SECTION 26 05 73 - ELECTRICAL POWER SYSTEM STUDIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION

A. The electrical equipment manufacturer shall provide electrical power system studies for the project as specified herein.

1.3 SUBMITTAL AND RECORD DOCUMENTATION

A. Submit five copies of the completed power system studies, bound and tabulated with table of contents and section & page numbers.

PART 2 - PRODUCTS

2.1 SHORT-CIRCUIT ANALYSIS

A. Calculation of the maximum rms symmetrical three-phase short-circuit current at each significant location in the electrical system shall be made using a digital computer and software.

B. Appropriate motor short-circuit contribution shall be included at the appropriate locations in the system so that the computer-calculated values represent the highest short-circuit current the equipment will be subjected to under fault conditions.

C. A tabular computer printout shall be included which lists the calculated short-circuit currents, X/R ratios, equipment short-circuit interrupting or withstand current ratings, and notes regarding the adequacy or inadequacy of the equipment.

D. The study shall include a computer printout of input circuit data including conductor lengths, number of conductors per phase, conductor impedance values, insulation types, transformer impedances and X/R ratios, motor contributions, and other circuit information as related to the short-circuit calculations.

E. Include a computer printout identifying the maximum available short-circuit current in rms symmetrical amperes and the X/R ratio of the fault current for each bus/branch calculation.

F. The system one-line diagram shall be computer generated and shall clearly identify individual equipment buses, bus numbers/names used in the short-circuit analysis, cable and bus connections between equipment, calculated maximum short-circuit current at each bus location and other information pertinent to the computer analysis.

G. A comprehensive discussion section evaluating the adequacy or inadequacy of the equipment must be provided and include recommendations as appropriate for improvements to the system.

H. The analysis shall be based upon the actual available three-phase short-circuit rms symmetrical current from the serving utility's system. Include in the report this value on utility letterhead.

I. The contractor shall be responsible for supplying actual conductor information (lengths, types, number per phase, etc.) and other pertinent equipment information (transformer sizes and impedances, generator sizes and sub-transient reactances, etc.) to the equipment manufacturer in a timely manner to allow the short-circuit analysis to be completed, reviewed, and modified as necessary prior to ordering of equipment.

J. Any inadequacies shall be called to the attention of the Engineer and recommendations made for improvements as soon as they are identified.

2.2 EMERGENCY SYSTEM PROTECTIVE DEVICE TIME-CURRENT COORDINATION ANALYSIS

A. The time-current coordination analysis shall be performed on the emergency system with the aid of a digital computer and software and shall include the determination of settings, ratings, or types for the overcurrent protective devices supplied, to comply with NEC 700 and/or 701.

B. Where necessary, the Engineer shall be consulted regarding the appropriate compromises to be made between system protection and service continuity.

C. A sufficient number of computer-generated log-log plots shall be provided to indicate the degree of system protection and coordination by displaying the time-current characteristics of series-connected overcurrent devices and other pertinent system parameters.

D. Computer printouts shall accompany the log-log plots and shall contain descriptions for each of the devices shown, settings of the adjustable devices, the short-circuit current availability at the device location when known, and device identification numbers to aid in locating the devices on the log-log plots and the system one-line diagram.

E. The study shall include a separate, tabular computer printout containing the suggested device settings of all adjustable overcurrent protective devices, the equipment where the device is located, and the device number corresponding to the device on the system one-line diagram.

F. A computer-generated system one-line diagram shall be provided which clearly identifies individual equipment buses, bus numbers, device identification numbers and the maximum available short-circuit current at each bus when known.

G. A discussion section which evaluates the degree of system protection and service continuity with overcurrent devices, along with recommendations as required for increasing system protection or device coordination.

H. The contractor shall be responsible for supplying actual equipment and system information to the equipment manufacturer in a timely manner to allow the protective device time-current coordination analysis to be completed, reviewed, and modified as necessary prior to ordering of equipment.

I. Significant deficiencies in protection and/or coordination shall be called to the attention of the Engineer and recommendations made for improvements as soon as they are identified.

2.3 MANUFACTURERS/VENDORS

A. The specified electrical power system studies shall be performed by the manufacturer(s) of the electrical distribution equipment.

END OF SECTION