GULF STATES UTILITIES COMPANY

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File No. G9.5, G9.8.6.1

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commisson
Washington, D. C. 20555

Dear Mr. Denton:

River Bend Station Unit 1
Docket No. 50-458

Enclosed for your review are Gulf States Utilities Company (GSU) responses to Request for Additional Information identified by the Nuclear Regulatory Commission's Power Systems Branch (PSB). This letter supplements information contained in docketed correspondence from J. E. Booker to H. R. Denton dated December 30, 1983 and February 10, 1984. Attachment 1 of this letter summarizes the Staff request identified in meeting between GSU and PSB dated February 15, 1984. The following enclosures contain the actual written changes to the FSAR text including all tables and figures. These changes will be incorporated into the FSAR in a future amendment.

Sincerely,

J. E. Booker

J. E. Booker
Manager-Engineering
Nuclear Fuels & Licensing
River Bend Nuclear Group

JEB/JEP/je

Attachments

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A PDR

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Attachment 1

Listed below are responses to requests for additional information. This completes GSU's responses to the items discussed at our February 15, 1984 meeting.

1. Communication Systems - Enclosure 1 provides our revised response to Staff request for additional information number 430.65.

2. Lighting Systems - Enclosure 2 provides our revised response to Staff request for additional information number 430.68.

3. I^2t Curves - Enclosure 3 provides our revised response to Staff request for additional information number 430.26. Please note that the curves are provided here in Enclosure 4 as docketed information, but will not be included in the FSAR.

ENCLOSURE 1

QUESTION 430.65 (9.5.2)

The information regarding the onsite communications system (Section 9.5.2) does not adequately cover the system capabilities during transients and accidents. Provide the following information:

a. Identify all working stations on the plant site where it may be necessary for plant personnel to communicate with the control room or the emergency shutdown panel during and or following transients and/or accidents (including fires) in order to mitigate the consequences of the event and to attain a safe cold plant shutdown.

b. Indicate the maximum sound levels that could exist at each of the above identified working stations for all transients and accident conditions.

c. Indicate the types of communication systems available at each of the above identified working stations.

d. Indicate the maximum background noise level that could exist at each working station and yet reliably expect effective communication with the control room using:

   1. The page party communications systems, and

   2. Any other additional communication system provided that working station.

e. Describe the performance requirements and tests that the above onsite working stations communication systems will be required to pass in order to be assured that effective communication with the control room or emergency shutdown panel is possible under all conditions. 11

f. Discuss the protective measures taken to assure a functionally operable onsite communication system. The discussion should include the considerations given to component failures, loss of power, and the severing of a communication line or trunk as a result of an accident or fire.

RESPONSE

The design criteria for River Bend Station does not require communications ~~The response to this request is provided in revised Section 9.5.2.~~ with personnel outside the main control room (or the remote shutdown panel) to effect safe shutdown. 11

c. Fire fighting

d. Recovery

4. Fire Protection Training and Drills

a. Duties and responsibilities

b. Outline training course requirements

c. Drill planning guides

d. Critique of drills

e. Documentation

These procedures utilize the guidance contained in National Fire Protection Association (NFPA) Standards 4, 4A, 6, 7, 8, 27, and 802.

The Quality Assurance program, as it applies to the fire protection systems, is discussed in Section 9A.3.4 of Appendix 9A.

Fire protection related to emergency planning is discussed under the appropriate areas of Section 13.3.

9.5.2 Communication Systems

9.5.2.1 Design Bases

Communication systems are provided for reliable intra-plant, intra-site, and plant-to-offsite communication to meet the requirements of operation and maintenance of the units. These systems have redundancy or diversity to ensure communications during all modes of plant operation including emergencies. However, these communications systems are not required to prevent or mitigate the consequences of design basis events, a fire, or security threats. Physical and electrical independence are maintained between the systems. Power sources for each system are listed in Table 9.5-1.

The maximum sound level that could exist in the area of the communications systems' stations is 90 dB as specified by OSHA requirements, except for the main control room which has a maximum permissible sound level of 65 dB. Speakers in expected high

TABLE 9.5-6

WORK / EQUIPMENT AREA	COMMUNICATION SYSTEM PRIVATE BRANCH EXCHANGE (PBX)	PAGE-PARTY/PUBLIC ADDRESS (PP/PA)	BATTERY-POWERED PORTABLE INTERCOM	UHF HAND-HELD PORTABLE RADIO	SOUTH CENTRAL BELL DEDICATED DIRECT LINE	BASE RADIO STATION CONTROL
MAIN CONTROL ROOM	X	X	X		X	X
RMT SHUTDOWN PNL DIV I	X	X	X		X	X
RMT SHUTDOWN PNL DIV II	X	X	X		X	X
SSW PUMP HOUSE		X	X	X		
DIESEL GENERATOR DIV I	(1)	X	X	X		
DIESEL GENERATOR DIV II	(1)	X	X	X		
DIESEL GENERATOR DIV III	(1)	X	X	X		
STDBY SWGR ROOM DIV I		X	X			
STDBY SWGR ROOM DIV II		X	X			
STDBY BATTERY ROOM DIV I	(1)		X	X		
STDBY BATTERY ROOM DIV II	(1)			X		
RHR PUMP A	(1)	X	X	X		
RHR ROOM B	(1)	X	X	X		
RHR ROOM C	(1)	X	X	X		
RCIC TURBINE/PUMP ROOM	(1)	X	X	X		
HPCS PUMP ROOM	(1)	X	X	X		
LPCS PUMP ROOM	(1)	X	X	X		

Note (1)= PBX Extention in approximate area (low noise site)

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ENCLOSURE 2

QUESTION 430.68 (9.5.3)

Table 9.5-2 list the areas of the plant in which emergency lighting is installed. For all areas listed, with the exception of the control room, emergency lighting consists of battery powered incandescent fixtures rated for 8 hours of operation. Expand the lighting section of the FSAR to include a discussion of how lighting will be provided for these areas in the event of a sustained loss of offsite ac power (in excess of 8 hours and up to 7 days), or provide the rationale why lighting is not required in these areas. Include in your discussion what, if any, other areas would require lighting during a sustained loss of ac power, and how it would be provided.

RESPONSE

The response to this request is provided in revised Sections 9.5.3.1 and 9.5.3.2, ~~and in~~ revised Table 9.5-2, and in revised Figure 9.5-9.

As indicated, the design criteria used for River Bend Station does not require personnel to continuously occupy areas outside the main control room (or the remote shutdown panel) to effect safe shutdown. Other areas in Table 9.5-2 are provided with battery pack lighting to facilitate evacuation of personnel.

Any additional lighting required for short excursions into the plant will be provided to personnel by portable equipment (e.g., hand-held flash-lights and/or lanterns).

room. Batteries furnishing power to these UPSs are sized for a minimum of 2 hours. Emergency dc lighting, supplied from the battery pack system, is provided in standby generator areas, standby switchgear rooms, standby service water pumphouse, Class 1E battery rooms, standby motor control centers and load centers, remote shutdown panel rooms and areas required for egress and exit of buildings. The battery packs are designed to sustain the illumination level for a period of 8 hours.

9.5.3.2 System Description

Outdoor area lighting is controlled by light-sensing devices. High-pressure sodium fixtures are used for general yard and roadway lighting. They are supplied by 240-V or 480-V ac, single-phase power. Fluorescent and incandescent fixtures are supplied by 120-V/240-V ac, single-phase , 3-wire power. The station lighting systems are divided into three systems (Fig. 9.5-9):

1. Station lighting System 1 (normal) receives power from the normal service buses of the station service ac power distribution system described in Section 8.3.1.

   In the main control room the normal ac lighting system feeds a manually controlled backup ac lighting subsystem with approximately 20 percent of the main control room lighting fixtures. These fixtures can be manually transferred to one of the available Class 1E buses supplied by a standby diesel generator, which can furnish power for up to 7 days, or to a non-Class 1E source of power. It is normally connected to one of the Class 1E buses.

2. Station lighting System 2 (safety ac lighting) receives power from the normal uninterruptible power supply (UPS) system and is confined to the main control room. Twenty percent of the total fixtures in the main control room are supplied from System 2.

3. Station lighting System 3 (emergency dc) receives power from the local battery packs, which are normally fed from the normal ac system. Local battery packs are installed in the following areas as indicated in Table 9.5-2:

   a. Main control room (egress)
   b. Standby diesel generator building
   c. Class 1E switchgear rooms

d. Standby service water pump house
e. Class 1E Battery rooms
f. Standby MCC's and load centers
g. Remote shutdown panel rooms
h. Means of egress and building exits

The main control room and remote shutdown panels are the only areas requiring continuous lighting in excess of 8 hours which is provided as described above.

In case of failure of the normal ac lighting system, exit signs and means of egress throughout the station are illuminated by System 3. In the event of failure of the normal ac lighting system and a loss of offsite power, portable lighting (battery-powered lanterns) is available for all areas of the plant.

9.5.3.3 Safety Evaluation

In all Seismic Category I structures, the lighting fixtures and conduits are seismically supported. In the main control room, they are seismically supported in accordance with structural requirements for control room design: lighting over the main control and computer areas is supplied from a louvre. All ceiling lighting and fixtures are the fluorescent strip type and are securely mounted above and independent of the louvres. The remaining areas are illuminated by recessed fluorescent fixtures in an acoustical suspended ceiling. The fixtures are double suspended, i.e., from the suspended ceiling and from the structure.

All battery packs are a sealed type and are seismically supported. These battery packs are designed to give sustained illumination for 8 hr following a loss of normal power.

Because the remote shutdown panel rooms and 20 percent of the main control room fixtures are connected to a Class 1E bus, special design considerations have been made. From the Class 1E bus to and including the power receptacle, the circuit is designed as Class 1E with two independent overcurrent protection devices installed in the circuit to ensure protection of the Class 1E portion of the circuits. From and including the plug, it is treated as a non-Class 1E system, with additional safety protection as follows:

1. The transformer load is limited to 75 percent of its maximum rating.

2. The circuit breaker installed on secondary windings of the transformer trips at 100 percent of the transformer rating.

3. No load other than the lighting fixtures is connected to this circuit.

4. Wiring for this system is run in separate conduits.

9.5.3.4 Inspection and Testing Requirements

Normal operation of the lighting system results in easy identification of malfunctions, and continuous routine maintenance and housekeeping ensures reliability. Battery pack units are provided with local test switches to simulate loss of normal ac power. These are tested monthly to ensure operability of the system components.

9.5.4 Diesel Generator Fuel Oil Storage and Transfer System

The plant is provided with two standby diesel generators and one HPCS power supply diesel generator operating on No. 2D diesel fuel oil, with each engine supplied by a separate diesel generator fuel oil storage and transfer system. The standby and HPCS diesel generator fuel oil storage and transfer systems are shown in Fig. 9.5-2.

9.5.4.1 Design Bases

Each diesel generator fuel oil storage and transfer system is in accordance with the following criteria:

1. The diesel generator fuel oil storage and transfer systems are designed to Safety Class 3 and Seismic Category I requirements.

2. The equipment mounted on the diesel generator is designed and fabricated to the manufacturer's quality assurance standards and Seismic Category I requirements.

3. The diesel generator fuel oil piping, pumps, valves, and oil tanks are designed, constructed, and tested in accordance with ASME Boiler and Pressure Vessel Code, Section III, Safety Class 3.

4. The system design incorporates sufficient redundancy to prevent a malfunction or failure of any active or passive component from impairing the capability of the system to supply fuel oil to at least two of the three diesel engines.

TABLE 9.5-2

ILLUMINATING LEVEL AND TYPE OF
FIXTURES USED IN PLANT AREAS NECESSARY
FOR SAFE SHUTDOWN OR EVACUATION OF PERSONNEL

		Normal Lighting		Emergency Lighting		
	Area	Fixture	FC	Source	Fixture	FC
1.	Main control room	Fluorescent	125 (Main console) 100 (Computer)	UPS Standby* Battery pack	Fluorescent Fluorescent Incandescent	25 (a) 25 (b) 0.5 (c)
2.	Standby switch-gear rooms	Fluorescent	35	Battery pack	Incandescent	3
3.	Class 1E Battery Rooms	Fluorescent (enclosed & casketed)	20	Battery pack	Incandescent	3
4.	Standby diesel generator areas	Fluorescent	20	Battery pack	Incandescent	3
5.	Standby service water pumphouse	Fluorescent	20	Battery pack	Incandescent	3
6.	Standby MCC's and load centers	Fluorescent	20	Battery pack	Incandescent	3
7.	Remote shutdown panel rooms	Fluorescent	100	Battery pack Standby *	Incandescent (LTR)	5 (LTR)
8.	Means of egress and exit (all buildings)	Fluorescent or incandescent	5	Battery pack	Incandescent	0.5

a. 20 percent of fixtures connected to UPS.
b. 20 percent of fixtures connected to standby source and switchable to other sources by administrative control.
c. means of egress and exit.
* Area lighting required for safe shutdown

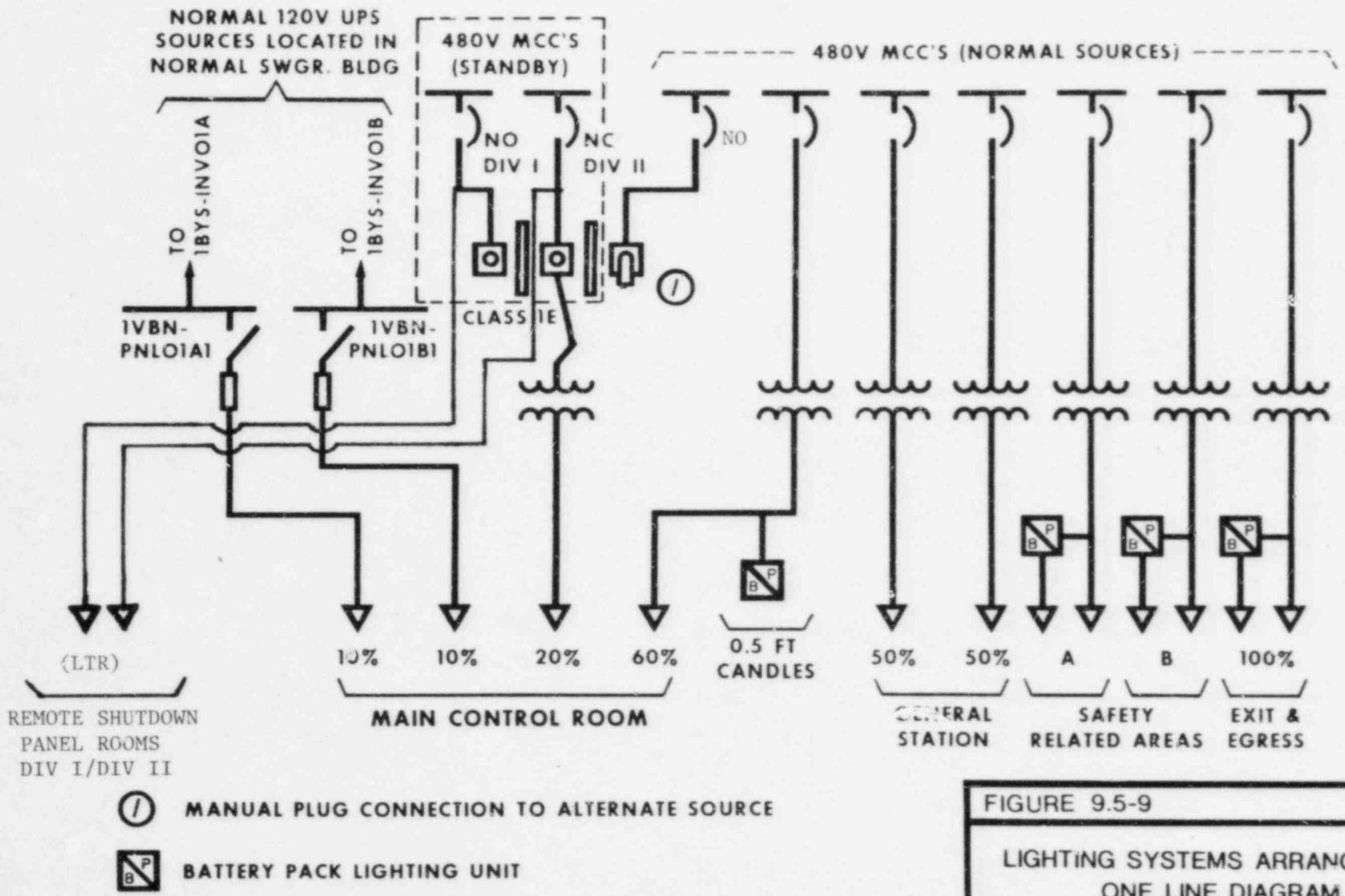

FIGURE 9.5-9

LIGHTING SYSTEMS ARRANGEMENT ONE LINE DIAGRAM

RIVER BEND STATION

FINAL SAFETY ANALYSIS REPORT

ENCLOSURE 3

QUESTION 430.26 (8.3.1)

Your discussion of electrical penetrations in Section 8.3.1.1.4.3 of the FSAR does not provide sufficient information for evaluation. We require the following requirements of IEEE standard 279-1971 must be satisfied with regard to the protection of the electrical penetrations:

1. The system shall, with precision and reliability automatically disconnect power to the penetration conductors when currents through the conductors exceed the established protection limits.

2. All primary and backup breaker overload and short circuit protection systems shall be qualified for the service environment including seismic. However the seismic qualification for non-class 1E circuit breaker protection systems should as a minimum assure that the protection systems remain operable during an operating basis earthquake. In addition, the non-class 1E circuit breaker and protection system shall be of high quality.

3. The circuit breaker protection system trip set points and breaker coordination between primary and backup protection shall have the capability for test and calibration. Provisions for test under simulated fault conditions should be provided. For designs where protection is provided by a combination of a breaker and a fuse or two fuses in series, provisions shall be provided for non-destructive testing of fuses.

4. No single failure shall cause excessive current in the penetration conductors which will degrade the penetration seal.

5. Where external control power is needed for tripping breakers, signals for tripping primary backup breakers shall be independent, physically separated and powered from separate sources.

Provide response to address the above and additionally provide time-current coordination curves for each size penetration. These curves shall include I^2t penetration and cable rating curves for instantaneous, long and short time overcurrent trips provided by primary and backup protective devices. Include a single line diagram which shows circuit

configuration and breaker coordination in addition to the provided curves.

RESPONSE

The response to this request is provided in revised Sections 8.3.1.1.4.3 and 8.3.1.1.5.1. In addition, typical I^2t and breaker coordination curves ~~will be provided in new Figures 8.3-13a through 8.3-13e in March 1984.~~ have been provided in separate docketed correspondence dated March 7, 1984.

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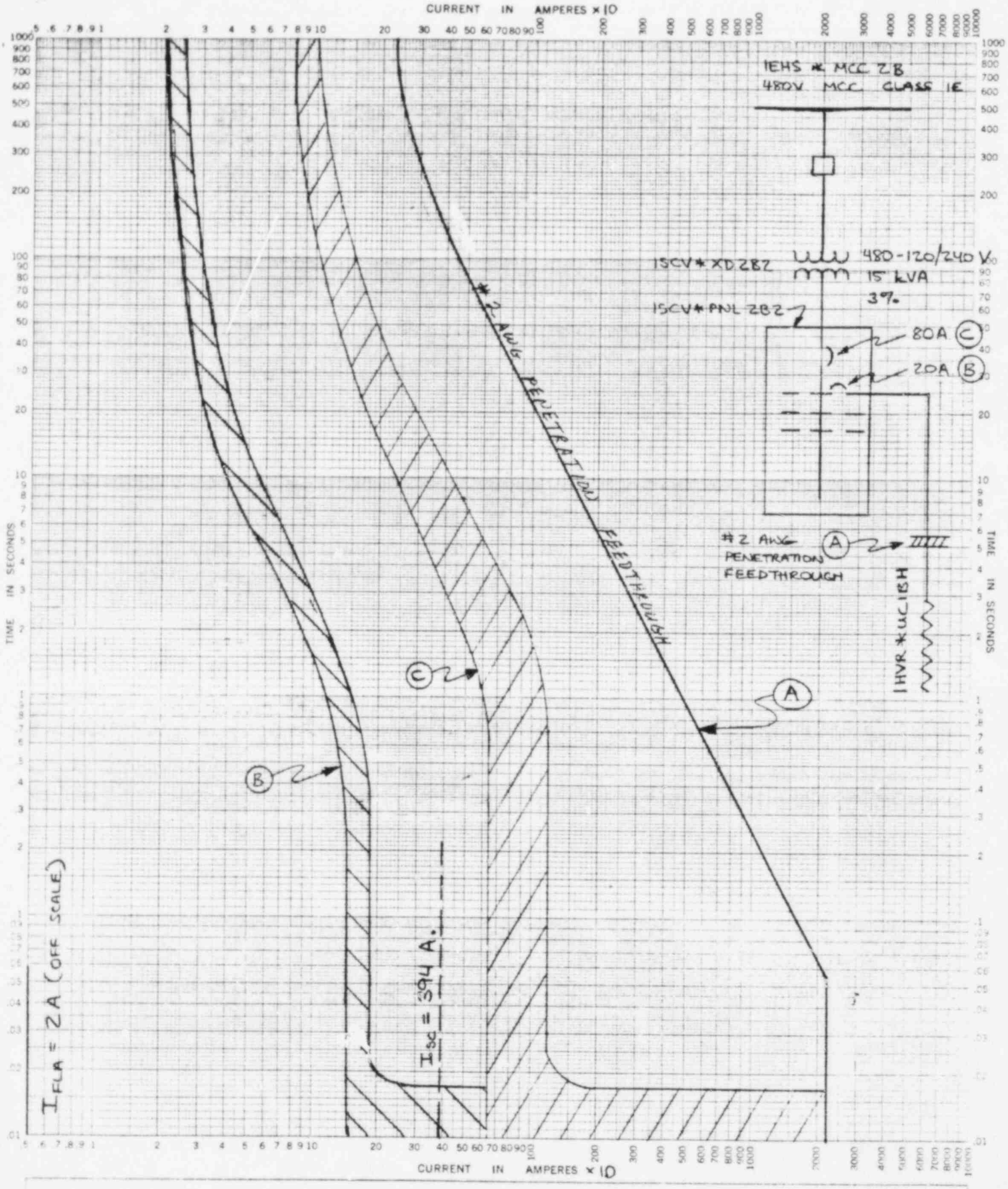
ENCLOSURE 4



TIME-CURRENT CHARACTERISTIC CURVES

For _____ Fuse Links In _____

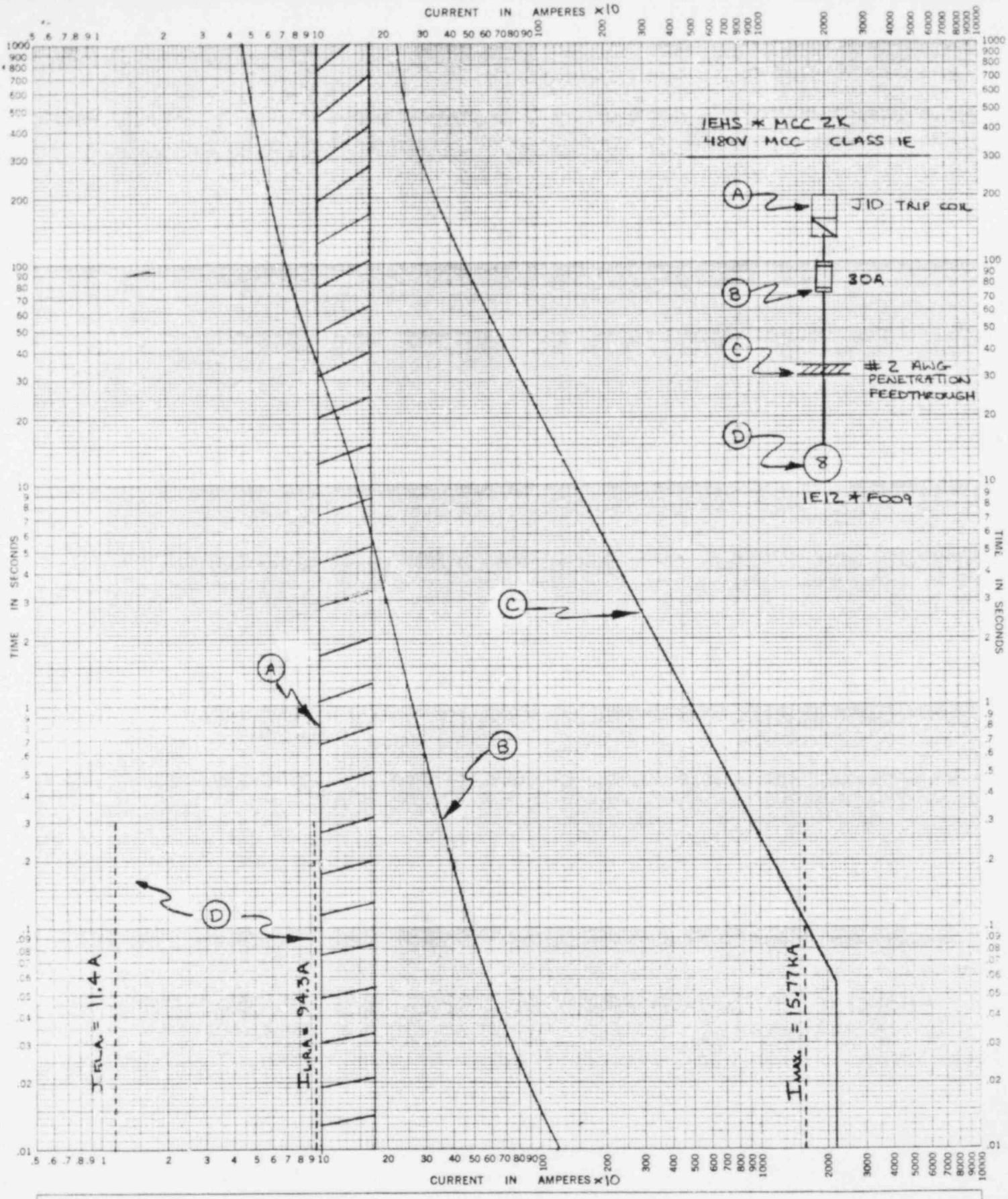
BASIS FOR DATA Standard _____ Dated _____

1. Tests made at _____ Volts a-c at _____ p-f., starting at 250 with no initial load _____

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

No. FIG. 8.3-13a

Date _____



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 _____

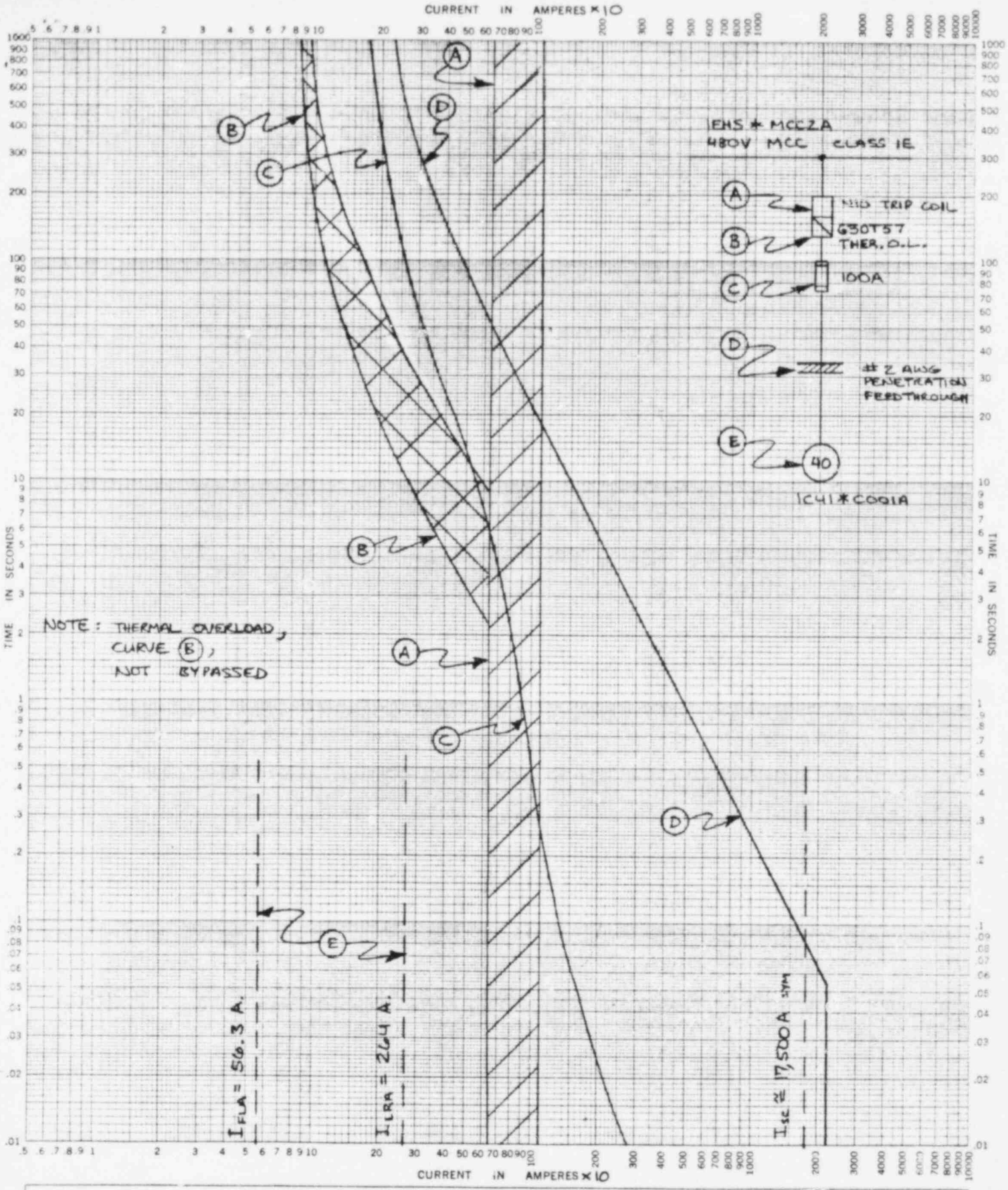
2. Curves are plotted to _____ Test points so variations should be _____

No. FIG. 8.3-13 b

Date _____

K-E TIME-CURRENT CHARACTERISTIC 48 5258
KEUFFEL & ESSER CO. MADE IN U.S.A.

#2 AWG PENETRATION
30 A FUSE
JID - TRIP COIL
LOAD - 1E12 * F009



For _____ 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 _____

No. FIG. 8.3-13 c

Date _____

K+E TIME-CURRENT CHARACTERISTIC 48 5258
KEUFFEL & ESSER CO. MADE IN U.S.A.

#2 AWG PENETRATION
100 AMP FUSE
N10 - TRIP COIL
T57 - TERM. O.L.
LOAD - 1C41 * C001A

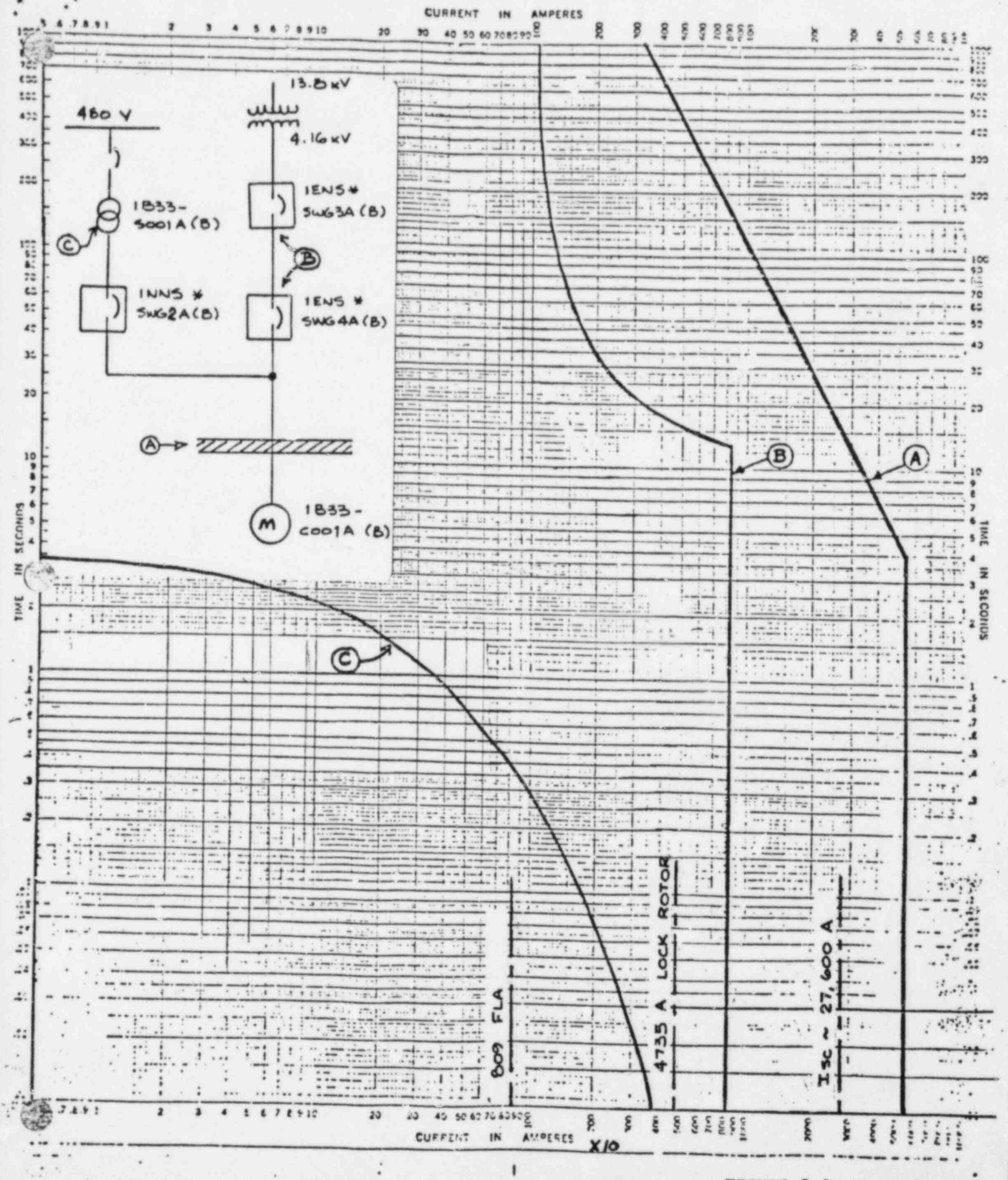
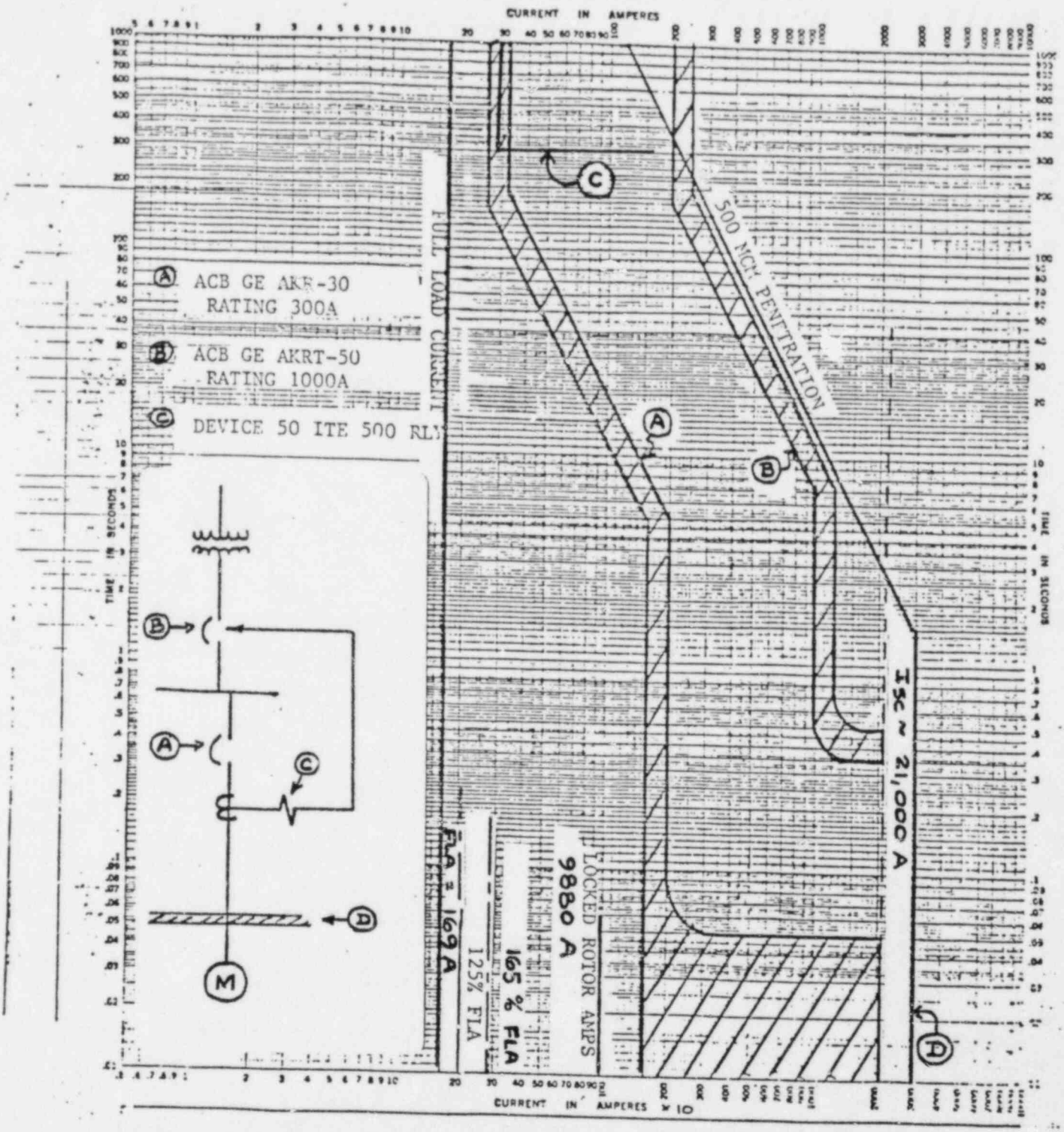


FIGURE 8.3- 13d
TYPICAL 1500 MCM
PENETRATION



TYPICAL FOR 1HVR * UC1A & 1B

FIGURE 8.3-13e
500 MCM PENETRATION