

5. SECTION B - SCOPE OF SERVICES:

5.1. Background

The Montgomery County Department of General Services, Division of Facilities Management, is seeking to enter into a contract with an experienced and qualified firm to provide Critical Power Systems Support Services. As it relates to this contract, Critical Power Systems encompass, Uninterruptible Power Systems, Battery Plants, Emergency Generators, Critical HVAC Systems, Automatic Transfer Switches, Telecommunication Rectifiers (-48 Volt & +24 Volt), Power Distribution Units, Static Transfer Switches, Transient Voltage Surge Suppressors, associated Switchgear and Environmental Monitoring systems and Hydrogen Gas detection system.

5.2. Intent

A contract resulting from this RFP shall provide for the performance of Preventive Maintenance on a scheduled basis and Corrective Maintenance, System Modifications, Site Acceptance Testing, Commissioning, Power Quality Monitoring and Troubleshooting, Site Surveys, Feasibility Studies, Infrared Scanning, and Engineering Furnish & Install (EF&I) Services on an as needed Time & Materials basis as quoted in the Additional Work section on the bid.

It shall also be the purpose of the contract to ensure that existing systems are maintained in accordance with Original Equipment Manufacturer (OEM) recommendations as well as to provide the necessary resources and expertise to provide complete Critical Power solutions for future requirements.

The work under this contract is divided into three general categories: (A) Semi-Annual Preventive Maintenance, Inspection, Testing and Repair; (B) Additional Work for major repairs, Special Testing, Modifications and for fulfillment of future Critical Power needs in all County Facilities, and (C) Emergency Services.

5.3. GROUP 1 – Department of General Services – DFM Scope of Services/Specifications/Work Statement

1.1 SEMI-ANNUAL INSPECTION AND TESTING

Except for Additional Work and Emergency Services, all other inspection and test procedures shall be performed Semi-Annually. The first group of inspections and tests shall commence within two (2) weeks of the date of the written notice by the Contract Administrator/Designee. Any battery(ies) or other finite life components scheduled for yearly replacement must be replaced on the first inspection and then as the applicable specification stipulates. Any battery replaced hereunder shall be with a new battery of comparable make, size and within the first two months of its shelf life. The next set of tests and all other tests shall start at the second (6) month (Semi-Annual) interval from the completion of the last set of Semi-Annual tests.

All required tools and test equipment needed to perform the Semi-Annual inspection PM and tests shall be provided by the Contractor at no additional charge under this Contract. Contractor shall obtain from the OEM drawings and schematics of the system (if not provided by the County). Any and all replacement of parts shall be with OEM parts and at cost with no mark-up, unless OEM parts are unavailable and substitution of same is approved by the Contract Administrator/Designee. All parts replaced must be with new parts with a full life.

Work hours for performance of the Semi-Annual Inspection, PM/Testing and other maintenance will routinely be between the hours of 8:00 AM to 6:00 PM, Monday through Friday, Weekends and Holidays excepted. Systems requiring maintenance at other times are so designated on the equipment list with an *.

Depending on the type of Power Equipment being serviced one or more of the following Preventive Maintenance Scopes of Work shall be performed:

- Exhibit I Uninterruptible Power System

- Exhibit II Sealed Cell Battery Plant
- Exhibit III Flooded Cell Battery Plant
- Exhibit IV Telecommunications DC Power System
- Exhibit V Power Line Conditioner
- Exhibit VI Emergency Generator & Automatic Transfer Switch
- Exhibit VII Static Transfer Switch
- Exhibit VIII Power Distribution Unit

Note: The above Scopes of Work may be mutually modified to address the needs of systems equipped with additional specialized features.

Within five (5) days of completion of every Semi-Annual test and inspection, the Contractor must submit to the Contract Administrator/Designee a detailed written report of the results of each test procedure above, including any recommendations for major repairs, broken down into tasks with individual Not-To-Exceed Labor and Materials for the repairs consolidated into a proposed Job Authorization Form (JAF). When in the opinion of the Contractor, a condition is found which could impede the effectiveness or efficiency of the Equipment, an immediate verbal report and a not-to-exceed estimate must be provided. If the work is authorized by the Contract Administrator/Designee, it must be performed and billed as described under "Additional Work", (see Section C, item 3.2). One (1) copy of this report will be kept as part of the Equipment log at every location serviced. The Contractor must provide the logbook for each location.

EXHIBIT I

SCOPE OF WORK - UPS - PM

Measure and Record the following:

- Rectifier Input voltages & currents.
- Inverter Output voltages & currents.
- Bypass Input voltages & currents.
- System Output (Critical Buss) voltages & currents.
- Rectifier Output voltages and currents.
- Delta voltages (difference between Bypass & Inverter Output).
- Bypass and Inverter frequency.
- Compare front panel meter readings with above measurements and verify 3% accuracy.
- Check alarm/status indicators and remote status panel, note any deficiencies.
- Inspect air filters and replace if necessary.
- Check all fans for free and quiet rotation.
- Perform operational inspection of Static Switch/Transfer circuitry.
- Vacuum and clean UPS interior and exterior.
- Inspect, test & clean all major sub-assemblies and replace defective or marginal components.
- Check all electrical terminations for proper tightness and signs of overheating.

- Perform mechanical inspection of all transformers, filter capacitors and wiring.
- Check unit Power Supplies, AC/DC protection settings, and voltage waveforms.
- Verify correct Inverter free-run frequency.
- Simulate Input power failure and verify proper unit operation (customer permission required)
- Provide one copy of recorded data, full detailed written report, including a recommendation for major repairs, if any and a completed proposed written Job Authorization Form (JAF), together with any warranty for work completed

EXHIBIT II

SCOPE OF WORK - SEALED CELL BATTERY PM

- Measure and record total battery plant Float Voltage.
- Measure and record the DC Float Voltage of each individual battery jar.
- Measure and record the AC Ripple Voltage of each individual battery jar.
- Measure and record battery plant DC charge current.
- Measure and record battery plant AC ripple current.
- Visually inspect each battery jar & cover for cracks or leaks.
- Visually inspect each terminal and related hardware for signs of corrosion.
- Inspect all battery interconnect cable for signs of chaffing and stress.
- Clean all jar covers, racks and cabinets.
- Check for proper ventilation and unusual odors.
- Record ambient room temperature.

Review the data recorded above and initiate immediate corrective action if necessary. Also provide the detailed written reports and a proposed written JAF for any immediate repairs, if any.

EXHIBIT III

SCOPE OF WORK - FLOODED CELL BATTERY PM

Semi-Annual - Items performed once every 6 months:

- Measure and record 100% of all cell/jar float voltages.
- Measure and record 10% of all cell/jar link resistances.
- Measure and record 10% of all cell/jar specific gravities.
- Measure and record 10% of all cell/jar temperatures.
- Measure and record Plant DC voltage and AC ripple current.
- Visually inspect 100% of all cells for:
 - Excessive sediment buildup.

- Plate shedding.
- Sulfation and/or contamination.
- Post seal integrity.
- Proper electrolyte level.
- Cracks and/or leaks.
- Flame arrestor integrity.
- Link integrity.

- Add distilled water to bring electrolyte to proper level.
- Clean all cells/jars, and battery racks.
- Analyze all recorded and observed data.
- Provide written report.
- Measure and record 100% of all cell / jar link resistances.
- Measure and record 100% of all cell / jar specific gravities.
- Measure and record 100% of all cell / jar temperatures.

Annual - Items performed once every 12 months:

- Measure and record 100% of all cell/jar float voltages.
- Measure and record 10% of all cell/jar link resistances.
- Measure and record 10% of all cell/jar specific gravities.
- Measure and record 10% of all cell/jar temperatures.
- Measure and record Plant DC voltage and AC ripple current.
- Visually inspect 100% of all cells for:
 - Excessive sediment buildup.
 - Plate shedding.
 - Sulfation and/or contamination.
 - Post seal integrity.
 - Proper electrolyte level.
 - Cracks and/or leaks.
 - Flame arrestor integrity.
 - Link integrity.
- Add distilled water to bring electrolyte to proper level.
- Clean all cells/jars, and battery racks.
- Analyze all recorded and observed data.
- Provide written report.
- Measure and record 100% of all cell / jar link resistances.
- Measure and record 100% of all cell / jar specific gravities.
- Measure and record 100% of all cell / jar temperatures.

- Re-torque all link connections to specifications.
- Re-torque all rack bolts to specifications.

Detailed written report, including any proposed corrective actions as reflected on a completed proposed JAF to be given to the Contract administrator/Designee.

EXHIBIT IV

SCOPE OF WORK – TELECOM RECTIFIER/CHARGER PM

Measure and record the following:

- Rectifier Input voltage & currents.
- Rectifier Output voltages & currents.
- Regulation and ripple data.
- Compare front panel meter readings with above measurements and verify 2% accuracy.
- Perform visual inspection of all transformers, filter capacitors and wiring.
- Check all electrical terminations for proper tightness and signs of overheating.
- Verify Equalize timer operation and voltage setting.
- Check protection and alarm settings.
- Verify current limit calibrations.
- Check Forced parallel / Load share circuit operation, adjust as necessary.
- Verify operation of Low Voltage Load Disconnect panel (Customer permission required).
- Inspect fuse panel and fuse blown indicators.
- Verify operation of control and alarm panel.
- Check remote alarm & status indicators and note any deficiencies.
- Provide one copy of recorded data.

EXHIBIT V

SCOPE OF WORK – POWER LINE CONDITIONER PM

Measure and Record the following:

- Input voltages & currents.
- Output voltages & currents.
- Check alarm / status indicator, note any deficiencies.
- Vacuum and clean interior and exterior.
- Inspect, test & clean all major sub-assemblies and replace defective or marginal components.

- Check all electrical terminations for proper tightness and signs of overheating.
- Perform mechanical inspection of all transformers, filter capacitors and wiring.
- Check unit power supplies
- Check line/loss overvoltage protection settings.
- Perform functional tap switching test using Tandy 102/200
- Provide one copy of recorded data.

EXHIBIT VI

SCOPE OF WORK –EMERGENCY GENERATOR/ATS PM ENGINE

- General Inspection
- Check all belts: adjust/replace
- Check all hoses: note – block heater hoses must be replaced annually. Due to the operating temperatures to which the block heaters are subjected, they are prone to failure without annual replacement. The cost to replace the block heater hoses will be considered additional billing.
- Inspect the cooling system, test the antifreeze for proper concentration and DCA level, change the filter if equipped.
- Inspect the block heater for proper operation.
- Check the lube oil level, change oil and filters on an annual basis, inspect air filter and replace as required.
- Inspect the fuel system, replace filter annually.
- Inspect the battery electrolyte level, load test the battery, clean and tighten the cables.
- Inspect the battery charger for proper operation.
- Inspect the exhaust system.
- Test run the engine, check the oil pressure and water temperature, test all engine safeties, and test the governor operation.
- Check all ignition components (gas units).
- Inspect operation.

GENERATOR:

- Inspect all generator components.
- Test run the system, adjust voltage and frequency.
- Test output breaker and safeguard breakers.

AUTOMATIC TRANSFER SWITCH:

- Visually inspect the automatic transfer switch.

- Transfer load to emergency.
- Check time delays and overall operation.
- Return system to automatic.

EXHIBIT VII

SCOPE OF WORK – STATIC TRANSFER SWITCH PM

Measure and record the following:

- Preferred, Alternate and Critical Buss voltages & currents.
- Delta voltages (difference between Source 1, Source 2 & Critical Buss Output).
- Frequency of Preferred, Alternate and Critical Buss.
- Compare front panel meter readings with above measurements and verify accuracy within Manufactures specifications.
- Document source supply critical load.
- Check alarm/status indicators, note any deficiencies.
- Transfer critical load to Alternate source.

Measure and record the following:

- Preferred, Alternate and Critical Buss voltages & currents.
- Delta voltages (difference between Preferred, Alternate and Critical Buss).
- Frequency of Preferred, Alternate, and Critical Buss.
- Operate Maintenance Bypass (if equipped).
- Ensure proper operation.
- Measure and record all power supplies.
- Record all software revisions and update if needed.
- Verify Preferred Source failure transfers to Alternate (Customer Permission required).
- Check all fans for free and quiet rotation.
- Visually inspect and clean interior and exterior of STS.

Provide one copy of recorded data.

EXHIBIT VIII

SCOPE OF WORK PDU PM

- Measure and record Input, Output and Neutral voltages and currents.
- De-energize equipment (Customer permission required).

- Verify function of Emergency Power Off circuits. (Customer permission required)
- Check all electrical terminations for proper tightness and signs of overheating.
- Inspect transformers, wire harness, and circuit breakers for signs of overheating.
- Thoroughly clean interior and exterior of equipment.
- Re-energize system.
- Check alarm set points if applicable.
- Check operation of metering controls and alarms.
- Check all fans for free and quiet rotation (if applicable).
- Provide one copy of recorded data.

1.2 ADDITIONAL WORK

Major repairs, (Including Battery Replacements) Special Testing, Modifications and orders for fulfillment of future Critical Power needs are all considered Additional Work. For repairs, finite life parts replacements (Batteries, Fans, DC Capacitors, etc.) replacements or modifications on existing equipment's the Contractor shall provide a not-to-exceed estimate using the Job Authorization Form (JAF). For all other additional work, the Contractor shall first submit a detailed written Proposal. If the Proposal is accepted the Contractor will then be required to submit a Job Authorization Form distilling the detailed Proposal down to a simple not-to-exceed Time & Materials estimate. Provide design and installation of hydrogen detection system with exhaust fans for UPS battery rooms. The hydrogen detection system must provide interface with monitoring system and be connected to BMS and fire alarm system.

In either of the above cases, final billing for the work will include only the labor and materials used. No travel expenses shall be billed for the work. Labor must be billed at the hourly rates provided by the Contractor in the JAF. Payment for the Additional Work will be approved when the Contract Administrator has established that the work accomplished is acceptable in light of the requirements set forth above. Inventory items must be supplied at no additional cost to the County.

If the "Not-To-Exceed" estimates are determined to be excessive in cost or completion dates, the County may perform the work using in-house resources.

On request from the County, the Contractor must provide hands-on instruction to County personnel in the operation, safety precautions and recommended supplementary inspections of the Equipment as well as any Manual which describes such equipment and instructions. The instruction will be requested by the Contract Administrator/Designee and be done in accordance with the procedures for "Additional Work".

Contractor shall maintain the current list in this RFP and if there is addition or deletion during the period of contractor is responsible to update the list with those changes and provide the UPS list quarterly to the Contractor Administrator/Designee.

Contractor shall provide on its Work Order Form accurate location for each UPS system in the facilities and related information pertaining to the UPS systems locations.

1.3 EMERGENCY SERVICE

The Contractor must respond to requests for Emergency Service as defined herein. The County reserves the right to specify what constitutes the emergency situation. Emergency services will comply with all requirements of the Specifications and/or Scope of Work. Labor shall be billed at the applicable hourly rates provided by the Contractor in the Job Authorization Form. Emergencies occurring outside the

normal work hours will be billed at the emergency hourly rates. Emergencies occurring within the normal work hours will be billed at the normal hourly rates, but emergency response time is required.

Critical Emergencies: Critical Emergencies are incidents which require rapid response and pose an immediate detrimental impact on the function of the communication/computer systems, components or dependent services. The Contractor will be required to maintain an Emergency Service Hot Line 24 hours a day, seven days a week, 52 weeks a year. The contractor will be required to respond on-site within two (2) hours of the emergency call being made to the Contractor.

General Emergencies: The Contractor will be required to maintain an Emergency Service Hot-Line 24 hours a day, seven days a week, 52 weeks a year. General emergencies are equipment outages that require rapid response but do not pose an immediate system problem. The Contractor will be required to respond on-site within four (4) hours of the call being made to the Contractor.

GROUP 2 – Technology and Enterprise Business Solutions (TEBS) - Fibernet HUB Sites

1.4 DESCRIPTION

The following is a brief description of the Fibernet system, and the Manufacturers part numbers used at all County Fibernet Hub Sites.

Montgomery County has 10 DC power plants deployed throughout the County's Fibernet system. All 10 of these systems are the AGM-600 Amp Power Plant (Ratelco or C & D Technologies) with Liberty 2000 series VRLA HD300 batteries (24).

The following part numbers and descriptions (extracted from a C & D Catalog PDF) are believed to be the components that make up the entire DC Power Plant System.

The foundation of this system is the AGM-48 Volt, 600 Amp Power Plant, PDS 4200 C&D TECHNOLOGIES' NEW AGM-600 POWER PLANT offers compact, reliable power for -48 Volt telecommunication needs. The power plant combines high power factor and highly efficient modular rectifiers, plug-in circuit breaker distribution, plant monitoring and alarm functions all into one system. Its flexible design can accommodate your current and future system needs with up to 180 Amps utilizing 30 Amp rectifiers and up to 600 Amps with 50 Amp rectifiers. This advanced system is the optimal solution for telecommunication sites where space is limited.

- State-of-the-Art Rectifiers: C&D TECHNOLOGIES advanced 48-Volt, 50 Amp and 30 Amp modular rectifiers feature high efficiency, near unity power factor, and compact size. These hot-swappable modules can be easily installed without tools and without interrupting system operation.
- Front Accessibility: All distribution and battery connections are front accessible, making this plant ideal for confined locations. The AGM-600 can be placed against a wall or in a confined area while still maintaining easy access to vital plant connections.
- Distribution Features: The 48-Volt distribution section will accommodate up to a maximum of 45 plug-in circuit breakers ranging from 5 to 125 Amps. Circuit breakers 50 Amps and less require one breaker position, circuit breakers 60 to 100 Amps require two breaker positions, and 125 Amp circuit breakers require three breaker positions.
- Digital Metering: A 4 digital ammeter/voltmeter is provided for fast and accurate system monitoring. An on-line test and calibration circuit utilizes the digital meter to set up and test alarm functions with no service interruptions.
- Power Plant LEDs/Alarms: Standard power plant LEDs include: Power on, float/equalize status, major-minor alarms, high-low DC Voltage alarms, rectifier failure, LVD status and optional high temperature alarm. Standard alarm form "C" contacts include: major (2 sets), minor, high DC Voltage, low DC Voltage, load circuit breaker trip, LVD status and optional high temperature.
- Optional Low Voltage Disconnect: The optional Low Voltage Disconnect protects the load from low Voltage and the system batteries from damage due to over discharge.
- Optional Temperature Compensation and High Temperature Alarm: High temperature can damage and shorten the battery life. This option will automatically monitor and adjust the rectifier output Voltage to compensate for variations in battery temperature.

- Space Saving Design: The AGM-600 Power Plant can be configured for mounting directly on top of C&D PowerCom Liberty 2000 Series VRLA batteries to save valuable floor space.

AGM-600 STANDARD FEATURES

- 600 Amp rated distribution module with positions for 24 plug-in circuit breakers
- Digital meter and alarm
- One 180/200 Amp power shelf
- Front accessible power plant
- 4 digit ammeter/voltmeter
- Compatible with all C&D PowerCom Liberty 1000 and 2000 Series VRLA or flooded batteries

OPTIONAL FEATURES present on some of the County's C & D Power Plant Systems

- Various relay racks, both floor mounted and battery mounting
- Low Voltage disconnect (List 2 or 4)
- Battery temperature compensation and high temperature alarm
- Additional power shelves
- Front access AC power wiring options
- Distribution option to add 21 breaker positions, 5-125 Amps

PLANT SPECIFICATIONS

Temperature: -40° to 65°F (0° to 50°C with 30 Amp rectifier)

Humidity: 0 to 95% non-condensing

Height: w/one 200A shelf (50 Amp rectifiers) 24 ½" (62.23 cm)
 w/two 200A shelves (50 Amp rectifiers) 36 ¾" (93.3 cm)
 w/three 200A shelves (50 Amp rectifiers) 49" (124.5 cm)
 w/one 180A shelf (30 Amp rectifiers) 21" (53.3 cm)

Depth: 16.9 inches (42.93 cm)

Width: 23" rack mounting (58.4 cm)

Weight: Approximately 225 lbs (102 kgs) with four 50 Amp rectifiers mounted in a 7' rack
 Approximately 220 lbs (99.8 kgs) with six 30 Amp rectifiers mounted in a 7' rack

Heat dissipation, full load:

4,576 Btu/hr e/w four 50 Amp rectifiers

4,116 Btu/hr e/w six 30 Amp rectifiers

Audible Noise:

Less than 55 dBa as measured 5 feet up and 2 feet from rectifier

ORDERING GUIDE

Part Number	Description	Comments
110-4200-L1	Basic power plant with one 200 Amp power shelf for 50 Amp rectifier system, 24 breaker positions, without LVD	For up to four 50 Amp rectifiers. Rectifiers, relay racks and circuit breakers must be ordered separately.

*110-4200-L2	Basic power plant with one 200 Amp power shelf for 50 Amp rectifier system, 24 breaker positions, with LVD.	For up to four 50 Amp rectifiers. Rectifiers, relay racks and circuit breakers must be ordered separately.
110-4200-L3	Basic power plant with one 180 Amp power shelf for 30 Amp rectifier system, 24 breaker positions, without LVD.	For up to six 30 Amp rectifiers. Rectifiers, relay racks and circuit breakers must be ordered separately.
110-4200-L4	Basic power plant with one 180 Amp power shelf for 30 Amp rectifier system, 24 breaker positions, with LVD	For up to six 30 Amp rectifiers. Rectifiers, relay racks and circuit breakers must be ordered separately.
*100-7500-00	HFM48AC5O, 50 Amp rectifiers	Up to four per shelf
100-7530-48	HFM48AC3O, 30 Amp rectifiers	Up to six per shelf
385-5685-00	One additional 200 Amp rectifier shelf (50 Amp rectifiers)	Load upgrade to 400 Amp for p/n 11 0-4200-L1/L2
385-5686-00	Two additional 200 Amp rectifier shelves (50 Amp rectifiers)	Load upgrade to 600 Amp for p/n 1 10-4200-L1/L2
Future Release	One additional 180 Amp rectifier shelf (30 Amp rectifiers)	Load upgrade to 360 Amp for p/n 11 0-4200-L3/L4
385-5684-00	Additional 21 position DC distribution circuit breaker	Maximum one distribution option per system
*385-5687-00	Battery temperature compensation and high temperature alarm kit.	Includes one ambient and three battery temperature sensors and one high temp alarm relay
385-5688-00	Front access AC wiring option kit for one — 50 Amp rectifier shelf	For basic 11 0-4200-L1/L2 plant
385-5689-00	Front access AC wiring option kit for two — 50 Amp rectifier shelves	For basic 110-4200-Li /L2 plant
385-5690-00	Front access AC wiring option kit for three —50 Amp rectifier shelves	For basic 11 0-4200-L1/L2 plant
*271-0161-00	5 Amp load circuit breaker	Takes one breaker position
271-0162-00	10 Amp load circuit breaker	Takes one breaker position
271-0163-00	20 Amp load circuit breaker	Takes one breaker position
271-0160-00	25 Amp load circuit breaker	Takes one breaker position
*271-0164-00	30 Amp load circuit breaker	Takes one breaker position
271-0165-00	40 Amp load circuit breaker	Takes one breaker position
271-0166-00	50 Amp load circuit breaker	Takes one breaker position
274-3796-60	60 Amp load circuit breaker	Takes two breaker positions
*274-3796-70	70 Amp load circuit breaker	Takes two breaker positions
*274-3796-80	80 Amp load circuit breaker	Takes two breaker positions
274-3796-90	90 Amp load circuit breaker	Takes two breaker positions
*274-3796-100	100 Amp load circuit breaker	Takes two breaker positions
274-3796-125	125 Amp load circuit breaker	Takes three breaker positions
*	Present on County systems	

Rectifier Specification for HFM48BC50, 48 Volt, 50 Amp (Brochure #10-343) (see C & D Brochure #10-345)

Rectifier Input Voltage:	208/220/240 VAC, single-phase, 50/60 Hz
Rectifier Input Current	15 Amps at 208 Volts 14 Amps at 220 Volts 13 Amps at 240 Volts
Rectifier recommended branch AC circuit breaker	30 Amps
Rectifier Heat Dissipation	1,054 Btu/hr @ 54 Volts
Power Factor	0.99
Efficiency	89%
Input Protection	Two pole AC circuit breaker
Output Adjustment	Float/Equalize adjustment 48 to 60 Volts
Regulation	Output Voltage remains within $\pm 0.5\%$ for any load current (no load to full load) within the specified input Voltage and frequency ranges.
Filtering	Voice band: less than 32 dBnC Wide band noise: less than 250 mV, peak-to-peak, with 20 MHz band width
Output Protection	DC circuit breaker and electronic current limit
Turn-on	Soft start
Load Share	Rectifiers will share within $\pm 10\%$ from 10 to 100% rectifier capacity
EMI	Complies with FCC Part 15, Subpart J for class A equipment VDE-0875, Class N
Weight	27 lbs (12.3 kg)

STANDARD 23" FLOOR MOUNTING RELAY RACK

Rack Part Number	Rack Height
170-0029-10	4'0"
170-0024-10	5'0"
170-0025-10	6'0"
170-0023-10	7'0"
170-0022-10	7'6"

Additional Part #'s and Descriptions

Part Number	Description	Comments
Guardian XP or Multitel MXP2 188 V3 System	34 analog and 48 binary input remote monitoring system.	Multipurpose remote monitoring and control of the DC Power Plant
Web Gate (Multitel) M-3545 with K-354#2 Kit	Ethernet interface for MXP2 188.	Provides real time status, via data network.
Liberty 2000 Battery System HD300	Each system consists of 24 Liberty HD300 VRLA (valve regulated lead-acid) batteries.	6 batteries per rack, 4 racks per system.

1.5 SEMI-ANNUAL INSPECTION, TESTING

Preventative maintenance expectations for the Montgomery County FiberNet C&D (Ratelco) AMG 600 Power Plant, MultiTEL Web Gate, and Guardian XP (MXP2 G188 Remote Monitoring System).

- Coordinate with customer (TEBS) for preventive maintenance at least three weeks prior to the anticipated site visit.
- Review prior maintenance history to determine if any conditions were noted on previous visits that require follow-up action.

Any Maintenance activity that takes the battery plant “out of circuit” requires that the on-site Genset be started and confirmed ready for operation by verifying the “Source Available – Emergency” LED indication is lit on the ASCO Automatic Transfer Switch.

In response to RFP provide any additional procedures and suggestions that improve the preventative maintenance of the fiber net site DC power plants.

GROUP 3 - Montgomery County TEBS (RADIO SHOP) required Maintenance Procedures/Checklist

- 1.5.1 Check for any alarms or conditions that would necessitate deviating from below scope of work and if so, notify customer immediately and do not proceed until options have been discussed and approved by customer. Such alarms or conditions include but are not necessarily limited to:
- a. Loss of N+1 rectifier module redundancy.
 - b. Swollen or leaky battery jars.
 - c. Corroded battery posts or links.
 - d. Loss of air conditioning
 - e. Water on floor.
 - f. Signs of overheated connections.
 - g. Ambient temperature over 85 degrees F
- 1.5.2 Using a calibrated (certified) Fluke 87 or equivalent DMM:
- a. Measure and record battery plant DC float voltage,
 - b. Half string voltages,
 - c. AC ripple voltage,
 - d. DC charge current,
 - e. AC ripple current.
- 1.5.3 Using an Alber Cellcorder or equivalent battery tester, measure and record:
- a. All individual cell voltages,
 - b. All individual cell internal impedances,
 - c. Inter-cell link resistances.
- 1.5.4 Verify/calibrate rectifier current meter against rectifier current test jacks. In Semi-Annual, visit (refer to previous visits ticket) re-torque battery links using torque wrench.
- 1.5.5 If all the above battery checks are normal, lower the rectifier float voltage just sufficient to cause full load current to be supplied by battery plant. Allow this condition to exist for 10 minutes then record battery string and half string voltages. Return rectifiers to full float and immediately scan battery posts and terminals with a hand-held infrared temperature probe.
- 1.5.6 Review all the above battery plant data, for absolute value compliance as well as comparing against results from previous visit. If any conditions are noted that would jeopardize continuous power to the load during the remainder of the PM, notify the appropriate contract administrator/designee immediately to discuss options and obtain permission before proceeding.
- 1.5.7 Verify proper fan operation on all plug-in rectifier modules.
- 1.5.8 Contact the AOC indicating that a rectifier is being removed and a “Minor Rectifier Alarm” is expected.

- 1.5.9 Cycle the spare rectifier module, if available on site, back into operation. Return to spare the oldest in use Rectifier.
- 1.5.10 Vacuum and clean all surface areas with appropriate cleaning techniques. This shall include all surfaces of the Battery/Rectifier System and the spaces immediately adjacent to it. Pay particular attention to horizontal surfaces and the immediate floor area.
- Remove remaining rectifier modules one at a time, clean with vacuum and LP air then place back into operation.
 - Open door on system shelf, clean with vacuum and LP air.
- 1.5.11 Verify system shelf digital meter calibration for proper voltage and current readings. If required, recalibrate following Factory recommended procedures.
- 1.5.12 As each Hub might have slightly different settings and actions, each site setting must be confirmed by the County or the County's System Integrator. Verify/calibrate system shelf settings for:
- a. High Voltage Shutdown (HVS)
 - b. High Voltage Alarm (HVA)
 - c. Low Voltage Alarm (LVA)
 - d. Over-temperature (TEMP) (Use heat gun and IR temp probe)
 - e. Minor Alarm
 - f. Major Alarm
 - g. With LVLD in Bypass:
 - i. Low Voltage Load Disconnect (Drop-out)
 - ii. Low Voltage Load Disconnect (Pick-up)
 - h. Float Voltage
 - i. Equalize Voltage
 - j. Plant Current
- 1.5.13 Verify/calibrate rectifier module load sharing per Written Factory procedures.
- 1.5.14 Using front panel display of Guardian XP, verify that display concurs with values and events as follows:
- a. System general information mode:
 - Unit ID, name, date, time, baud rate, TEL line state, software version.
 - b. Analog channels:
 - Name, scale, sign, threshold values and analog value:
 - 1) AN1 - DC Float Voltage
 - 2) AN2 - System Load Current
 - 3) AN3 - Ambient Temperature
 - 4) AN4 - Battery Charge/Discharge current
 - 5) AN5 - Mid-point string voltage
 - 6) AN6 - Rectifier AC input Voltage
 - 7) AN7 – Generator Approach Low Oil
 - 8) AN8 thru 11 (Not used)
 - 9) AN12 – Battery string top row temperature
 - 10) AN13 – Battery string middle row temperature
 - 11) AN14 – Battery string bottom row temperature
 - 12) AN15 – Battery string ambient temperature
 - 13) AN16 – Theory Midpoint
 - 14) AN17 – Delta Midpoint
 - 15) AN18 – Delta Temperature 1
 - 16) AN19 – Delta Temperature 2
 - 17) AN20 – Delta Temperature 3
 - 18) AN21 – Plant Power
 - 19) AN22 – Battery Power
 - 20) AN23 – Battery Ampere Hour
 - 21) AN24 – Discharge Peak Ah
 - 22) AN25 – ANA12+ANA13

- 23) AN26 – ANA25+ANA14
- 24) ANA27 - Average Battery Temperature

c. Binary input channel:

Name, BRG margin voltage, Battery Margin Voltage and masking time.

- 1) E1 – Over-temperature alarm
- 2) E2 – DC Distribution Breaker tripped
- 3) E3 – Low Voltage Alarm
- 4) E4 – High Voltage Alarm
- 5) E5 – High Voltage Alarm
- 6) E6 – Low Voltage Load Disconnect
- 7) E7 – Minor Alarm
- 8) E8 – Major Alarm

d. Programmable output channels

Name, state, operating mode, activation and deactivation delay:

- 1) OC1 thru OC8 Not Used
- 2) OC9 – Low Voltage Load Disconnect (with LVLD in Bypass mode)
- 3) OC10 – High Voltage Shutdown
- 4) OC11 – Equalize
- 5) OC12 – Rectifier Re-start

e. Automatic equalize:

Name, state, voltage ON, voltage OFF, delay ON or current OFF and maximum duration.

f. Cyclic Equalize:

Name, state, start time, duration and TEMP OFF

Repair/Calibrate any Guardian XP functions not operating properly.

- 1.5.15 Inform the AOC indicating that preventive maintenance has been completed by the contractor. Request that the Fibernet On-Call personnel should be informed.
- 1.5.16 Complete service tickets, notify Montgomery County TEBS that PM is completed, and advice of any conditions noted that would be cause for immediate action, leave copy of service ticket on site. Leave a copy of service ticket and all test results (portable printer is required by the Contractor)
- 1.5.17 Copy of report to be included in summary report sent to the appropriate contract Administrator/Designee after completion of all sites – regular reports.

GROUP 4 – DOT – TRAFFIC MANAGEMENT

1.6 Routine inspection and Maintenance Annual Inspection and Testing

All inspections and testing shall be performed on **an annual** basis. Any battery that reached its warranty period shall be scheduled for replacement first. Any battery charges that fall below 80% of their rated capacity must also be replaced.

- a. The contractor shall perform preventative maintenance of uninterruptible power supplies by checking UPS Unit for proper operations. Clean fan filter by removing it in accordance with the manufacturer's recommendations.
- b. Perform visual checks of UPS equipment and wiring.
- c. Repair or replace as required damaged wiring and connections.
- d. Replace Battery mat.
- e. Check all nuts, bolts, screws, and connectors for tightness and heat discoloration. Inspect for broken, brittle, damaged, or heat stressed components and cables.

- f. Repair or replace uninterruptible power supplies components, including batteries, in conformance with manufacturers' recommendations.
- g. Perform battery maintenance. This shall include cell voltage readings and an overview inspection of the battery strings condition. Check all battery connections for the proper torque and ensure they are free of corrosion. Check batteries for cracks or leaks. Correct any noticeable discrepancy if found, such as a corroded connection or a loose wire.

1.6.1 Perform UPS operational test procedure as follows:

- a. Place the UPS Unit into self-test in accordance to manufacturer's instructions.
- b. After passing the self-test disconnect the AC input to the UPS so that the UPS operates in backup mode.
- c. Perform an operational test of the system including unit transfer to and from bypass.
- d. Perform an operational test of the system including unit transfer to and from batter
- e. Reconnect the AC input and ensure the signal is on AC power.
- f. The contractor must submit to the contract Administrator /designee a detailed written report of the results of each UPS tested, including any recommendations for major repairs or replacements of UPS components. The contractor will be paid for parts and materials for any UPS components or parts repaired or replaced. The repair and replacement components will be on as needed basis. When in the opinion of the contractor, a component needs to be replaced, an immediate verbal report and a not to exceed estimate must be provided. If the work is authorized by the contract administrator /designee, it must be performed and billed as described under the "Additional Work", (See section C, item 3.2) of the RFP.

1.6.2 GENERAL REQUIREMENTS

1.6.2.1 STANDARD SPECIFICATIONS CODES AND LAWS

- a. Except as otherwise indicated, all work done under this Contract shall conform to:
- b. Scope of Services and contract provision under the Département of General Services Critical Powe System Support Services
- c. The Maryland State Highway Administration "Standard Specifications for Construction and Materials" January 2008 or latest revisions.
- d. The Maryland State Highway Administration "Book of Standards, Highway and Incidental Structures" Category 8-Traffic including any subsequent revisions, addenda, amendments and/or supplements, and interpretations.
- e. Maryland Manual on Uniform Traffic Control Devices for Streets and Highw2011 Edition.
- f. National Electrical Manufactures Association (NEMA) TS -2-2003 Standards Publication, and latest amendments or revisions.
- g. National Electrical Code (NFPA70) and the National Electrical Safety Code
- h. All work shall be in accordance with the National Electrical Code and the National Electrical Safety Code and shall also conform to State and local laws and ordinances governing such work and to the rules and regulations of the electric utility serving the facility.

Hereinafter, these documents will be referred to as the "Standard Specifications" and are hereby incorporated by reference into this Contract. In case of conflict between the Standard Specifications, and any provision of this Contract, the Contract shall govern. However, the Bidder or Contractor should request interpretation from the Engineer.

1.6.3 WORKMANSHIP AND LICENSE REQUIREMENT

1.6.3.1 The Contractor shall perform all work to a high degree of workmanship. Items such as improperly set couplings, unreamed conduit ends, and concrete or masonry work that are not up to the standard specifically required by the Contract shall be removed and replaced at no cost to the County.

1.6.3.2 A Master Electrician's License issued by the State of Maryland is required in order to perform electrical work in Montgomery and to ensure workmanship applied to installation of the electrical components of traffic signal and ATMS work.

1.6.4 CONTINUITY OF OPERATION

1.6.4.1 The traffic signal shall remain operational during the UPS maintenance. The Contractor shall take every precaution to assure that disturbance of the normal signal operation is minimized. At no time will the entire signal be turned off without prior approval of the Engineer.

1.6.4.2 The Contractor shall not make any changes in the operational functioning, phasing, or timing of any traffic signal.

1.6.4.3 The Contractor shall schedule the UPS maintenance work with the engineer in advance and obtain approval before performing any UPS maintenance work.

1.7 ADDITIONAL WORK

When as a result of Semi-Annual inspection and testing as described in Section C, Item 3.5, or for other reasons, major repairs, alterations or services on the listed UPS (or other County UPS) are found to be necessary, the Contractor shall inspect the work needed and provide a "Not-To-Exceed" written cost estimate (Attachment I) to perform the work and a time schedule for completion. Written estimates must be signed by the Contractor and should include: a brief description of the work; estimated labor hours, material list, material costs and estimated completion date. Upon approval of the estimate by the Contract Administrator or designee, the Contractor shall proceed with the work.

Final billing for the work will include only the actual labor and materials used for the work. Labor must be billed at the hourly rates provided by the Contractor in the "Additional Work" Quotation Sheet. Payment for additional work will be approved when the Contract Administrator has established that the work was accomplished acceptable in light of the requirements set forth above.

If the "Not-To-Exceed" estimates are determined to be excessive in cost or completion dates, the County may perform the work using in-house resources or other Contractor as deemed appropriate.

On request from the County, the Contractor must provide hands-on instruction to County personnel in the operation, safety precautions, and recommend supplementary inspections of the UPS equipment. The instruction will be requested by the Contract Administrator and be done in accordance with the procedures for Additional Work.

1.8 EMERGENCY CALL BACK SERVICE

The Contractor must respond to requests for emergency services as defined herein. The Contract Administrator/Designee reserves the right to specify what constitutes the emergency situation. Emergency services will comply with all requirements of the Specifications and/or Scope of Work. Labor must be billed at the hourly rates provided by the Contractor in the "Additional Work" Quotation sheet. Emergency labor rates are only used if work is done outside regular working hours.

- **Critical Emergencies:** Critical emergencies are incidents which require quick UPS repair and pose an immediate detrimental impact on the function of communication/computer systems, components or dependent services. The Contractor will be required to maintain an Emergency Service Hot Line 24 hours a day, seven days a week, in 365 days of the year. The Contractor will be required to respond on-site within two (2) hours of the emergency call being made to the Contractor.
- **General Emergencies:** The Contractor will be required to maintain an Emergency Service Hot Line 24 hours a day, seven days a week, 365 days of the year. General emergencies are UPS breakages that require quick repair, but do not pose an immediate system problem. The Contractor will be required to respond on-site within six (4) hours of the call being made to the Contractor.

5.4. Contractor's Qualifications

Contractor must be an established UPS firm experienced in providing UPS services of the types and nature and to the extent outlined in these specifications for the past five (5) years.

Contractor must provide supervision and qualified personnel to ensure competent performance of the work. The bidder must provide evidence by responding to this RFP of experience in providing UPS and garages emergency lighting inverters design, installation, maintenance and repair services. The bidder must be an established entity with experience in providing UPS services of the types and to the extent as defined in these specifications and evidence that the Contractor has successfully conducted such operations for a period of not less than five (5) years. Contractor will be responsible for the proper conduct of all Contractor personnel while on County premises. Contractor shall not employ any person or persons in or about the premises who shall use improper language or act in a loud or boisterous manner. Contractor agrees to dispense with the services of any employee whose conduct the Contract Administrator/Designee confirms is detrimental to the best interest of the County. Substitution or replacement of any person assigned to the contract and named in the proposal shall be with a person of comparable education, knowledge and training. The Contract Administrator/Designee must approve the replacement personnel in writing.

The Contract Administrator/Designee reserves the right to approve or request the removal of any person assigned by the Contractor to perform work under the contract. The UPS technicians must be able to communicate clearly in the English language. No change of personnel shall be made without the written approval of the Contract Administrator/Designee. Substitution of personnel named in the proposal must be with a person of comparable education, knowledge, and training.

5.5. Contractor's Responsibility

The Contractor shall work from verbal and/or written instructions, sketches, or drawings. The Contractor is to have sufficient resources to be able to respond to more than one (1) job at any given time.

The Contractor must submit daily time ticket(s) with their invoices to the Contract Administrator/Designee. The daily time ticket(s) must contain the name(s) of UPS technicians, together with hours worked on that date, a brief description of the daily activities and a list of all materials used for that day.

The County reserves the right to request a background investigation, based on the facility being serviced, from the Contractor for any or all the Contractor's employees or subcontractors under this Contract, at any time while the contract is in place. Background investigation should be performed by the County only and the standard is a criminal background investigation that bars entry for parties with criminal convictions pertaining violent crimes, felonies, terrorism etc.

5.6. County's Responsibility

The County, through its approval of the individual JAF, will be responsible for the assignment of specific tasks, the requisition of funds (Purchase Orders), providing general guidance, and timely payment of invoices based on uninterrupted power supply services completed.

5.7. Reports/Deliverables

Any time a service is requested from contractor emergency and urgent. The contractor must provide a complete service report.

Provide the following on the service report for PM and T&M work.

1. Workorder #
2. Site name, address, location of the UPS in the building (provided by County, verified by Contractor)
3. Make and model of UPS
4. Serial number of the UPS
5. Date of service, technician name provided the service
6. Rating of the UPS in KVA/KW
7. Percent % of load on UPS
8. Contact name for group as provided by the County

At the end of each preventative maintenance period, a report should be provided listing all UPS systems that had PM Services and then sent to the respective group project managers.

6. SECTION C - PERFORMANCE PERIOD

6.1. TERM

- 6 The effective date of this Contract begins upon signature by the Director, Office of Procurement. The period in which Contractor must perform all work under the Contract begins upon the County's issuance of a Notice to Proceed and ends after a two (2) year period. Contractor must also perform all work in accordance with time periods stated in the Scope of Work. Before this term for performance ends, the Director at his/her sole option may (but is not required to) renew the term. Contractor's satisfactory performance does not guarantee a renewal of the term. The Director may exercise this option to renew this term three (3) times for one (1) year each.

6.2 PRICE ADJUSTMENTS

- 6.2.1 Prices quoted are firm for a period of two (2) years after execution of the contract. Any request for a price adjustment after this two-year period is subject to the following:
- 6.2.1.1. Approval or rejection by the Director, Office of Procurement or designee
 - 6.2.1.2. Submission in writing to the Director, Office of Procurement and accompanied by supporting documentation justifying the Contractor's request. A request for any price adjustment may not be approved unless the contractor submits to the County sufficient justification to support that the Contractor's request is based on its net increase in costs in delivering the goods/services under the contract.
 - 6.2.1.3. Submission within sixty (60) days prior to contract expiration date, if the contract is being amended.
 - 6.2.1.4. The County will not approve a price adjustment request that exceeds the amount of the annual percentage change of the Consumer Price Index (CPI) for the twelve-month period immediately prior to the date of the request. The request must be based upon the CPI for all urban consumers issued for the Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan area by the United States Department of Labor, Bureau of Labor Statistics for ALL ITEMS.