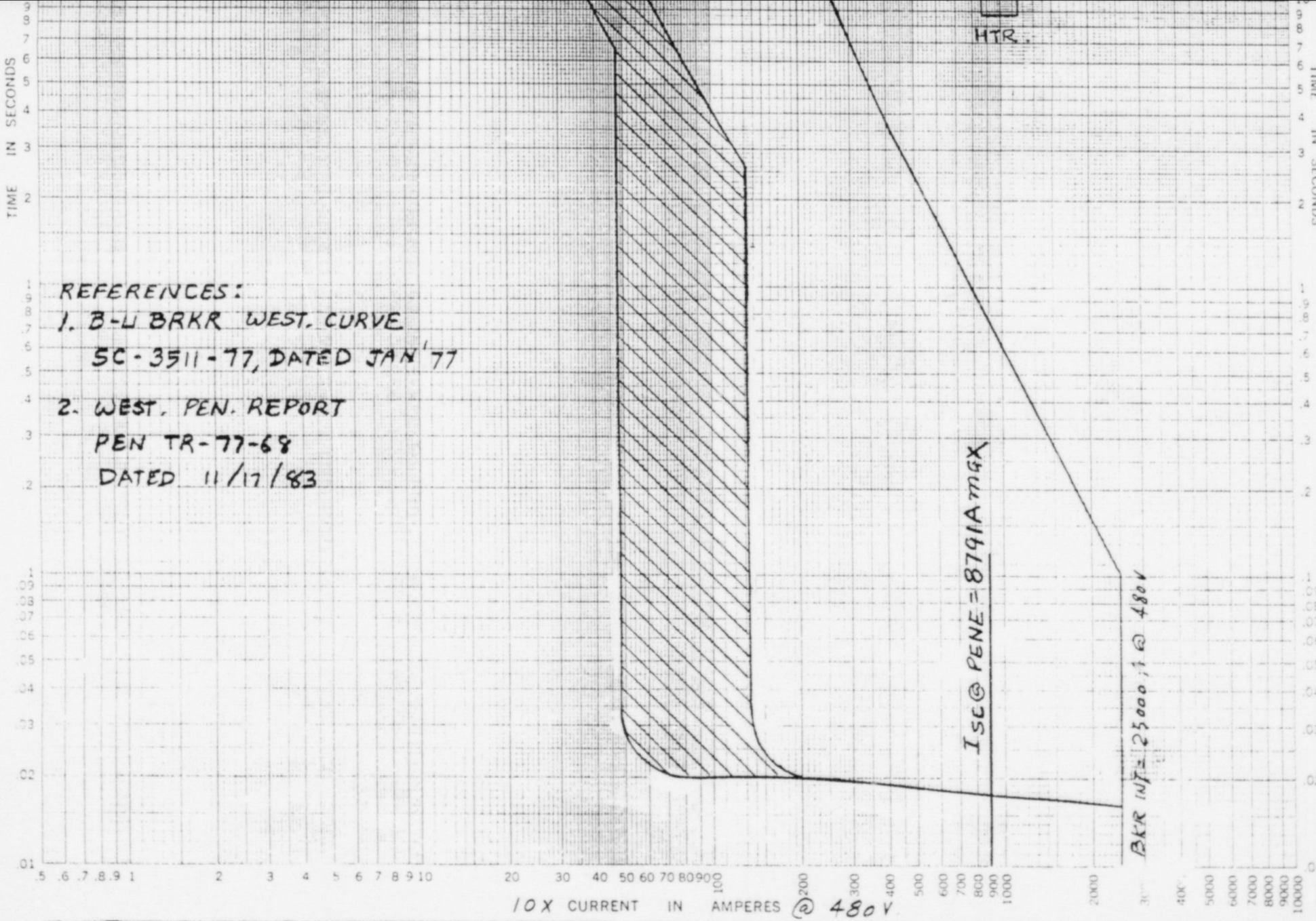
Also Available On
Aperture Card

8606160232-28





REACTOR COOLANT PRESSURIZER HEATER TIME-CURRENT CHARACTERISTIC CURVES

For SOUTH TEXAS PROJECT 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

8606160232-29

No. 19

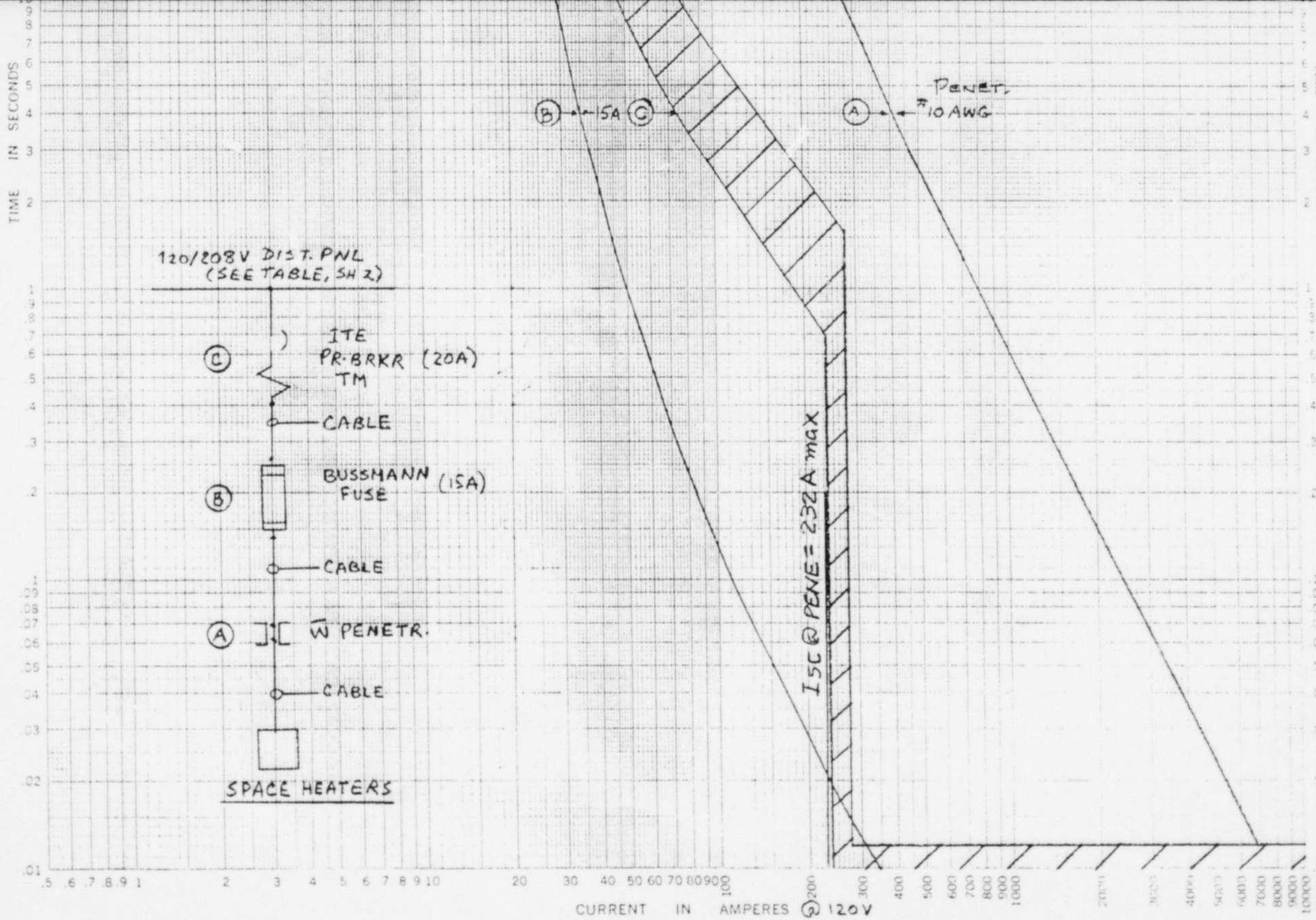
Date

CURVE NO 29

TI
APERTURE
CARD

Also Available On Aperture Card

8606160232-29



120/208 V DIST. PNL PENET 10A TIME-CURRENT CHARACTERISTIC CURVES

For SOUTH TEXAS PROJECT Fuse Links. In -

BASIS FOR DATA Standards SEE REFERENCES, SHEET 2 OF 2 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

8606160232-30

No. 20 SHEET 1 OF 2

Date 10/28/85

CURVE Nº 30

TI
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CARD

Also Available On
Aperture Card

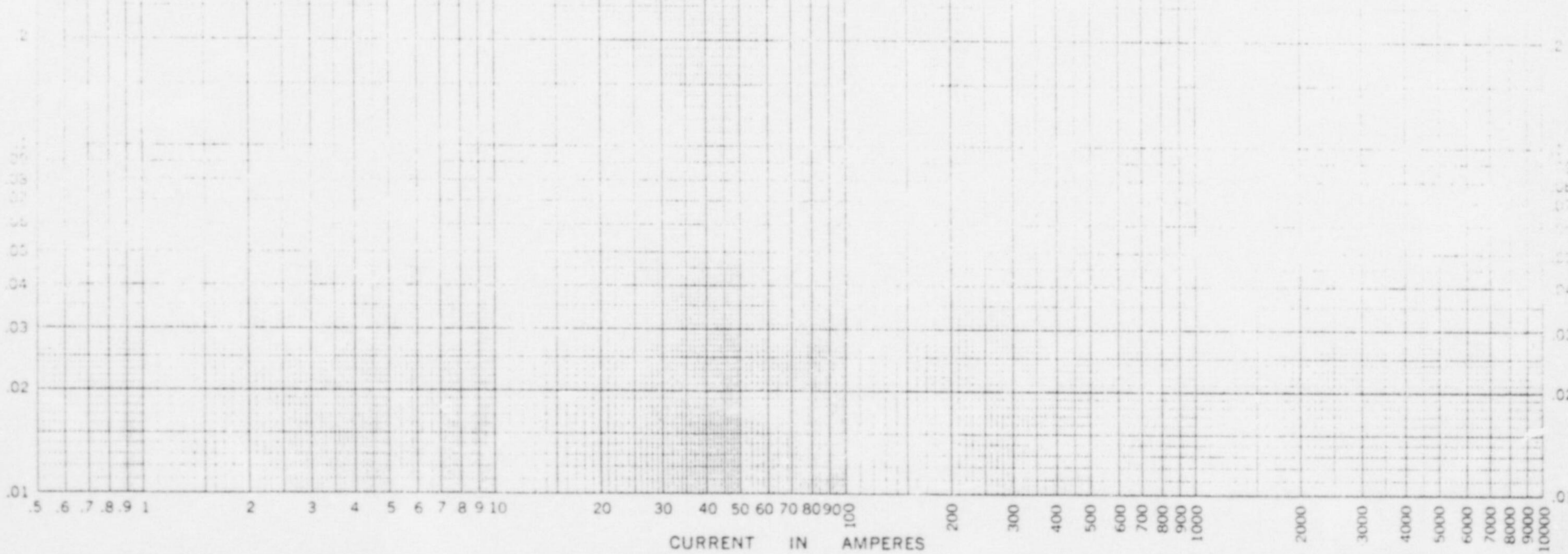
8606160232-30

DPK134	29							9-E-VNAV-01 REV 4
DPK234	29	↓	↓	↓	↓	↓	↓	↓

* CLASS 1E. DIST. PNL.

REFERENCES:

1. BRKR CURVE - TD 4943 REV 1, SHEET 1 OF 1, DATED 12/8/76
2. FUSE CURVE. BUSSHANN # 50656-2, DATED 9/10/84.
3. W PENETRATION REPORT - PEN-TR-77-68, DATED 10/29/80 & 11/17/83



120/208V DIST. PNL PENET # 10AWG TIME-CURRENT CHARACTERISTIC CURVES

For SOUTH TEXAS PROJECT Fuse Links. In

8606160232-31

BASIS FOR DATA Standards SEE REFERENCES ABOVE 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. 20 SHEET 2 OF 2

Date 10/23/85

CURVE NO 31

FIGURE REV 0

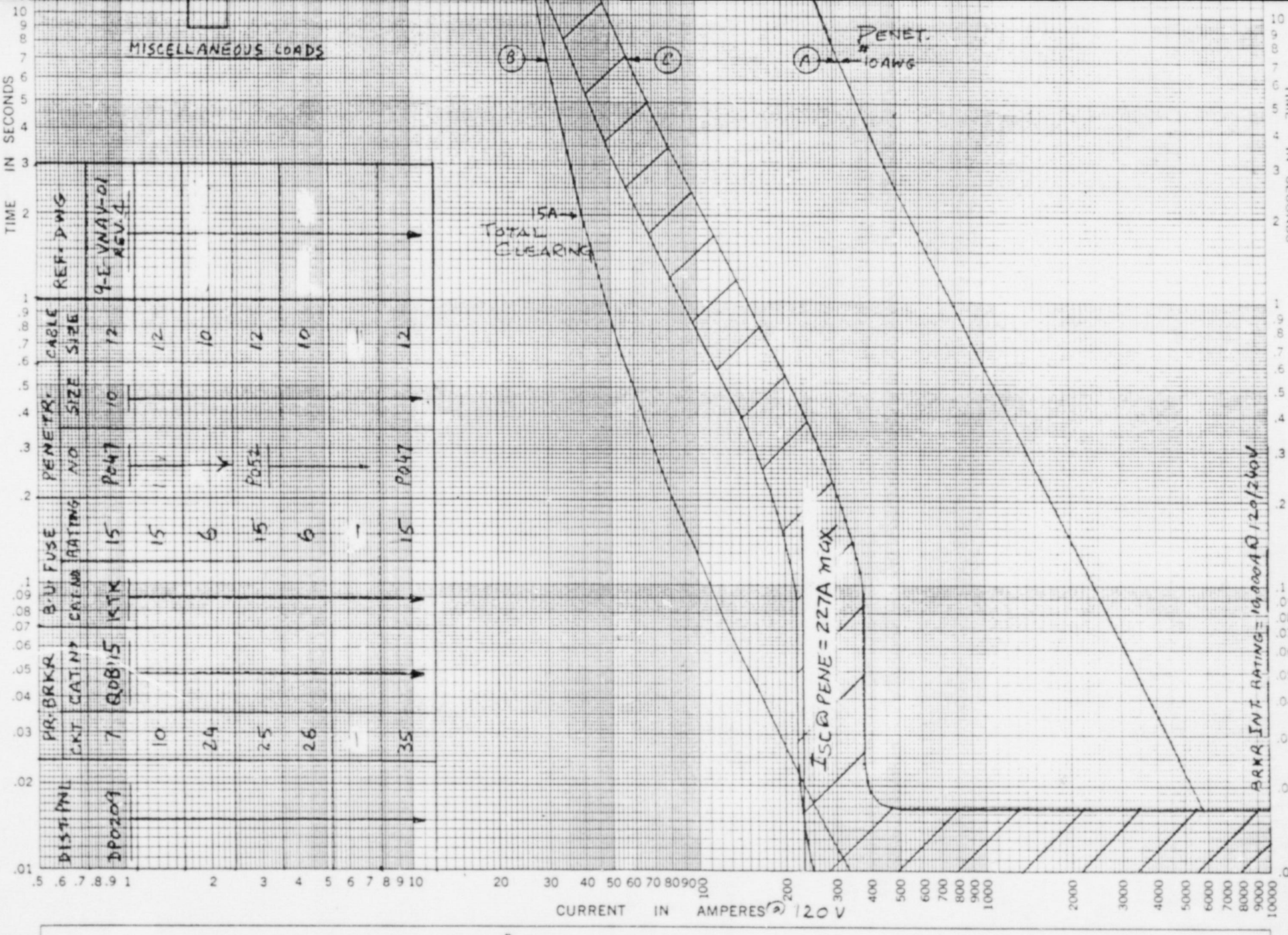
TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-31

CURRENT IN AMPERES

DIST. PNL	PR. BRKR		B.U. FUSE		PENETR		CABLE SIZE	REF. DWG
	CKT	CAT. NO.	CAT. NO	RATING	NO.	SIZE		
DPA435*	27	BQ1B015	KTK	15A	P018	10	12	9-E-VFAD-01 REV. 4
	28							
	29							
DPB435*	27				P032			
	28							
	29							
DPC435*	27				P055			
	28							
	29							
DPJ134	29	BQ1B020			P052			9-E-VNAT-01 REV. 5



120/208V DIST PNL PENET #10 AWG TIME-CURRENT CHARACTERISTIC CURVES 8606160232-32

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards SEE REFERENCES 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. 21

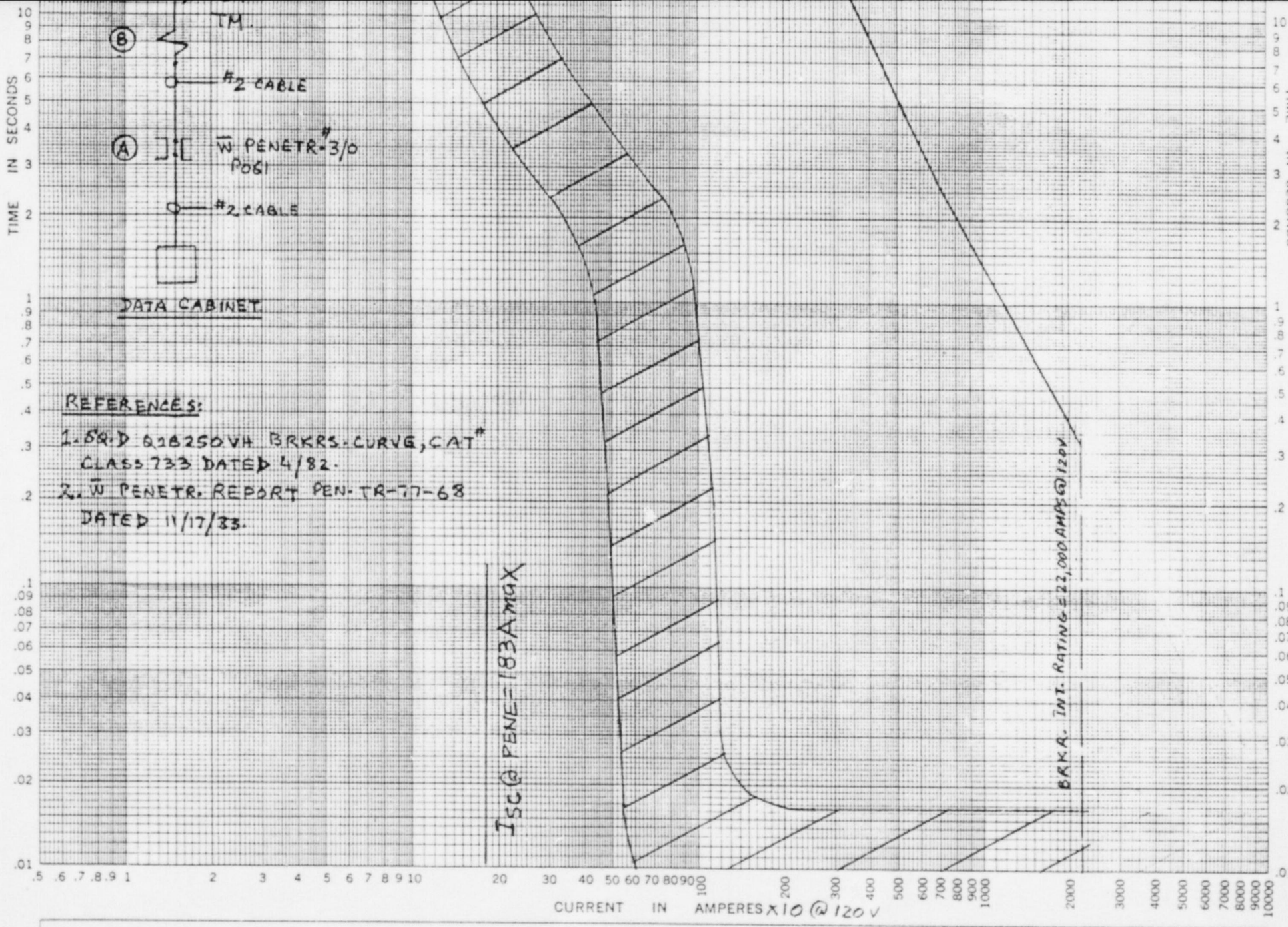
Date 11/1/85

FIGURE NO. 32

TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-32



REFERENCES:

1. SQ.D 6J1B250VH BRKRS-CURVE, CAT# CLASS 733 DATED 4/82.
2. W PENETR. REPORT PEN-TR-77-68 DATED 11/17/33.

120 V. DIST PNL PENET #3/0 TIME-CURRENT CHARACTERISTIC CURVES 8606160232-33

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards SEE REFERENCES 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. 22

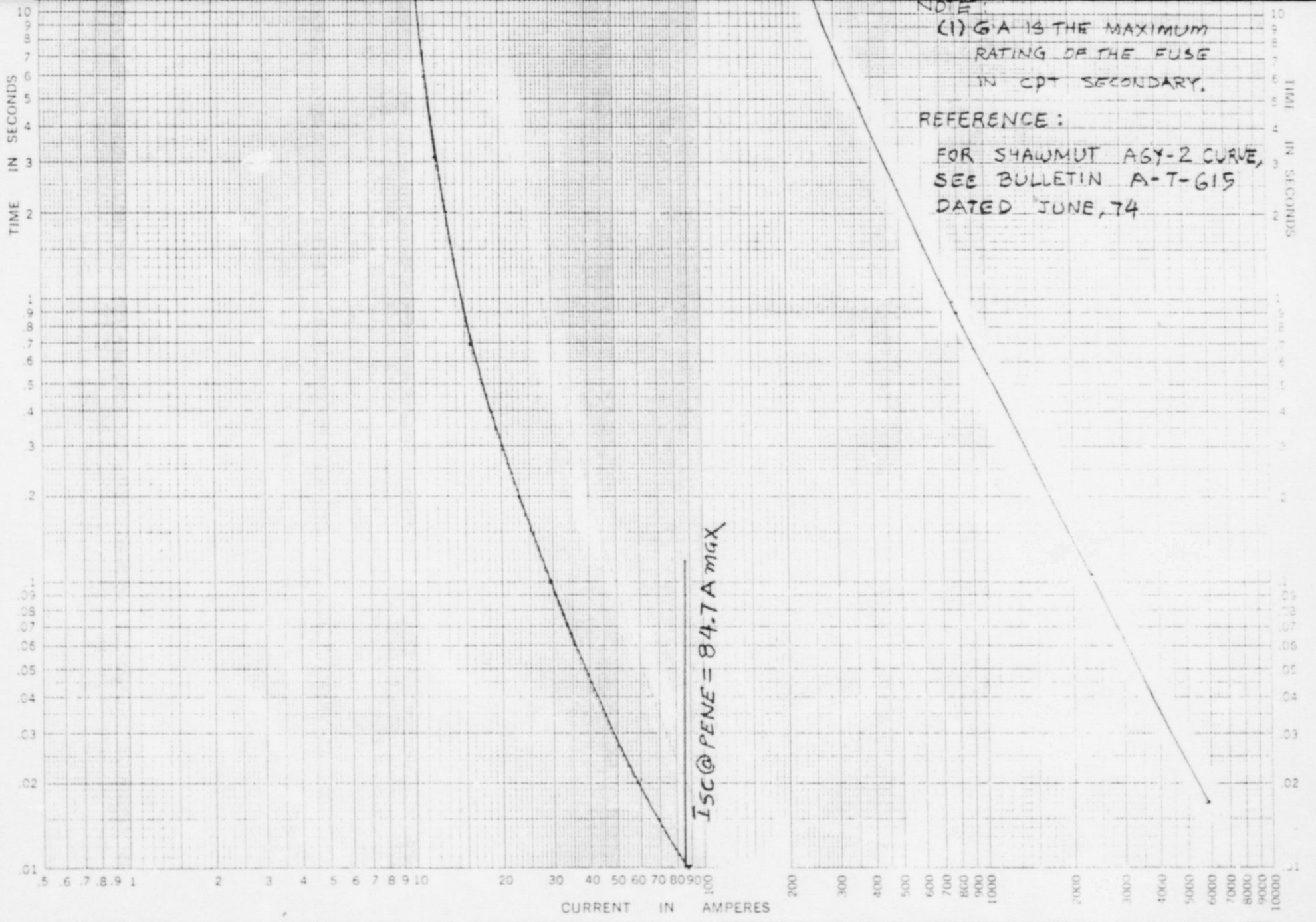
Date 11/1/85

CURVE #10.33

TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-33



CONT. PWR XFMR PENET PROTECTION TIME-CURRENT CHARACTERISTIC CURVES 8606160232-34

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards Dated

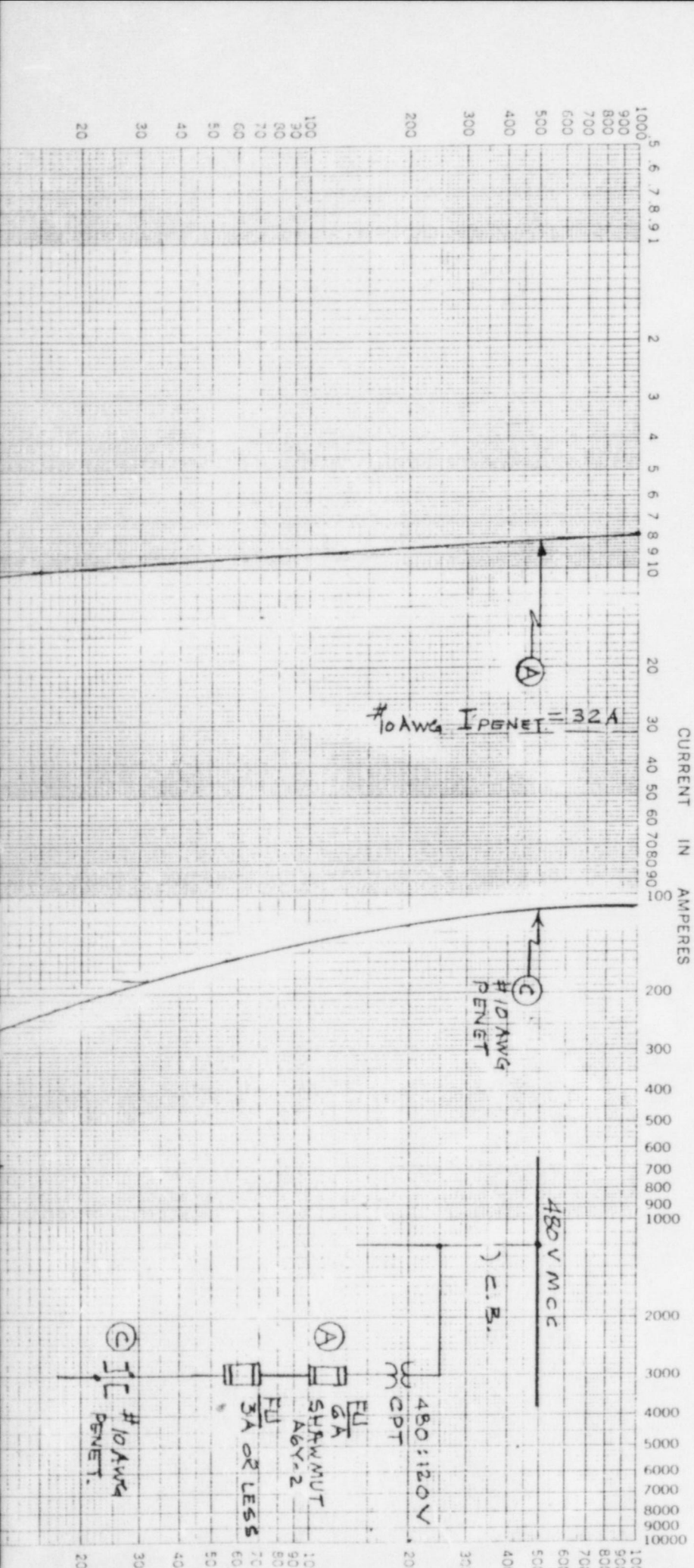
1. Tests made at Volts a-c at p.f., starting at 25C with no initial load

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

No. 23

Date

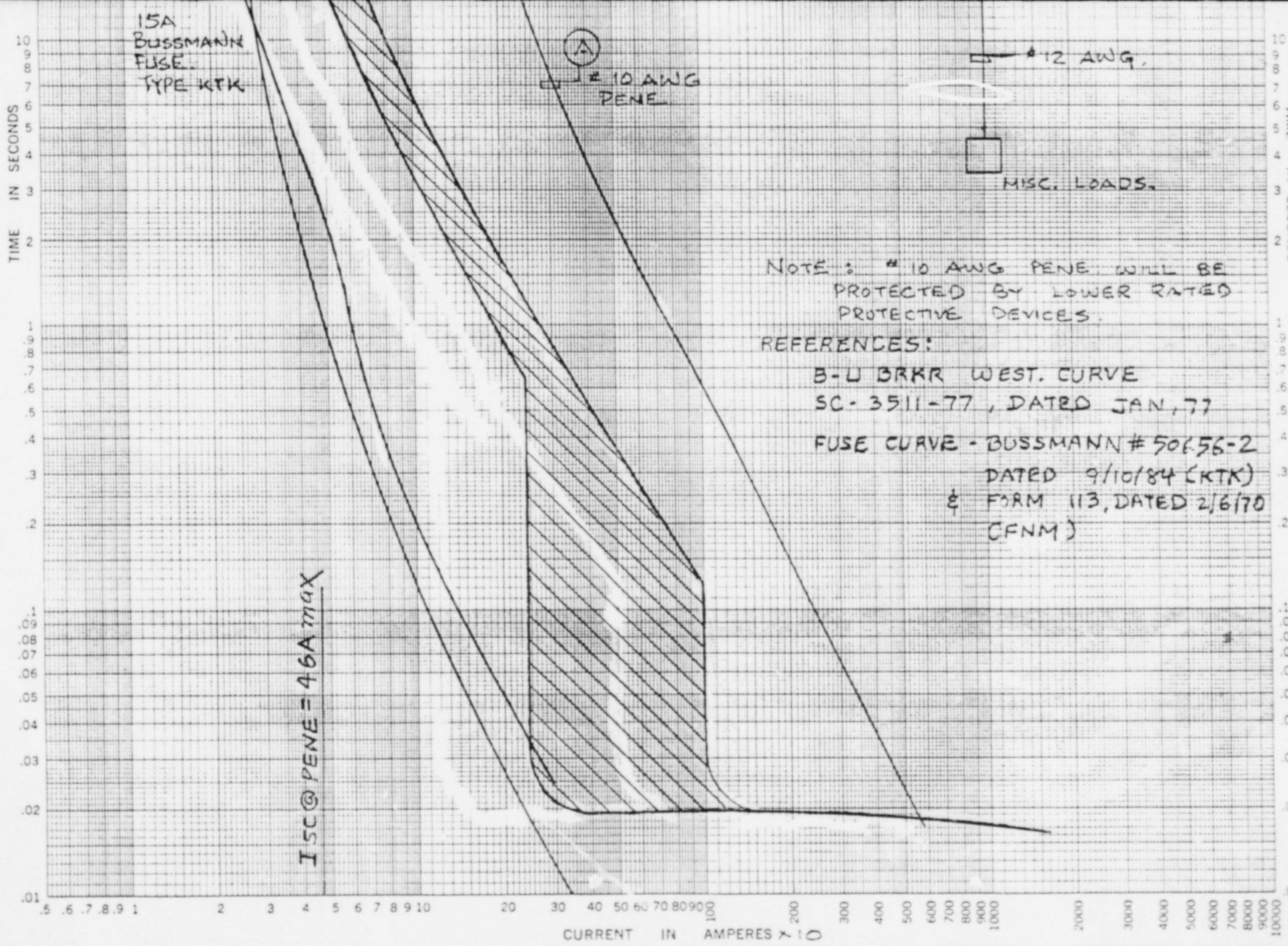
CURVE NO 34



TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-34



120VAC/125VDC CIRCUITS TIME-CURRENT CHARACTERISTIC CURVES 8606160232-35

For SOUTH TEXAS PROJECT 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 CAVE #10 35

No. 25

Date 12/10/85

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APERTURE
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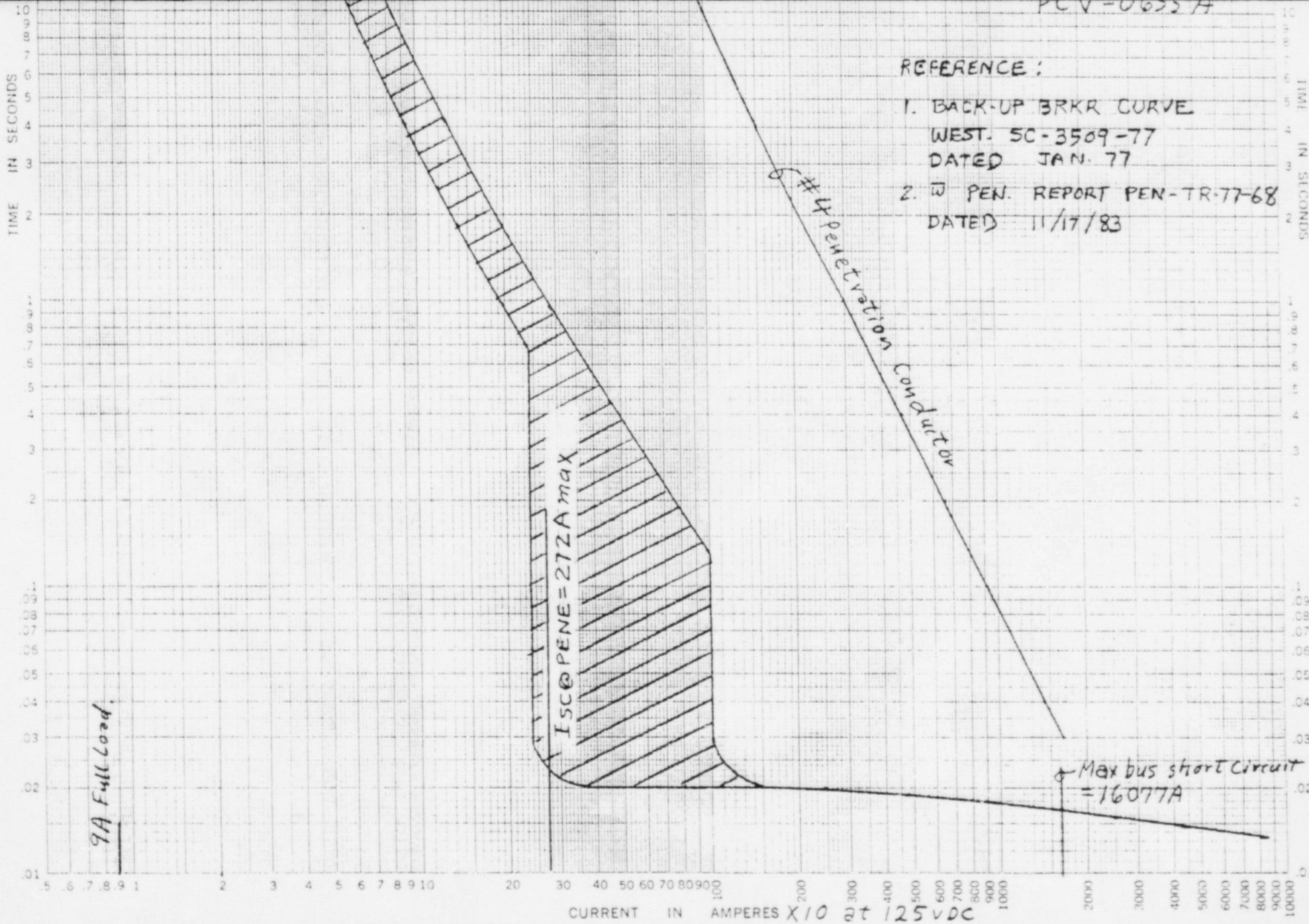
Also Available On
Aperture Card

8606160232-35

PCV-0655A

REFERENCE:

1. BACK-UP BRKR CURVE
   WEST. SC-3509-77
   DATED JAN. 77
2. W PEN. REPORT PEN-TR-77-68
   DATED 11/17/83



Reactor Coolant Pressurizer PR Valves - 1E TIME-CURRENT CHARACTERISTIC CURVES 8606160232-36

For SOUTH TEXAS PROJECT 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. 10

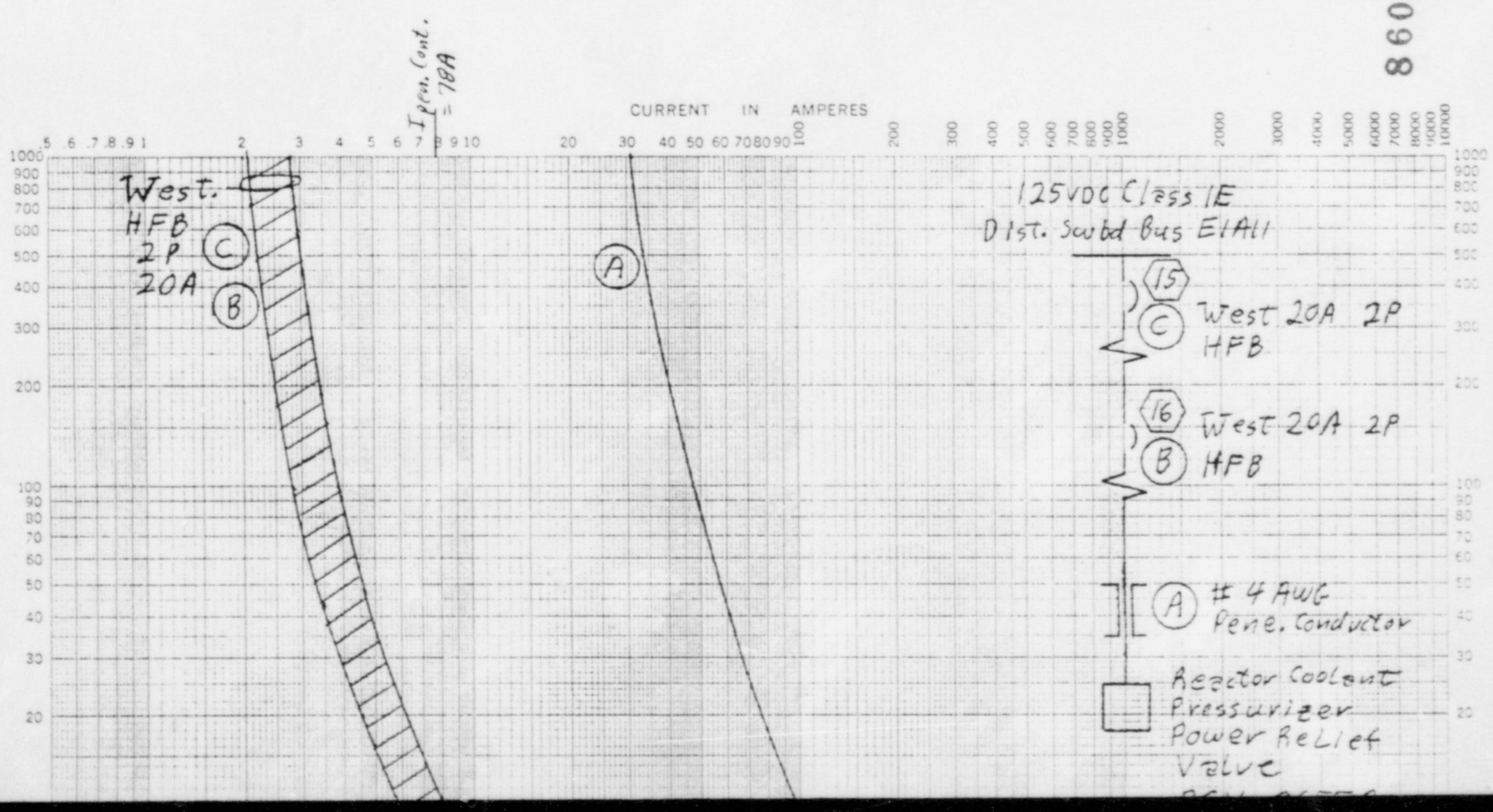
Date

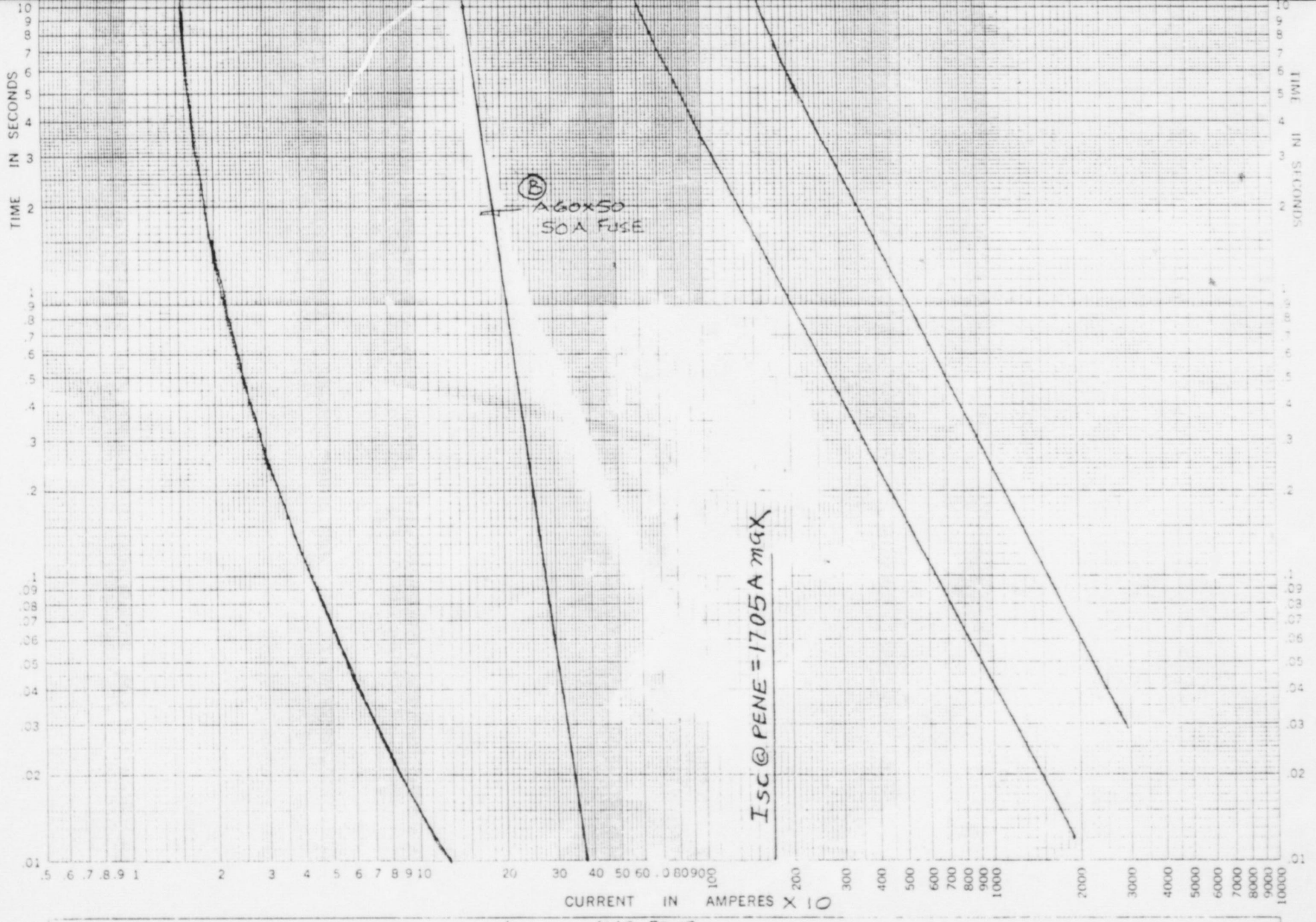
CURVE No 36

TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-36





CRD MECHANISM 10A, 50A FUSE Vs #6, #2 AWG PENE.
For SOUTH TEXAS PROJECT. TIME-CURRENT CHARACTERISTIC CURVES

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

8606160232-37

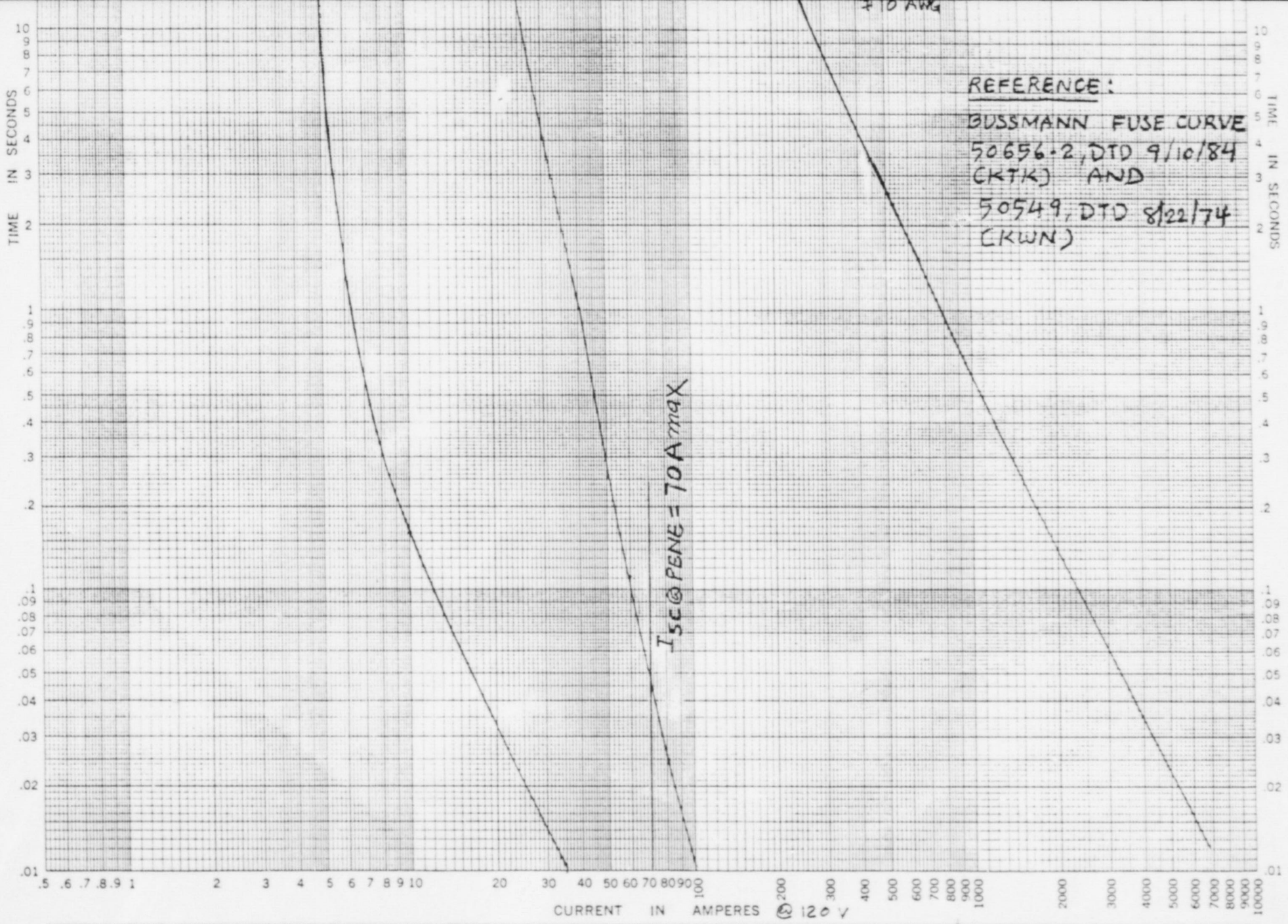
No. 24
Date 11/23/86

CURVE NO 37

TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-37



125VDC CONT CKT. PENET #10 AWG TIME-CURRENT CHARACTERISTIC CURVES **8606160232-38**

For SOUTH TEXAS PROJECT Fuse Links. In

BASIS FOR DATA Standards Dated

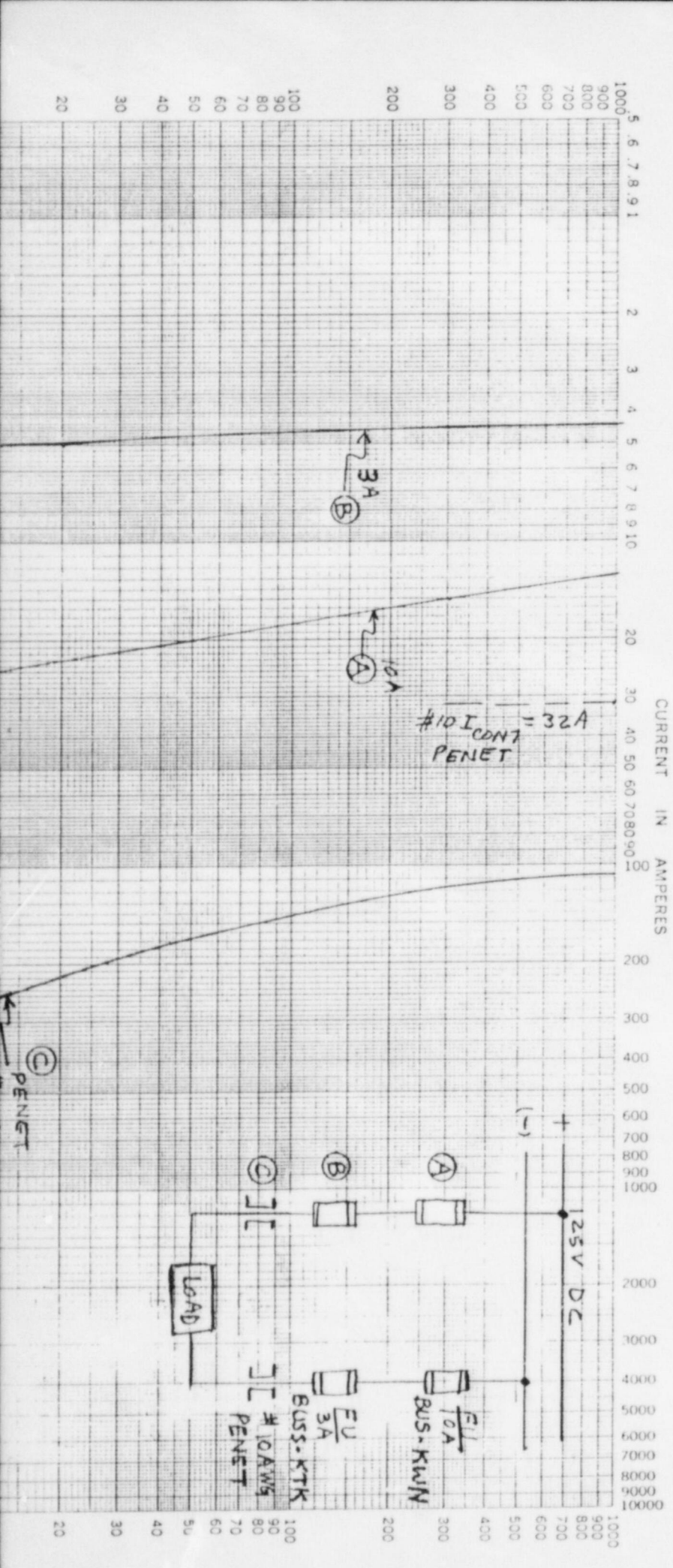
1. Tests made at Volts a-c at p-f., starting at 25C with no initial load

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

CURVE NO 38

No. 26

Date 12-19-85



TI
APERTURE
CARD

Also Available On
Aperture Card

8606160232-38