SCE&G
A SCANA Company

South Carolina Electric & Gas Company
P.O. Box 88
Jenkinsville, SC 29065
(803) 345-4344

Gary J. Taylor
Vice President
Nuclear Operations

January 30, 1995
Refer to: RC-95-0029

Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Attention: Mr. S. Dembek

Gentlemen:

Subject: VIRGIL C. SUMMER NUCLEAR STATION
DOCKET NO. 50/395
OPERATING LICENSE NO. NPF-12
ADDITIONAL INFORMATION REQUESTED BY NRC NOTICE OF DEVIATION 93-16-01

South Carolina Electric and Gas Company (SCE&G) hereby submits additional information in support of our position on the containment penetration overcurrent protection issue. This information is presented as attachments to this letter:

Attachment I	Circuits that are deenergized during normal operation or are isolated during an accident.
Attachment II	Circuits that are protected by fuses.
Attachment III	Circuits and equipment that are environmentally qualified for accident conditions.
Attachment IV	Typical coordination sheets for each of the four kinds of loads.

SCE&G maintains that there is no safety significance associated with this issue. All cables purchased during construction were purchased Safety Related and Environmentally Qualified for a 40 year installed life.

The 48 circuits in question are addressed as follows:

1. Personnel Airlock Lighting circuits (4) and the Polar Crane (1) are not energized during normal operation. The non-safety Reactor Building Cooling Unit Fans (4) are tripped and locked out by a safety injection (SI) signal for a LOCA event and therefore, are deenergized during an accident. The penetrations serving these loads are deenergized during accident conditions and are not subject to these postulated faults.

2. The Pressurizer heater circuits (26) are protected by series fuses. The simple construction and characteristics of fuses lend themselves to the fail safe condition of opening on faulted conditions and provide extremely reliable and conservative protection. The breach of containment integrity caused by damage to one of these penetrations is highly unlikely.

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3. The electrical cables in containment connecting the electrical penetrations to the equipment are all procured to the same 10CFR 50.49 qualification standards whether used to connect safety related or non-safety related equipment. The safety related Reactor Building Cooling Units (4) and the Hydrogen Recombiners (4) are Environmentally Qualified to 10CFR 50.49 standards to withstand post accident conditions and to reliably function without degradation of electrical characteristics.

4. The D. G. O'Brien Electrical Penetrations are constructed of conductors hermetically sealed in glass. The penetrations are qualified to withstand 350°C without the loss of electrical integrity and were tested to 500°C without the loss of mechanical integrity. This characteristic is represented on the penetration protection curves as a penetration conductor Damage Curve (I squared T). The cables connected to these penetrations are either of the same or lesser ampacity rating than the penetration conductors. The cables would be expected to fail prior to the degradation of the penetration conductors and the hermetic glass seal would prevent the loss of containment integrity.

5. The penetration time current plots are attached for groups of equipment. The plots indicate the penetration damage curve by conductor size at 350°C; the primary and back-up protective device curves; the short circuit current for faults when supplied by the Diesel Generator (minimum); and the short circuit current for faults when supplied by the transmission grid (maximum).

6. All circuit breakers protecting both safety related and non-safety related equipment are maintained and tested to the same standards by our Electrical Maintenance program regardless of safety classification or service of the breaker. The circuit breakers are environmentally and seismically qualified to withstand the accident condition in the area in which they are located. Cables for both safety related and non-safety related applications are procured as safety related 10CFR 50.49 qualified to avoid possible traceability of documentation concerns during and after construction installation. The safety related equipment, Hydrogen Recombiners and RBCU safety related motors are qualified to 10CFR 50.49 standards for environmental conditions in the Reactor Building during accident conditions.

7. The penetration protection time current plots indicate that back-up protection is provided for the maximum fault current. Even though back-up breaker protection is not provided over the entire range of possible overload conditions, the penetrations re protected by the back-up breaker to approximately 1600 Amperes for greater than 100 seconds. The field cables connecting the penetrations to both safety related and non-safety related equipment are environmentally qualified to provide reasonable assurance of integrity of the cable under accident conditions in not causing a faulted condition. The safety related equipment required to function during or after an accident has been qualified to function in accident conditions without loss of integrity. The non-safety related CRDM Cooling Fans (4) and RB Compartment Cooling Fan (1) are not required to operate during an accident. The penetration field cables are either the same or less ampacity or less than the conductor ampacity of the penetration, therefore, the cable would be expected to fail prior to any mechanical damage to the penetration seal which has been tested to 500°C without any loss of seal integrity. Based on the above,

it is reasonable to conclude that the penetration protection provided by the plant design is acceptable as installed.

SCE&G appreciates the opportunity to present this additional information. Should you have any questions, please call Mr. Philip Rose at (803) 345-4052 at your convenience.

Very truly yours,

Gary J. Taylor

PAR/GJT/nkk
Attachments (4)

c: O. W. Dixon
R. R. Mahan (w/o Enclosures)
R. J. White
S. D. Ebneter
P. Fillion
General Managers
S. G. Carroll
S. F. Fipps
NRC Resident Inspector
J. B. Knotts Jr.
J. I. Byrd
NSRC
Central File System
RTS (IE 940026, IE 930016, URI 920407)
File (815.01)

CIRCUITS THAT ARE DEENERGIZED DURING NORMAL OPERATION OR ARE ISOLATED DURING AN ACCIDENT

PENETRATION NO.	CIRCUIT NO. IRC	CIRCUIT NO. ORC	PRIMARY PROTECTION	BACK-UP PROTECTION
Personnel Airlock Lighting				
202/RB202	PSK12X		ITE-EH	Buss KTN-R15
202/RB202	PS3X		Sq D-FA	Gould A2Y15-1
303/RB303	PSK11X		ITS-EH	Buss KTN-R15
303/RB303	PSE4X		Sq D-FA	Gould A2Y15-1
Polar Crane		XCR0004		
805/XRP0004	FHL2X	FHL1X	K600s	K1600s
Non-Safety Related RBCU Cooling Fans MFN0096A, B, C, D				
727/XRP0011	AHL122XA	AHL121XA	K1600s	K3000s
501/XRP0007	AHL142XB	AHL141XB	K1600s	K3000s
726/XRP0010	AHL162XA	AHL161XA	K1600s	K3000s
808/XRP0014	AHL182XB	AHL181XB	K1600s	K3000s

CIRCUITS THAT ARE PROTECTED BY FUSES (PZR HEATERS)

PENETRATION NO.	CIRCUIT NO. IRC	CIRCUIT NO. ORC	PRIMARY PROTECTION	BACK-UP PROTECTION
809/XRP0020	RCJ212XA	RCJ211X	KTS-R-80 (1)	JJS-500
	RCJ222XA	RCJ221X	KTS-R-80 (2)	JJS-500
	RCJ232XA	RCJ231X	KTS-R-80 (3)	JJS-500
	RCJ242XA	RCJ241X	KTS-R-80 (4)	JJS-500
	RCJ252XA	RCJ251X	KTS-R-80 (5)	JJS-500
	RCJ262XA	RCJ261X	KTS-R-80 (6)	JJS-500
	RCJ272XA	RCJ271X	KTS-R-80 (7)	JJS-500
810/XRP0021	RCJ122XB	RCJ121XB	KTS-R-80 (1)	KTU-800
	RCJ132XB	RCJ131XB	KTS-R-80 (2)	KTU-800
	RCJ142XB	RCJ141XB	KTS-R-80 (3)	KTU-800
	RCJ152XB	RCJ151XB	KTS-R-80 (4)	KTU-800
	RCJ162XB	RCJ161XB	KTS-R-80 (5)	KTU-800
	RCJ172XB	RCJ171XB	KTS-R-80 (6)	KTU-800
	RCJ182XB	RCJ181XB	KTS-R-80 (7)	KTU-800
	RCJ192XB	RCJ191XB	KTS-R-80 (8)	KTU-800
	RCJ202XB	RCJ201XB	KTS-R-80 (9)	KTU-800
815/XRP0022	RCJ22XA	RCJ21XA	KTS-R-80 (1)	KTU-800
	RCJ32XA	RCJ31XA	KTS-R-80 (2)	KTU-800
	RCJ42XA	RCJ41XA	KTS-R-80 (3)	KTU-800
	RCJ52XA	RCJ51XA	KTS-R-80 (4)	KTU-800
	RCJ62XA	RCJ61XA	KTS-R-80 (5)	KTU-800
	RCJ72XA	RCJ71XA	KTS-R-80 (6)	KTU-800
	RCJ82XA	RCJ81XA	KTS-R-80 (7)	KTU-800
	RCJ92XA	RCJ91XA	KTS-R-80 (8)	KTU-800
	RCJ102XA	RCJ101XA	KTS-R-80 (9)	KTU-800
	RCJ112XA	RCJ111XA	KTS-R-80 (10)	KTU-800

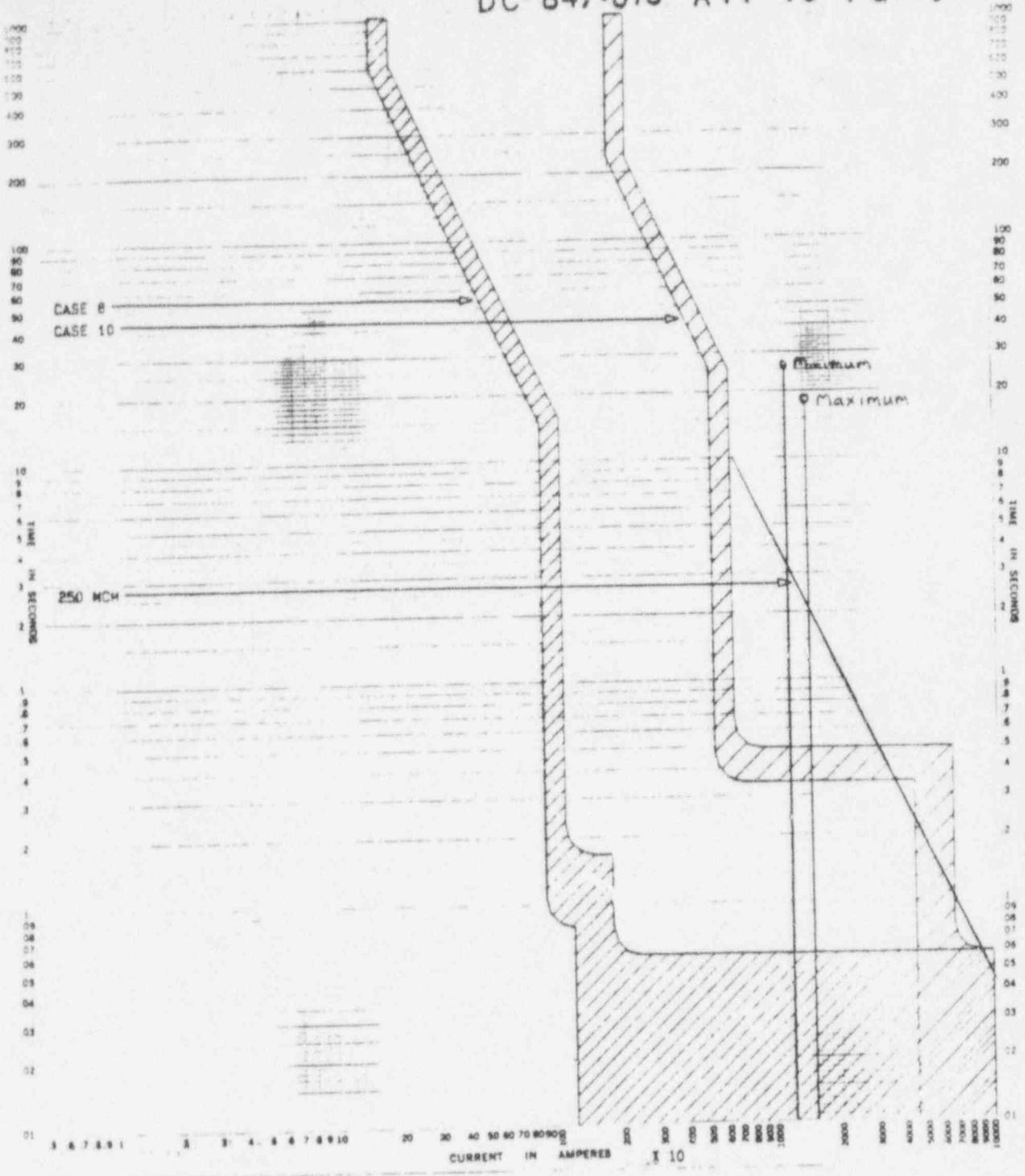
CIRCUITS AND EQUIPMENT THAT ARE E IRONMENTALLY QUALIFIED FOR HARSH CO IONS

PENETRATION NO.	CIRCUIT NO. IRC	CIRCUIT NO. ORC	RIMARY PROTECTION	BACK-UP PROTECTION
Hydrogen Recombiners	XHR0004A			
727/XRP0011	HRJ8A	HRJ7A	K600s	K1600s
726/XRP0010	HRJ2A	HRJ1A	K600s	K1600s
	XHR0004B			
501/XRP0007	HRJ12B	HRJ11B	K600s	K1600s
808/XRP0014	HRJ18B	HRJ17B	K600s	K1600s
Safety Related RBCUs	MFN0096A, B, C, D			
727/XRP0011	AHL112A	AHL111A	K1600s	K3000s
501/XRP0007	AHL132B	AHL131B	K1600s	K3000s
726/XRP0010	AHL152A	AHL151A	K1600s	K3000s
808/XRP0014	AHL172B	AHL171B	K1600s	K3000s

TYPICAL COORDINATION SHEETS
FOR EACH OF THE FOUR KINDS OF LOADS

1. Safety Related RBCU Motors and Hydrogen Recombiners
2. Pressurizer Heaters
3. Reactor Building Compartment Fan
4. CRDM Fan Motors

THESE DRAWINGS ARE THE BEST QUALITY AVAILABLE

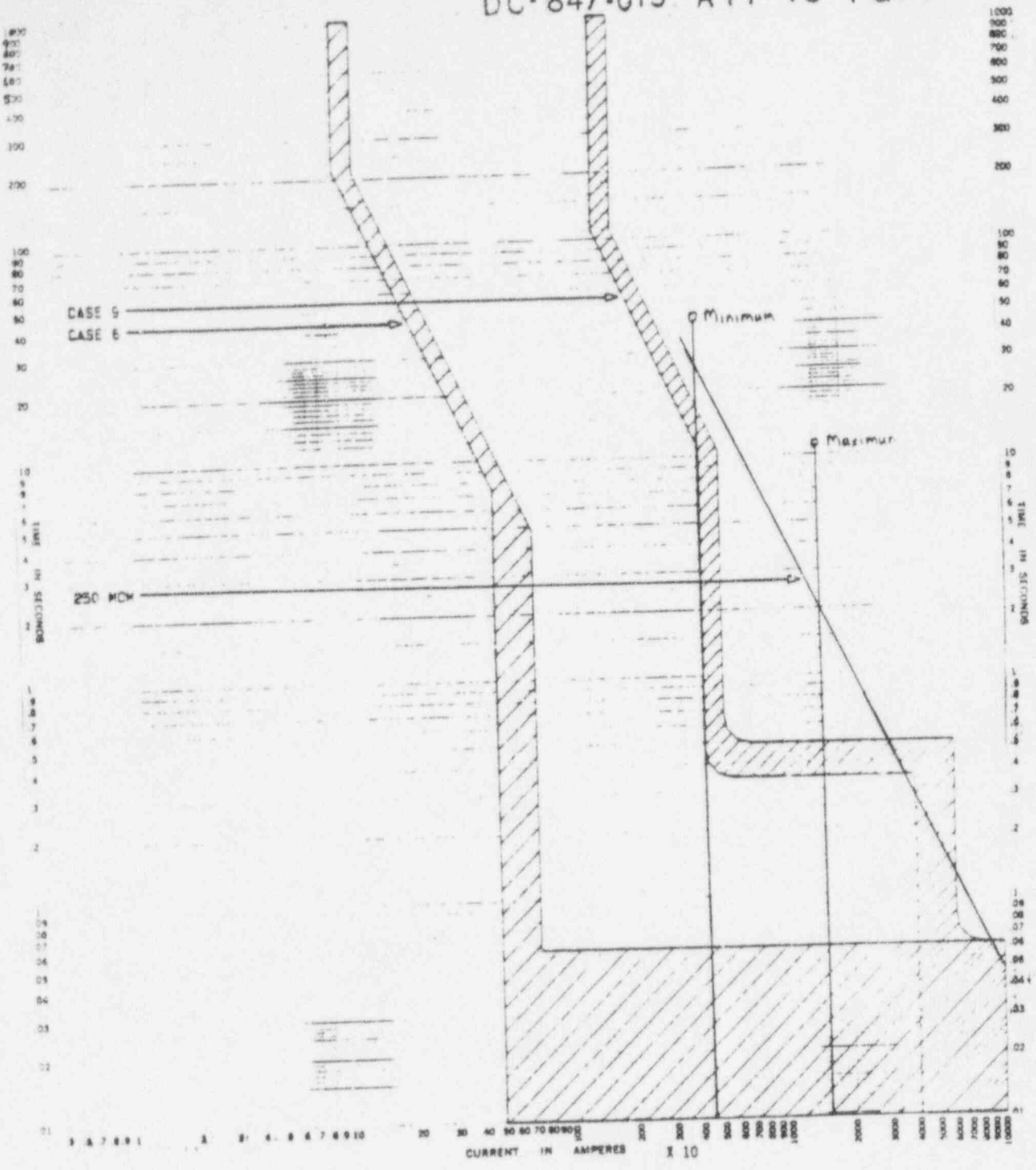


Record 1

Cases 8 and 10

ITE Circuit Breakers
3 15 92

MFN 97A,B,C,D

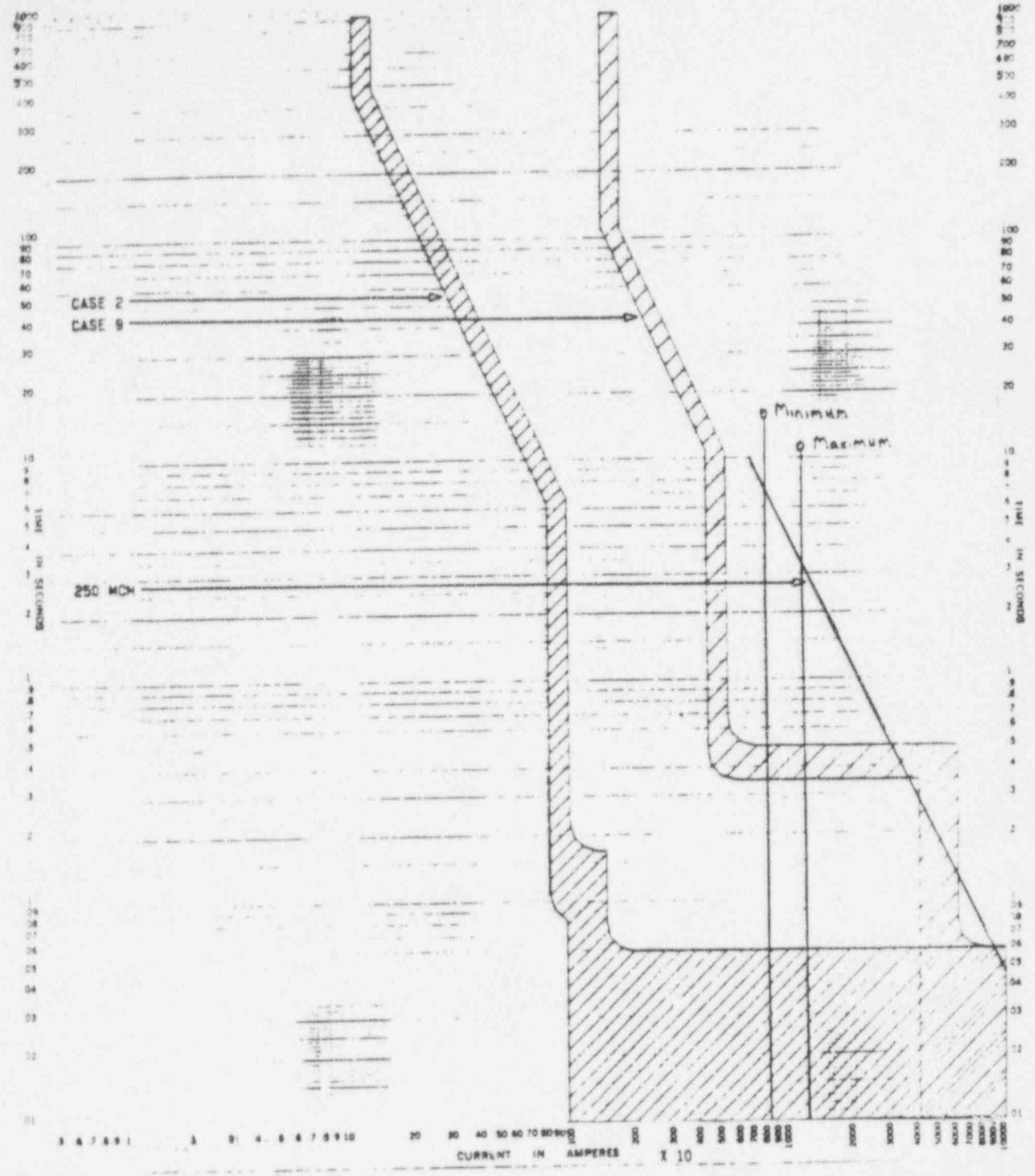


Record 3

Cases 8 and 9

ITE Circuit Breakers
3 15 92

XHR4A,B

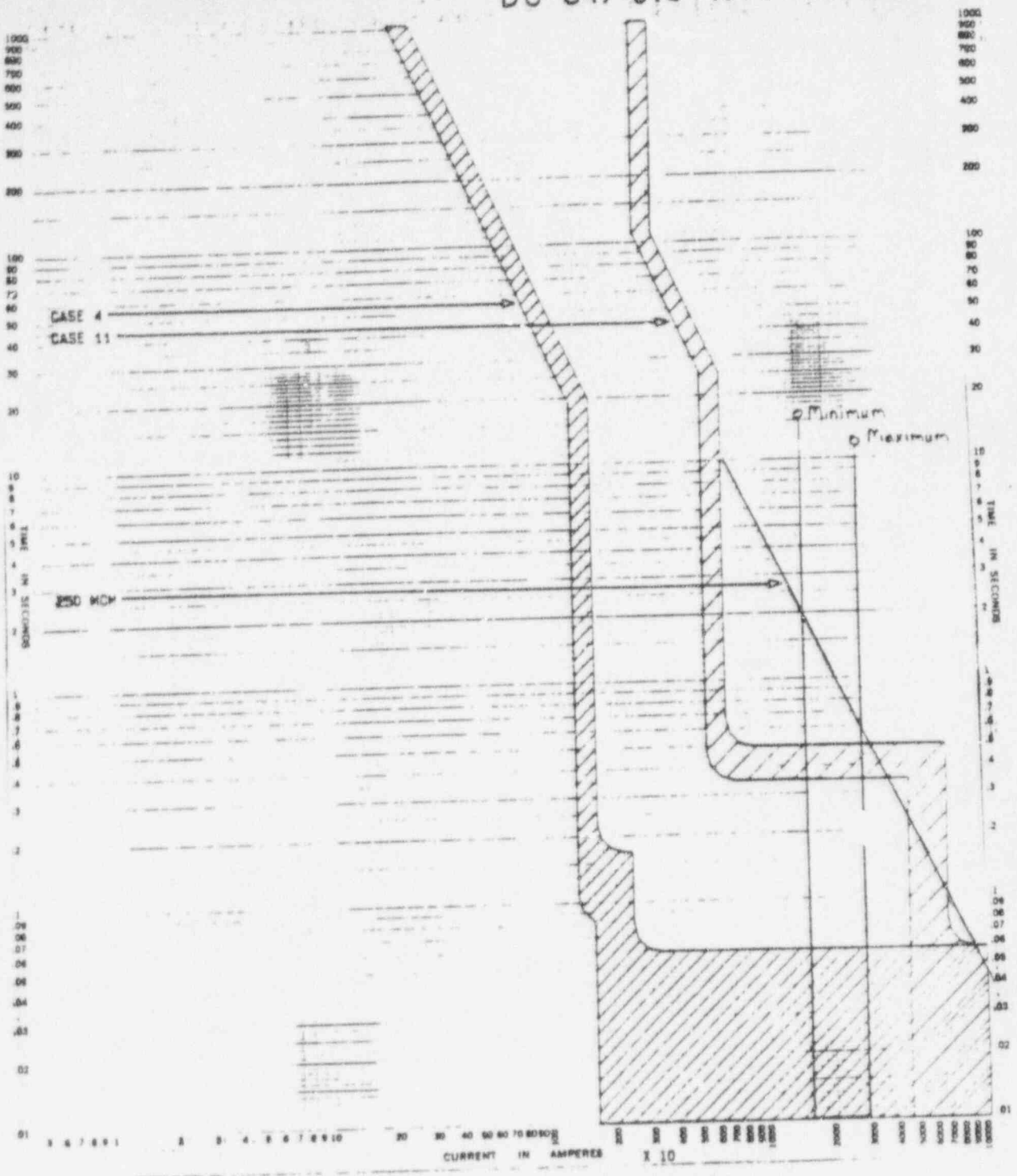


Record 14

Cases 2 and 9

ITE Circuit Breakers
3 15 92

XFN94

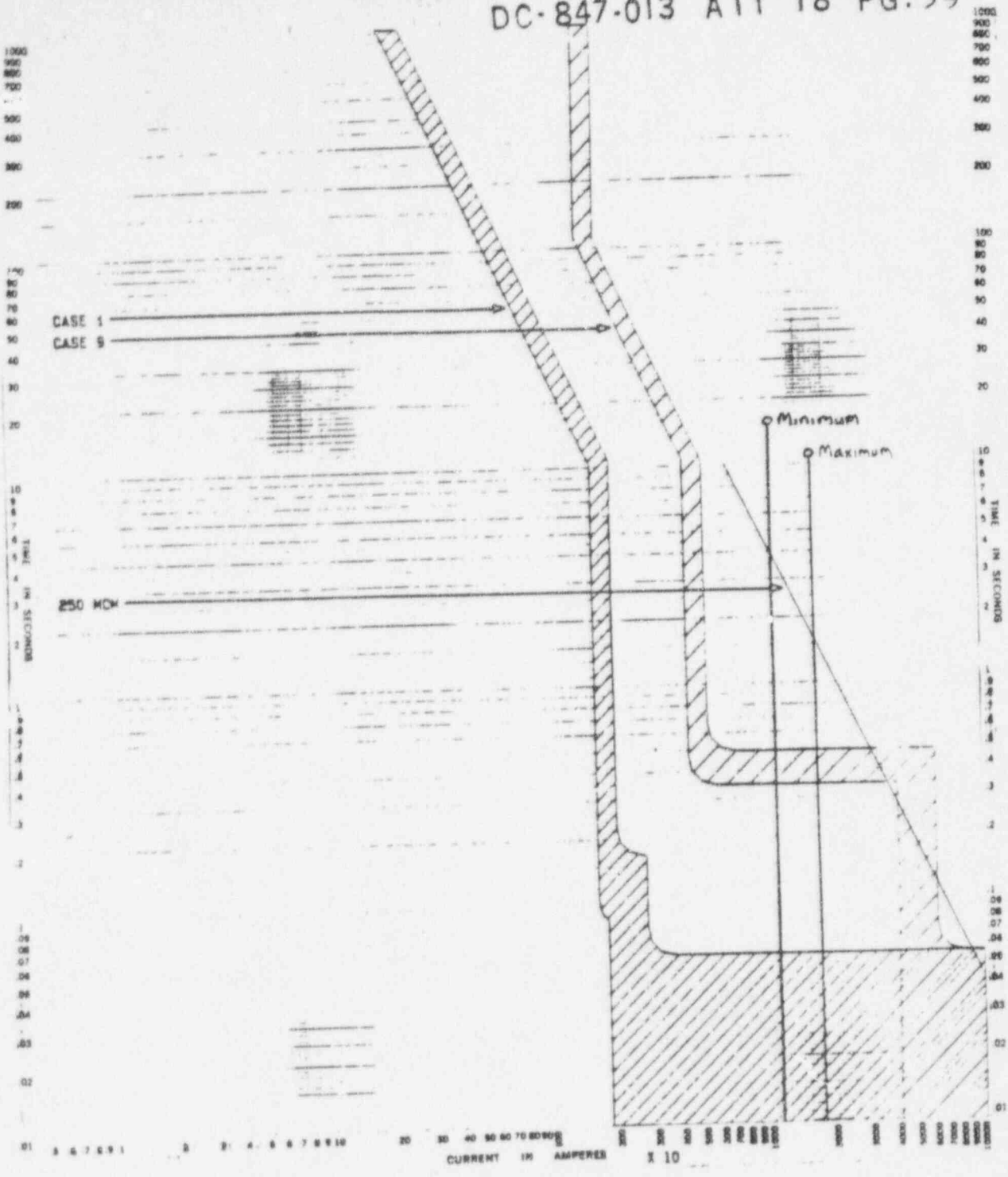


Record 17

Cases 4 and 11

ITE Circuit Breakers
3 15 92

XFNJ67B

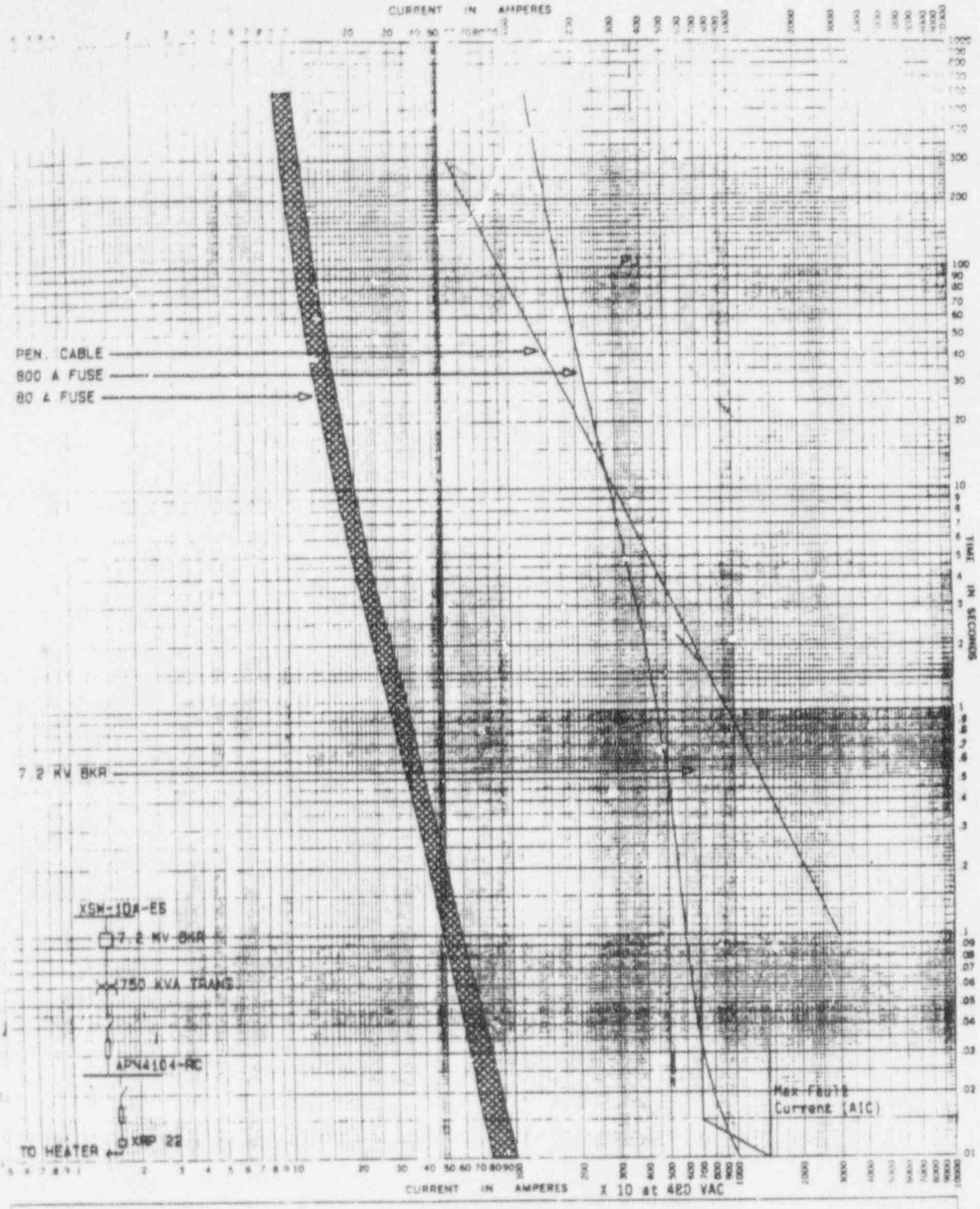


Record 18

Cases 1 and 9

ITE Circuit Breaker
3 15 92

XFN167 A,C,D



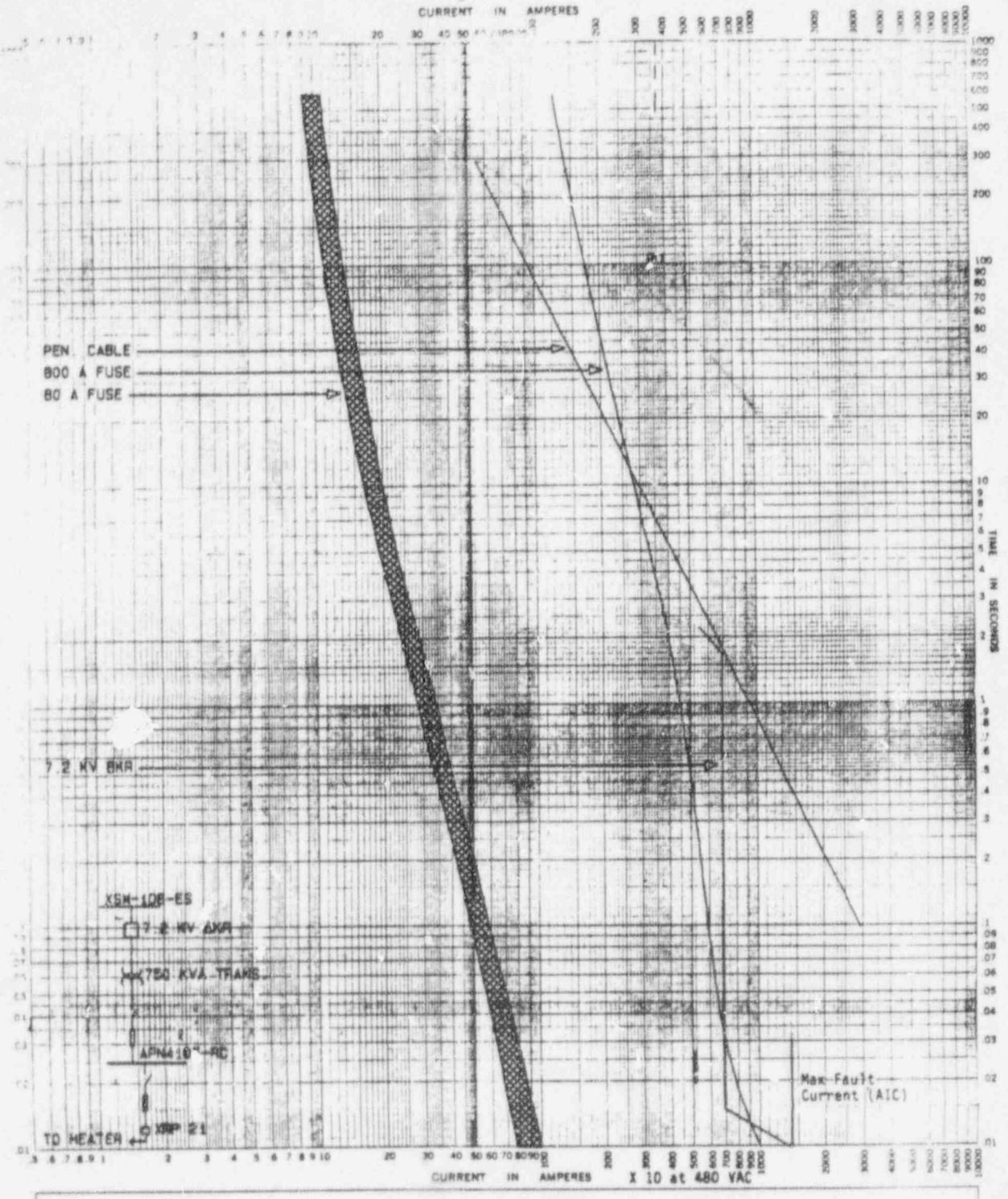
TIME-CURRENT CHARACTERISTIC CURVES

For APN 4104-RC
Fuse Links In
Dated
BASIS FOR DATA Standards
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

Prepared: Shawn A Lee 7-23-91
Verified: Karen A Clausen 7-23-91

Graph # 1

DC-847-013
Attachment 17
Page 2 of 3



TIME-CURRENT CHARACTERISTIC CURVES

For APN 4105-RC 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 shown be

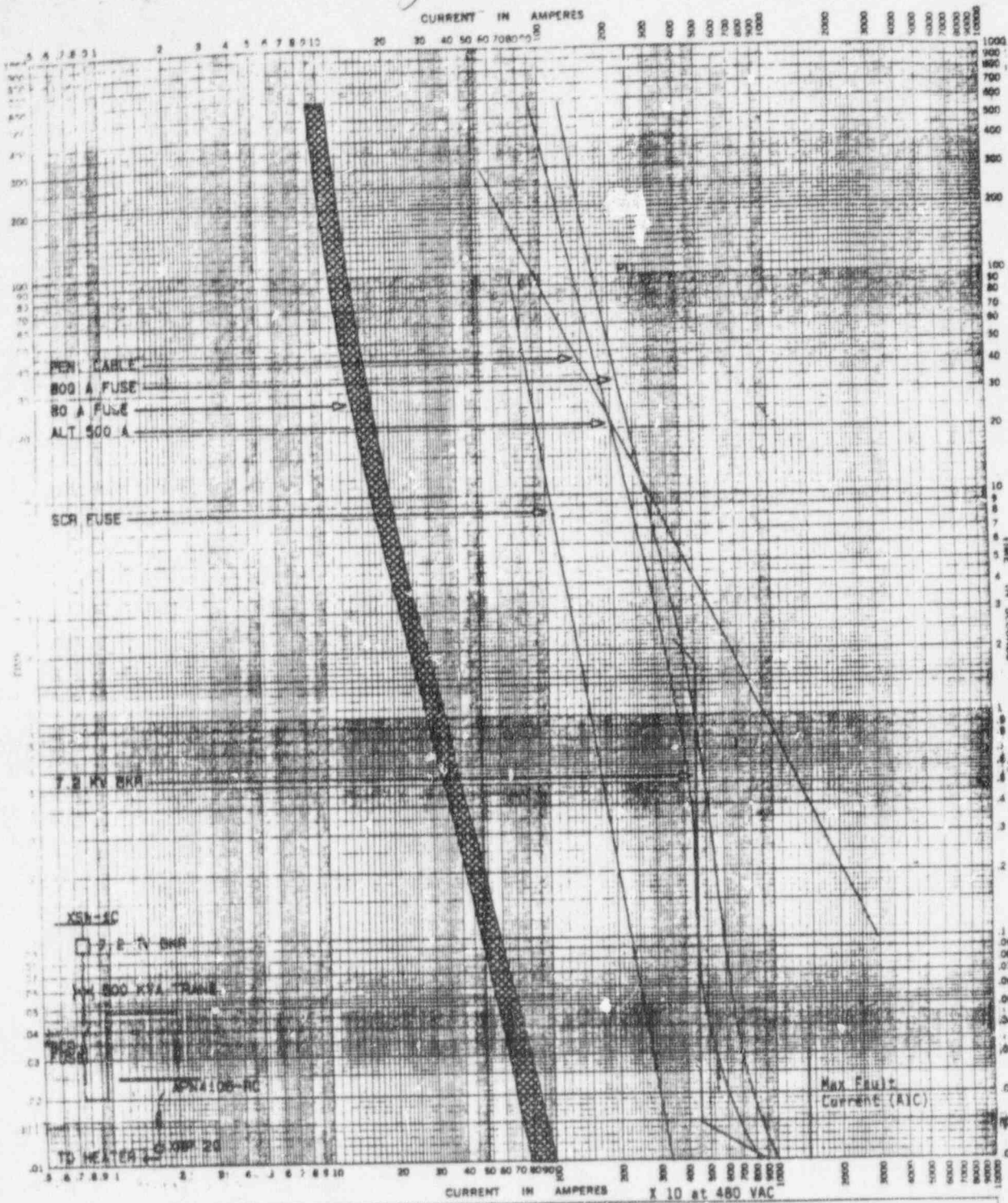
No.

Date

Prepared: Steven A. Lott 7-23-91

Verified: Karen J Clausen 7-23-91

Graph # 2



TIME-CURRENT CHARACTERISTIC CURVES

For APN 4106-RC — Fuse Links, In

BASIS FOR DATA Standards — Plotted

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

K-E TIME-CURRENT CHARACTERISTIC KEUFFEL & ESSER CO. 46 3258

Prepared: Steven A Lott 7-23-91

Verified: Kevin J O'Connor 7-23-91

Graph # 3