SECTION 16920

POWER MONITORING AND CONTROL SYSTEM

PART 1 GENERAL

1.1 SUMMARY

A. This section describes requirements for the Power Monitoring and Control System at ANC. The system is being installed in the South Terminal as part of the Concourse C, Phase 2 Building Completion Project. Power monitoring devices shall be provided as noted below for distribution equipment installed at ANC (North and South Terminal).

1.2 GENERAL DESCRIPTION

A. Work under this section includes providing Power Monitoring and Control System equipment to provide the following functionality:

1. Monitoring of the electrical system status, including alarm conditions.
2. Gathering and storage of load information for general administration of the electrical system.
3. Detailed analysis and trouble-shooting of the electrical system, including harmonics analysis, waveform capture and analysis, etc.
4. Energy and demand metering of multiple tenants for revenue purposes.

B. Two existing Personal Computer Workstations provide for storage of collected data, system operation and running the analytical software.

C. System information shall be transmitted to and integrated into the Building Automation System Controls Supervisory System. ANC will provide all interfacing required (cabling, device communication interface hardware and programming).

1.3 SYSTEM DESCRIPTION

A. Furnish and install Power Monitoring and Control System (PMCS) equipment as described in these specifications. The existing system includes remote devices for monitoring, control and protection, device communication interface hardware, inter-communication wiring, personal computer workstations, software, interfacing, printer, and ancillary equipment.

B. The existing PMCS is a Square D Powerlogic system. All new equipment shall be Square D Powerlogic to match existing.

C. The existing PMCS utilizes Ethernet as the high-speed backbone network.

D. Each Personal Computer Workstation (PCW) connected to the network has equal access to information provided by the power monitoring devices for centralizing data display, data logging, alarming, event recording, and other power monitoring operations.

E. The high-speed network allows direct access to data provided by the power monitoring devices for implementing automatic control.

F. ANC will provide connections to the Building Automation Control System (BAS) LonWorks network, including Graphical monitoring and alarm reporting to the Building Automation Control System (BAS) Supervisory System. ANC will provide all programming and graphics generation.

1.4 QUALITY

A. PMCS components included within power equipment lineups shall be factory installed, wired and tested prior to shipment to the job site.

1.5 SHOP DRAWINGS

A. Provide detailed Shop Drawings suitable for installation and ongoing operation and maintenance of PMCS System components provided by the Tenant.

1. Indicate electrical characteristics and connection requirements.

2. When PMCS components are installed by the power equipment manufacturer, the power equipment shop drawings shall clearly identify the components, the internal connections, and all external connections.

3. The PMCS drawings shall show all PMCS components including necessary component dimensions; type, size, and weight; location of conduit entry and exit; single line diagram indicating external wiring requirements.

4. Drawings shall identify terminal blocks used for interconnections and wire type to be used.

1.6 MONITORING DEVICES

A. Energy Meters: Energy meters shall be provided to monitor the following feeders:

1. Feeder breakers in Main Distribution Switchboards. Exception: when feeder breaker feeds a 480V:208Y/120V step down transformer the energy meter shall be located in the panel downstream of the transformer.

2. Feeder breakers in Distribution panels that feed the following (Exception: when feeder breaker feeds a 480V:208Y/120V step down transformer the energy meter shall be located in the panel downstream of the transformer.)

a. Downstream Distribution panels.

b. Tenant Panels.

B. Circuit Monitors: Electronic circuit monitors shall be provided in new main distribution switchboards to monitor the main circuit breaker(s).

PART 2 - PRODUCTS

2.1 ENERGY METERS

A. The Enercept Meter shall consist of three split-core CTs hinged at both axes with the power metering electronics embedded inside of the master CT.

B. The Enercept Meter shall directly accept any voltage input from 208-480 VAC.

C. The Enercept Meter series shall have models available for amperage ranges of 100-2400 Amps.

D. ANC will provide network connections to Enercept Meters.

2.2 CIRCUIT MONITORS – SERIES 4000

A. Electronic circuit monitors shall provide true RMS metered values. Information provided by each circuit monitor shall include frequency, temperature, current, demand current, voltage, real power, reactive power, apparent power, demand power, predicted demand power, power

factor, accumulated energy, accumulated reactive energy, total harmonic distortion (THD) of each current and voltage, and K-factor of each current. Circuit Monitors shall be the Square D CM4000.

B. The Circuit Monitors shall accept metering inputs of up to 600Vac; direct connection or from industry standard instrument transformers (120 VAC secondary PTs and 5 A secondary CTs). Connection to 480Y/277 VAC circuits shall be possible without use of PTs. Provide Square D CMV.

1. PT primaries through 1.2 MV shall be supported

2. CT primaries through 32 kA shall be supported

C. On four-wire systems a fourth CT input shall be provided to measure neutral current. In four-wire connections the Circuit Monitor shall utilize the circuit neutral common reference and not earth ground, to provide metering accuracy.

D. Display type shall match existing circuit monitors provided in Concourse C Phase 2 Building Completion Project.

E. ANC will provide network connections to Circuit Monitors.

F. Circuit Monitor Input/Output Module: Provide circuit monitors with one solid state output suitable for KYZ pulse initiation; four solid state status inputs; three (10A) mechanical output relays

2.3 MOLDED CASE CIRCUIT BREAKER ELECTRONIC TRIP UNITS

A. Electronic Trip Units shall be provided as noted in Section 16475 – Overcurrent Protective Devices.

B. Electronic Trip units shall be monitored by the PMCS network. ANC will provide network connections to Electronic Trip Units.

2.4 PMCS NETWORK

A. ANC will provide network connections of Power Monitoring Devices.

B. Interface to Other Systems: ANC will interface the high-speed network utilized by the PMCS system with the Building Automation System (BAS).

2.5 EXISTING PERSONAL COMPUTER WORKSTATIONS (PCWS)

A. The PMCS includes two Personal Computer Workstations. ANC will integrate Tenant devices into the PCWS.

2.6 PMCS APPLICATION SOFTWARE

A. The PMCS monitors the devices in the system, recording events, indicating alarm conditions, and displaying and logging device data. ANC will integrate Tenant devices into the PCWS.

PART 3 EXECUTION

3.1 INSTALLATION

A. PMCS components, including Circuit Monitors and Electronic Trip Units, included within the power equipment lineups shall be factory installed, wired and tested prior to shipment to the project site.

B. All control power, CT, PT and data communications wire shall be factory wired and harnessed within the equipment enclosure.

C. Where external circuit connections are required, terminal blocks shall be provided and the manufacturer's drawings shall clearly identify the interconnection requirements including wire type to be used.

D. ANC will provide all wiring required to externally connect equipment lineups.

3.2 BAS INTERFACE AND GRAPHICS

A. ANC will provide physical and software interfacing for connection and uploading of system information to the BAS network.

B. All system alarm and status information will be presented in graphical form on the BAS Controls Supervisory System Operator Workstations.

END OF SECTION