

SECTION 26 05 73
OVERCURRENT PROTECTIVE DEVICE STUDY

PART 1 - GENERAL**1.1 DESCRIPTION**

- A. This section specifies the overcurrent protective device arc-flash and short-circuit study, indicated as the study in this section.
- B. A short-circuit and arc-flash study shall be prepared for the electrical overcurrent devices to be installed under this project.
- C. The study shall present an analysis of each overcurrent protective device from the branch circuit panelboards up to the utility source and the on-site generator sources.
- D. All information necessary to complete the study shall be obtained by the contractor. The Government will provide the most recent study that was performed if one is available to be used for as a reference. It is the contractor's responsibility to obtain necessary nameplate and trip setting information from existing distribution equipment and the available fault current from the utility company.
- E. Install adhesive arc flash warning labels on all equipment as required by NFPA 70E per the results of this study. Label shall indicate the arc hazard boundary (inches), working distance (inches), arc flash incident energy at the working distance (calories/cm²), required PPE category and description including the glove rating, voltage rating of the equipment, limited approach distance (inches), restricted approach distance (inches), prohibited approach distance (inches), equipment/bus name, date prepared, and manufacturer name and address.

1.2 RELATED WORK

- A. Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS: General electrical requirements that are common to more than one section of Division 26.
- B. Section 26 22 00, Low-Voltage Transformers.
- C. Section 26 24 16, PANELBOARDS: Low-voltage panelboards.

1.3 QUALITY ASSURANCE

- A. Refer to Paragraph, QUALIFICATIONS (PRODUCTS AND SERVICES), in Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.
- B. The study shall be prepared by the equipment manufacturer.

1.4 SUBMITTALS

A. Submit six copies of the following in accordance with Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.

1. Product data on the software program to be used for the study.

Software shall be in mainstream use in the industry, shall provide device settings and ratings, and shall show selective coordination by time-current drawings.

2. Complete study as described in paragraph 1.6. Submittal of the study shall be well-coordinated with submittals of the shop drawings for equipment in related specification sections.

3. Certifications: Two weeks prior to final inspection, submit the following.

a. Certification by the Contractor that the overcurrent protective devices have been set in accordance with the approved study.

1.5 APPLICABLE PUBLICATIONS

A. Publications listed below (including amendments, addenda, revisions, supplements, and errata) form a part of this specification to the extent referenced. Publications are referenced in the text by designation only.

B. Institute of Electrical and Electronics Engineers (IEEE):

242-01.....Protection and Coordination of Industrial and
Commercial Power Systems

399-97.....Industrial and Commercial Power Systems
Analysis

1584a-04.....Guide for Performing Arc-Flash Hazard
Calculations

1.6 STUDY REQUIREMENTS

A. The study shall include one line diagram, short-circuit and ground fault analysis, and arc-flash hazard analysis for all overcurrent protective devices.

B. One Line Diagram:

1. Show all electrical equipment and wiring to be protected by the overcurrent devices.

2. Show the following specific information:

a. Calculated fault impedance, X/R ratios, and short-circuit values at each feeder and branch circuit bus.

b. Relay, circuit breaker, and fuse ratings.

- c. Generator kW/kVA and transformer kVA and voltage ratings, percent impedance, X/R ratios, and wiring connections.
- d. Voltage at each bus.
- e. Identification of each bus, matching the identification on the drawings.
- f. Conduit, conductor, and busway material, size, length, and X/R ratios.

C. Short-Circuit Study:

- 1. The study shall be performed using computer software designed for this purpose. Pertinent data and the rationale employed in developing the calculations shall be described in the introductory remarks of the study.
- 2. Calculate the fault impedance to determine the available short-circuit and ground fault currents at each bus. Incorporate applicable motor and/or generator contribution in determining the momentary and interrupting ratings of the overcurrent protective devices.
- 3. Present the results of the short-circuit study in a table. Include the following:
 - a. Device identification.
 - b. Operating voltage.
 - c. Overcurrent protective device type and rating.
 - d. Calculated short-circuit current.

1.7 ANALYSIS

- A. Analyze the short-circuit calculations, and highlight any equipment determined to be underrated as specified. Propose solutions to effectively protect the underrated equipment.

1.8 ADJUSTMENTS, SETTINGS, AND MODIFICATIONS

- A. Final field settings and minor modifications of the overcurrent protective devices shall be made to conform with the study, without additional cost to the Government.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

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