

PHILADELPHIA ELECTRIC COMPANY

NUCLEAR GROUP HEADQUARTERS

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January 31, 1991

Docket Nos. 50-352  
50-353

License Nos. NPF-39  
NPF-85

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

Subject: Limerick Generating Station, Units 1 and 2  
Technical Specifications Change Request

Gentlemen:

Philadelphia Electric Company is submitting Technical Specifications Change Request No. 87-05-0, in accordance with 10 CFR 50.90, requesting an amendment to the Technical Specifications (TS) (Appendix A) of Operating Licenses NPF-39 and NPF-85 for Limerick Generating Station (LGS), Units 1 and 2 respectively. Information supporting this Change Request is contained in Attachment 1 to this letter, and the proposed replacement pages for the LGS, Units 1 and 2, TS are contained in Attachment 2.

This submittal requests a change to TS Section 3/4.8.4, "Electrical Equipment Protective Devices," Surveillance Requirement (SR) 4.8.4.1 to expand the testing tolerance of the 480 volt molded case circuit breakers.

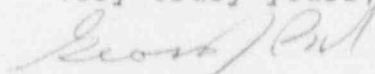
We are requesting that, if approved, the NRC issue the Amendments to the LGS, Units 1 and 2, TS in time for use during an upcoming Unit 2 refueling outage currently scheduled to begin on March 23, 1991. Therefore, we request that the approved Amendments be effective upon issuance.

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PDR

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If you have questions regarding this matter, please contact us.

Very truly yours,



G. J. Beck  
Manager  
Licensing Section  
Nuclear Engineering and Services

Attachments

cc: T. T. Martin, Administrator, Region I, USNRC (w/ attachments)  
T. J. Kenny, USNRC Senior Resident Inspector, LGS (w/ attachments)  
T. M. Gerusky, Director, PA Bureau of Radiological Protection  
(w/ attachments)

bcc: D. M. Smith - 52C-7 (w/o attachments)  
D. R. Helwig - 63C-1 "  
G. M. Leitch - LGS, 200 "  
J. B. Cotton - 53A-1 "  
W. J. Boyer - 63A-1 "  
R. N. Charles - 51A-1 "  
J. Doering - LGS, A5-1 "  
G. J. Beck - 52A-5 "  
J. A. Muntz - LGS, 336 "  
G. J. Madsen - LGS, SB3-4 (w/ attachments)  
R. M. Krich/RWG - 52A-5 "  
PA BRP Inspector - LGS, 334 "  
Commitment Coordinator - 52A-5 "  
Correspondence Control Deck "  
DAC "

COMMONWEALTH OF PENNSYLVANIA :

: SS.

COUNTY OF CHESTER :

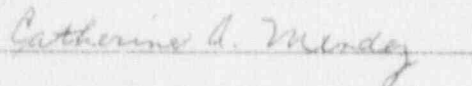
G. M. Leitch, being first duly sworn, deposes and says:

That he is Vice President of Philadelphia Electric Company; the Applicant herein; that he has read the foregoing Application for Amendment of Facility Operating License Nos. NPF-39 and NPF-85 (Technical Specifications Change Request No. 87-05-0) to expand the testing tolerance for the 480 volt instantaneous magnetic molded case circuit breakers, and knows that the contents thereof; and that the statements and matters set forth therein are true and correct to the best of his knowledge, information and belief.



Vice President

Subscribed and sworn to  
before me this 31<sup>st</sup> day  
of *January* 1991.



Notary Public

NOTARIAL SEAL  
CATHERINE A. MENDEZ, Notary Public  
Tredyffrin Twp., Chester County  
My Commission Expires Sept. 4, 1993

ATTACHMENT 1

LIMERICK GENERATING STATION, UNITS 1 AND 2

Docket Nos. 50-352  
50-353

License Nos. NPF-39  
NPF-85

TECHNICAL SPECIFICATIONS CHANGE REQUEST

No. 87-05-0

"Expanded Test Tolerance for 480 Volt Molded Case  
Circuit Breakers"

Supporting Information for Changes - 7 pages

Philadelphia Electric Company (PECo), Licensee under Facility Operating Licenses NPF-39 and NPF-85 for Limerick Generating Station (LGS), Units 1 and 2 respectively, requests that the Technical Specifications (TS) contained in Appendix A of the above mentioned Operating Licenses be amended as proposed herein to expand the testing tolerance for the 480 volt molded case circuit breakers. This proposed change requests that the testing tolerance for the 480 volt instantaneous magnetic molded case circuit breakers, as specified in TS Surveillance Requirement (SR) 4.8.4.1, be expanded from  $\pm 20\%$  of the current trip setpoint value of the instantaneous element to  $-20\%/+40\%$ . The proposed TS change is indicated by a vertical bar in the margin of the pages contained in Attachment 2.

We are requesting that, if approved, the NRC issue the Amendments to the LGS, Units 1 and 2, TS in time for use during an upcoming Unit 2 refueling outage currently scheduled to begin on March 23, 1991. Therefore, we request that the approved Amendments be effective upon issuance.

This Change Request provides a discussion and description of the proposed TS change, a safety assessment of the proposed TS change, information supporting a finding of No Significant Hazards Consideration, and information supporting an Environmental Assessment.

#### Discussion and Description of the Proposed Change

The 480 volt instantaneous magnetic (IM) molded case circuit breakers function to prevent thermal degradation of Primary Containment electrical penetrations by providing overcurrent protection for Class 1E and Non-Class 1E circuits passing through the Primary Containment barrier. These devices protect electrical penetration assembly conductors and seals from overheating in event of overcurrent conditions. The Primary Containment electrical penetrations at LGS are designed in accordance with the guidance provided in Regulatory Guide (RG) 1.63, "Electrical Penetration Assemblies in Containment Structures for Water Cooled Nuclear Power Plants," Revision 0, dated October 1973. This RG stipulates that electrical penetration assemblies should be designed to withstand, without loss of mechanical integrity, the maximum fault current versus time conditions that could occur as a result of a single random failure of circuit overload devices.

The 480 volt IM molded case circuit breakers are the primary devices for protecting electrical penetration assemblies from overcurrent conditions. The IM circuit breaker provides short circuit protection only and is designed to instantaneously open when the current through the circuit is equivalent or greater than the current limit setpoint of the breaker. A back-up thermal-magnetic circuit breaker is connected in series with the primary IM breaker for additional penetration protection. The back-up thermal-magnetic breaker provides both thermal and overcurrent protection and is designed to open if current through the penetration conductors is sustained for a sufficient period of time to

cause the back-up breaker to trip on thermal overload, or to instantaneously trip on overcurrent if the primary IM breaker fails to function. In addition, a thermal overload heater block is located downstream of the primary and back-up circuit breakers for additional penetration thermal overload protection. These devices contain contacts which open when current passing through the device is sustained for a sufficient period of time to reach the temperature setpoint of the block.

TS Section 3/4.8.4, "Electrical Equipment Protective Devices," SR 4.8.4.1 requires that each Primary Containment penetration conductor overcurrent protective device shown in TS Table 3.8.4.1-1, "Primary Containment Penetration Conductor Overcurrent Protective Devices," shall be demonstrated operable. Specifically, TS SR 4.8.4.1a.2 requires that the instantaneous element shall be tested by injecting a current equal to  $\pm 20\%$  of the pickup value of the element and verifying that the circuit breaker trips instantaneously with no intentional time delay. The TS magnetic trip setting tolerance of  $\pm 20\%$  was developed under closely specified and controlled conditions during factory calibration. Using this tolerance, the allowable trip range is too narrow for field verification testing of the breakers because the IM breaker trip characteristics can be greatly influenced by stray magnetic fields induced by steel enclosures, test equipment, or the conductors to the breakers. Since extraneous factors are more prevalent in the field, where test conditions are not easily controlled, a higher than expected number of IM circuit breakers fail to trip within the allowable upper range currently specified in TS (i.e., setpoint plus 20% tolerance).

The National Electrical Manufacturers Association (NEMA) Standard AB 2-1984, "Procedures for Field Inspection and Performance Verification of Molded Case Circuit Breakers Used in Commercial and Industrial Applications," Section 5, "Instantaneous Overcurrent Trip Test," recommends the use of an upper range tolerance of + 40% above the design setpoint to allow for differences between factory and field testing setup and conditions.

Therefore, we are requesting that the  $\pm 20\%$  testing tolerance for the 480 volt IM molded case circuit breaker currently specified in TS be expanded to permit the use of a -20%/+40% testing tolerance. The proposed testing tolerance will be used in the same fashion as the present TS tolerance for evaluating primary containment conductor overcurrent protective device operability. Expanding the tolerance for testing the IM circuit breaker does not affect the safety-related function of these breakers, since the expanded tolerances are used for verification testing only and do not change any design setpoints.

#### Safety Assessment

The proposed TS change will expand the testing tolerance for 480 volt IM molded case circuit breakers from  $\pm 20\%$  to -20%/+40% of the breaker trip setpoint. The present TS testing tolerance of  $\pm 20\%$  is too narrow for field testing the circuit breakers, since the instantaneous

trip characteristics of the IM circuit breaker are greatly influenced by stray magnetic fields induced by steel enclosures, test equipment, or conductors to the circuit breakers. NEMA Standard AB 2-1984, Section 5, recommends the use of an upper range tolerance of +40% for testing the 480 volt IM circuit breaker element to allow for differences between factory and field testing conditions. Expanding the upper range tolerance from +20% to +40% will compensate for the differences experienced during field testing of the breakers; specifically, interference due to stray magnetic fields induced by other electrical equipment. The expanded tolerance of -20%/+40% will only be used for field testing of the IM element of the circuit breaker. Expanding the tolerance, as recommended in NEMA Standard AB 2-1984, does not affect the performance of the breakers or operation of equipment serviced by these breakers. The safety-related function of the circuit breakers will not be affected by expanding the testing tolerances, and the breakers will continue to provide the required protection for primary containment electrical penetrations and associated electrical equipment since the design circuit breaker setpoint will be unchanged.

The expanded tolerance of -20%/+40% will be used in the same fashion as the current TS testing tolerances (i.e.,  $\pm 20\%$ ) for determining the circuit breaker operability. The maximum permissible IM trip setting (i.e., the breaker setpoint plus the maximum tolerance allowed by the TS) was plotted on a time-current curve for each penetration conductor to verify the degree of protection for each penetration conductor and coordination with all upstream protective devices assuming a maximum tolerance +40% penetration assembly. Figure 1 (attached) is an example of a time-current curve for a penetration conductor that was evaluated with an IM circuit breaker in the circuit with a setpoint of 165 amperes. This figure shows that the circuit breaker should trip between 132 and 198 amperes with a testing tolerance of  $\pm 20\%$ , and should trip between 132 and 231 amperes with a testing tolerance of -20%/+40%. In all cases, the time-current curves for the IM circuit breakers indicate that the breakers will trip before the thermal limit of the associated penetration conductor is reached. In addition, calculations were performed using the expanded tolerance of -20%/+40% for each effected penetration assembly to determine if there was any reduction in the protection afforded by the circuit breakers. These calculations concluded that there is not a significant reduction in the level of protection, and that these circuit breakers will trip before the thermal limit of the associated penetration conductor is reached; thereby, providing the required thermal protection for the Primary Containment electrical penetration assemblies.

Therefore, expanding the testing tolerance from  $\pm 20\%$  to -20%/+40% will not adversely affect the safety-related function of the 480 volt IM circuit breakers since these devices will continue to provide the necessary thermal protection for penetration conductors and Primary Containment electrical penetration electrical assemblies.

Information Supporting a Finding of No Significant Hazards Consideration

We have concluded that the proposed change to the LGS, Units 1 and 2 TS, to expand the testing tolerance for the 480 volt molded case IM circuit breakers from  $\pm 20\%$  to  $-20\%/+40\%$ , does not constitute a Significant Hazards Consideration. This proposed change will accommodate for differences experienced between factory and in-plant testing of 480 volt IM molded case circuit breakers. In support of this determination, an evaluation of each of the three (3) standards set forth in 10 CFR 50.92 is provided below.

- 1) The proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

The current TS testing tolerance of  $\pm 20\%$  is too narrow for field verification testing because these breakers can be greatly influenced by stray magnetic fields induced by surrounding equipment. In order to perform IM molded case circuit breaker field verification tests, NEMA recommends the use of an expanded upper range tolerance of  $+40\%$  to allow for differences between factory and field testing setups and conditions.

The proposed expanded testing tolerance of  $-20\%/+40\%$  will be used for field verification purposes and will not affect the performance or operation of any safety-related equipment. The proposed tolerance is to be used in the same fashion as the present TS testing tolerance ( $\pm 20\%$ ) for determining circuit breaker operability. The design trip setpoints for these circuit breakers will not be changed.

The proposed maximum IM trip setting (i.e., the breaker setpoint plus the maximum tolerance allowed by the proposed TS change, assumed  $+40\%$ ) was plotted on a time-current curve for each Primary Containment electrical penetration conductor to verify protection for each conductor and coordination with all upstream protective devices. In all cases, the circuit breakers were verified to trip before the thermal limit of the associated penetration conductor is reached. Therefore, the safety-related function of the 480 volt IM molded case circuit breakers is not affected by the expanded testing tolerance since these breakers will continue to provide the required overcurrent and thermal protection for penetration conductors and Primary Containment electrical penetration seals. The LGS Updated Final Safety Analysis Report (UFSAR), Sections 8.1.6.1.12 and 8.1.6.1.14, were reviewed in making this determination. Therefore, since the circuit breakers will continue to perform as analyzed in the UFSAR, neither the probability nor the consequences of an accident previously evaluated will be increased.



In addition, the protection provided by the IM circuit breakers was not used in evaluating system fire protection standards. Therefore, changing the testing tolerances for the 480 volt IM molded case circuit breakers will not increase the probability or consequences of a fire.

- 2) The proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

The 480 volt IM molded case circuit breakers will continue to perform their design function of maintaining Primary Containment integrity. The safety-related function of the circuit breakers will not be affected by the proposed expanded testing tolerance of  $-20\%/+40\%$  since the circuit breakers will continue to provide the required penetration protection and coordination with all upstream protective devices and downstream connected motor current inrush.

Since the circuit breakers will continue to function as analyzed in the UFSAR, changing the tolerances for in-plant testing will not create the possibility of a new or different kind of accident previously evaluated.

- 3) The proposed change does not involve a significant reduction in a margin of safety.

The use of the proposed expanded testing tolerance of  $-20\%/+40\%$  will not affect the safety-related function of the 480 volt IM molded case circuit breakers since they will still perform their design function of protecting penetration conductors from overcurrent conditions and Primary Containment electrical penetration seals from thermal degradation. Penetration conductor protection and coordination with all upstream protective devices and downstream connected motor current inrush were evaluated and found to be acceptable.

Calculations were performed for each penetration conductor and concluded that for overcurrents at the maximum IM trip setting (i.e., the breaker setpoint plus the maximum tolerance allowed by the proposed TS,  $+40\%$ ), the circuit breakers will trip before the thermal limit of the associated penetration conductor is reached; thereby, providing the required thermal protection for the Primary Containment electrical penetration seals. These calculations did reflect a small reduction in the protection afforded by the circuit breakers; however, since the use of the proposed expanded range is used for field verification testing purposes only and does not involve a change to the breaker trip setpoint, the 480 volt IM molded case circuit breakers in conjunction with other protective devices (e.g., back-up thermal-magnetic circuit breaker, thermal overload heater block) will continue to prevent thermal degradation of Primary Containment electrical penetration seals.

Therefore, based on this determination, the proposed change to expand the 480 volt IM molded case circuit breaker testing tolerance from  $\pm 20\%$  to  $-20\%/+40\%$  of the pick up value the the breaker, does not involve a reduction in the margin of safety.

#### Information Supporting an Environmental Assessment

An environmental assessment is not required for the change proposed by this Change Request because the requested change to the LGS, Units 1 and 2, TS conforms to the criteria for "actions eligible for categorical exclusion" as specified in 10 CFR 51.22(c)(9). The requested change to the LGS, Units 1 and 2, TS will have no impact on the environment. The proposed change does not involve a significant hazards consideration as discussed in the preceding section. The proposed change does not involve a significant change in the types or significant increase in the amounts of any effluents that may be released offsite. In addition, the proposed change to the LGS, Units 1 and 2, TS does not involve a significant increase in individual or cumulative occupational radiation exposure.

#### Conclusion

The Plant Operations Review Committee and the Nuclear Review Board have reviewed this proposed change to the LGS, Units 1 and 2, TS and have concluded that it does not involve an unreviewed safety question, or a significant hazards consideration, and will not endanger the health and safety of the public.

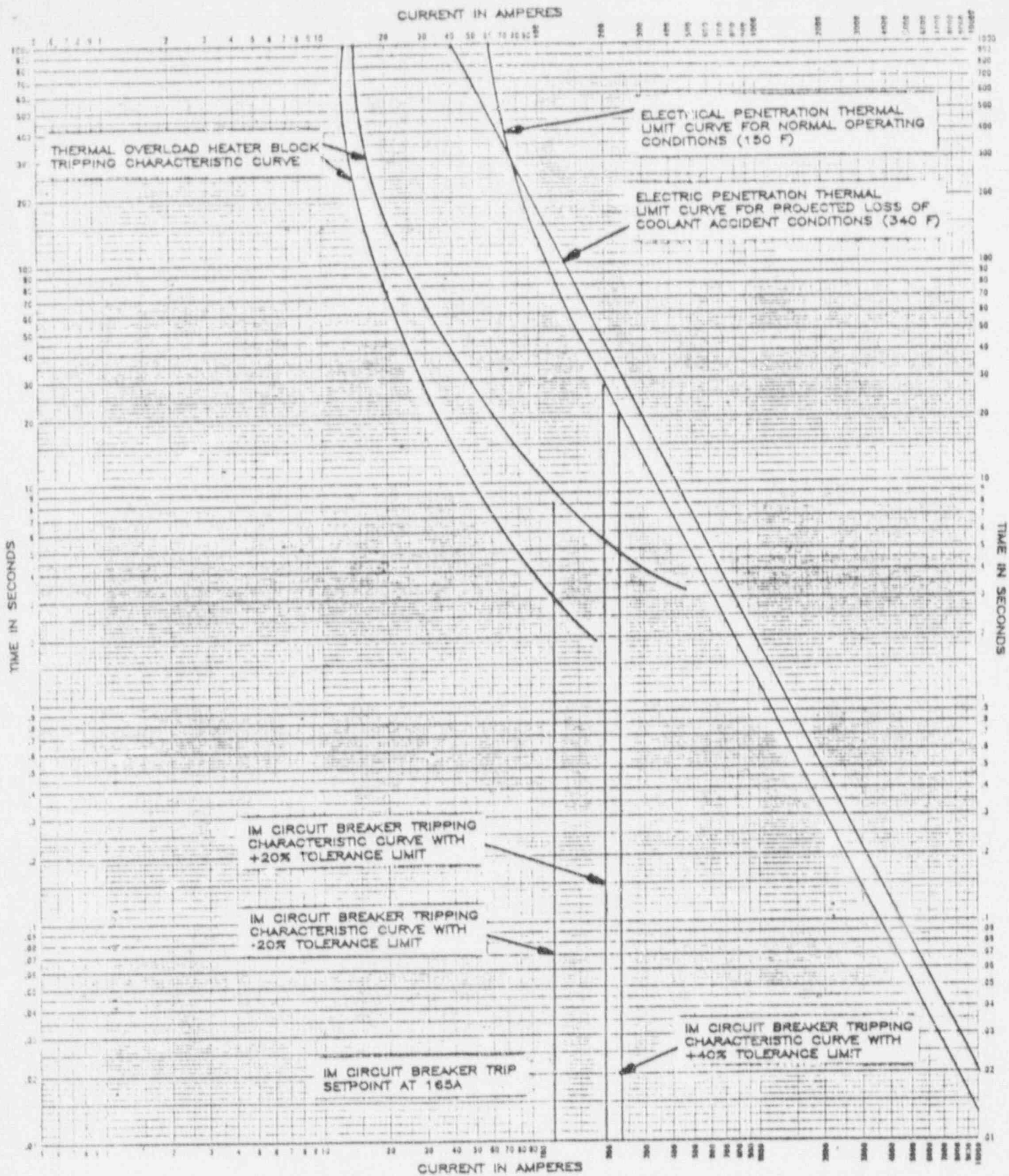


FIGURE 1  
 CHARACTERISTIC TRIPPING CURVES FOR  
 SELECTED #8 PENETRATION CONDUCTOR'S  
 THERMAL PROTECTIVE DEVICES