SECTION 26 08 00
ELECTRICAL GENERAL COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general requirements that apply to implementation of the required commissioning process without regard to specific systems, assemblies, or components. This scope of work expands upon and is in addition to the scope of work and testing required and indicated on the contract drawings and individual specification sections.

B. Follow commissioning procedures and provide support throughout standard level 2, 3, 4 and 5 commissioning procedures as outlined in the contract documents.

C. Coordinate and provide appropriate technicians and manufacturer's representatives, including pre-purchased equipment, as required to meet the schedule and contract requirements.

D. Receive, inventory and check against shop drawings and contract drawings all material and equipment received on site including Owner pre-purchased equipment.

E. Complete required paperwork for each commissioning level in a timely manner and provide copies to the General Contractor and Commissioning Authority (CxA). Compliance and completeness of paper work will be reviewed regularly and a condition for approval of monthly requisitions.

F. Systems to be commissioned and performance benchmarked include all systems related to the data center including but not limited to:

1. Switchgear and switchboards.
2. Automatic transfer switches.
3. Automatic transfer control systems and all possible sequences of operation.
4. Distribution system.
5. Cabling systems.
6. Transformers.
7. Power distribution systems (PDU).
8. Emergency Power Off (EPO) systems.
9. Generators and associated control, fuel and alarm systems.
10. Uninterruptible Power Supply (UPS) systems.
11. Meters.
12. Fire Alarm System
13. Security System
14. BMS/MAS Control and Monitoring Systems.

G. Provide personnel, cooperate and assist with all testing and commissioning of project systems.

H. Provide certified qualified personnel to perform start up of equipment and systems and for testing required or specified.

I. Provide personnel to support full time, the level 5 testing schedule indicated in Section 019100. Personnel shall include the project foreman and additional personnel as required to operate equipment and support commissioning and integrated testing and the proposed schedule.

1.2 RELATED WORK

A. Section 26 00 10 – Basic Electrical Requirements is an integral part of this Section. Requirements and work indicated in Section 26 00 10 are not repeated in this Section.

B. Section 01 91 00 – General Data Center Commissioning Requirements, is an integral part of this section. Requirements and work indicated in 01 91 00 are not repeated in this Section.

C. Owner's Project Requirements (OPR) and Basis of Design (BOD) documentation are included by reference for information only.

1.3 DEFINITIONS

A. Refer to Section 01 91 00 – General Data Center Commissioning Requirements.

B. Levels of Commissioning

1. Level One – Factory Testing
2. Level Two – Component Verification
3. Level Three – System Installation Verification
4. Level Four – Individual System Operation Verification (Acceptance testing to verify all contract requirements have been completed and the systems operate as specified).
5. Level Five – Integrated System Testing –testing to verify and document system operation.

1.4 COMMISSIONING TEAM

A. Appoint Individual(s) to be part of the commissioning team, each having the authority to act on behalf of the entity he or she represents, and explicitly organized to implement the commissioning process through coordinated action with all of the project team.

B. These representatives shall review and comment where appropriate on all commissioning documents, attend all meetings and coordinate scopes of work with all team members.

1.5 OWNER'S RESPONSIBILITIES

A. Refer to Section 01 91 00 – General Data Center Commissioning Requirements.

B. Load banks and cables will be furnished through the Owner's national contract.

1.6 THIS SECTION'S RESPONSIBILITIES

A. Assign representatives with expertise and authority to act on its behalf and shall schedule them to participate in and perform commissioning process activities including, but not limited to, the following:

1. Attend commissioning team meetings held on a weekly basis at the normal meetings and more frequently as level 4 and 5 commissioning get closer and daily during level 4 and 5 commissioning.
2. Integrate and coordinate commissioning process activities with the construction schedule.
3. Review and accept construction checklists provided by the Commissioning Agent (CxA).
4. Complete paper and electronic construction checklists as Work is completed and provide to the Design Team and the Commissioning Authority on a weekly basis.
5. Review, comment and accept commissioning process test procedures provided by the Commissioning Authority.
6. Complete commissioning process test procedures.
7. Assure compliance with the commissioning schedule by organizing and planning to have appropriate personnel, equipment and material available when required. Coordinate vendor's personnel for all furnished and assigned owner's pre-purchased equipment. Provide as much advanced notice to vendors as possible.
8. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
9. Cooperate with the CxA for resolution of issues recorded in the Issues Log.

1.7 COMMISSIONING AGENT'S (CxA'S) RESPONSIBILITIES

A. Refer to Section 01 91 00 – General Data Center Commissioning Requirements.

PART 2 - PRODUCTS

2.1 LOAD BANKS AND CABLING AS REQUIRED FOR LEVEL 4 AND 5 TESTING

A. For the generator testing provide resistive load banks rated for full load of the generator.

B. For UPS and battery testing provide resistive load banks for the full load rating of the UPS system.

C. For the chiller load system provide load banks for the full load rating of the chiller system using suitcase style load banks located in the computer room. Typical load bank rating is 100kW at 240V derated to 75kW at 208V.

D. For Integrated Systems Testing (level 5) provide suitcase style load banks, located in the computer room, for the full load rating of the UPS system plus three spare load banks.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Suitcase loadbanks – maximum rating of 64kW on a 225A circuit breaker. Do not exceed 80% of CB ampacity rating.

B. Evenly space out suitcase load banks in the computer room. The loadbanks shall line up with the edge of the access floor perforated tile, with fans blowing in the opposite direction (towards the hot aisle). Generally, load banks are located at every other row of perforated tiles, blowing towards each other but offset so they blow between each other. Preferably, loadbanks are set approximately 13 ft apart (up to 20 ft if room permits) along the perforated tiles. Do not locate closer than 10 feet from an air conditioner unit.

C. Install cables and pigtails with pin and sleeve connector for all load banks. Install load banks and connect cables. Pigtails with pin and sleeve connectors shall be hardwired to CBs to allow quick relocation of load banks during testing.

D. Provide connection points and UPS (using temporary panels) power for the load bank control power and fan circuits for the suitcase load banks.

E. Coordinate delivery, cable lengths, types and schedules for load banks and testing to maximize efficient common use of the load banks.

3.2 DOCUMENTATION

A. Document location of all load banks and direction of airflow on a floor plan that also indicates raised floor tiles, perforated tiles, air conditioning units PDUs and RPPs.

END OF SECTION