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Cherokee County Board of Commissioners
Purchasing Department
1130 Bluffs Parkway, Canton, GA 30114
Phone: (678) 493-6000
Fax: (678) 493-6035

# REQUEST FOR BID/PROPOSAL

## RFB 2017-122 Public Safety UPS

**THE PROJECT:** The Cherokee County Board of Commissioners Purchasing Department (County) is requesting competitive sealed ☐ Bids or ☒ Proposals in support for an Installed Uninterruptable Power Supply- as described herein.

There ☒ will be ☐ will not be a mandatory meeting to review the requirements. The meeting will be held at the proposed work site and will include walking the area. During the meeting the vendor will be required to complete a load test that shall be submitted with the vendor's proposal. Vendor will be responsible for bringing all necessary equipment to complete the load test. Meetings will be scheduled in two hour blocks from 6/21/2017 to 6/23/2017. A meeting time shall be reserved at least two days prior to the meeting date by contacting Matt Black at rmblack@cherokeega.com. A background check may be necessary.

The term of Agreement(s) resulting from this solicitation can be found in the Statement of Work.

All times in the solicitation are local times to Cherokee County Board of Commissioners, 1130 Bluffs Parkway, Canton, Georgia 30114.

The County reserves the right to reject any or all bids/proposals, to waive technicalities and to make a selection and final award as deemed to be in the best interest of the County, including using any form of contract it deems most advantageous to the County. The County further reserves the right to reject the bid of any vendor who has previously failed to perform properly or complete on time contracts of a similar nature, or who upon investigation shows is not in a position to perform the contract. Incorporated herein by this referen2ce are Cherokee County's Standard Solicitation Terms and Condition.

**SCHEDULE:**

| | |
|---|---|
| **Issued** | 6/13/2017 |
| **Site Visit/Pre-Bid Meeting** | 6/21/2017 – 6/23/2017 |
| **Questions Due** | 6/26/2017 |
| **Answers Due** | 6/29/2017 |
| **Bids/Proposals Due** | 7/6//2017 at 12 PM |
| **Anticipated Award Date** | 7/18/2017 |

## THE EXPECTED PERIOD OF PERFORMANCE IS:

The base period of performance is broken down into two areas; Physical Delivery of Product(s) and Service Delivery. This is a function of the Statement of Work (SOW) and/or specification and reflects if there is physical item or items to be delivered and / or delivery of services. An X in the box corresponding to item 1 below, Physical Delivery indicates a physical item or items are to be delivered and an X in the 2. Delivery of Services indicates that Services are to be performed. Either or both may apply to the work contemplated by this solicitation.

Additionally, should there be and X in the box corresponding item 3. Option Grant, then the County requests the right to extend the period of performance beyond the Base Rate as specified.

1. ☐ NO PHYSICAL ITEMS ☒ PHYSICAL DELIVERY REQUIRED:

   For Physical Delivery solicitations, the period of performance for an award shall begin with either the placement of Purchase Order or the date indicated on the Agreement. All items to be delivered are to be FOB Cherokee County at the address indicated in the solicitation. Performance shall be complete upon final acceptance by the County. Time is of the essence for the delivery of each item specified.

2. ☐ No SERVICES REQUIRED ☒ PERFORMANCE OF SERVICES:

   For Performance of Services solicitations, the period of performance shall begin with the placement of either a Purchase Order or the date of the Agreement unless the Agreement, the SOW or the Solicitation Terms indicate that performance shall begin upon the issuance of an Authorization to Proceed (ATP), in which case the ATP would represent the beginning of performance.

   ☐ OPTION GRANT:

   This solicitation contains requested options; please see pricing sheet for details.

**SUBMITTAL INSTRUCTIONS:** Interested Bidders/Proposers should carefully review the requirements defined herein and provide complete and accurate submissions that should include the following items (if indicated by an X in the box:

- ☒ Information and Addenda Acknowledgement Form (Appendix A),
- ☒ Non-Influence and Non-Collusion Affidavit (Appendix B),
- ☒ E-Verify Affidavit (Appendix C),
- ☒ References* (Appendix D),
- ☒ Acceptance of County' Standard Agreement**, as below: (Appendix E),
  - ☒ Professional Services Agreement
  - ☐ Construction Services Agreement
  - ☐ Other:_____
- ☒ Suspension, Debarment and Litigation Affidavit (Appendix F),
- ☐ Contractor's License Certification (Appendix G)
- ☐ Bonds Requirements if the price bid > $100K
  - ☐ Ability to Provide Performance, Labor & Matl. Payment Bond (Appendix H)
  - ☐ Bid Bond (See Appendix I)
- ☒ Evidence of/ability to provide Insurance at the limits identified herein,***
- ☒ Certifications, Licenses or Registrations as required by law and/or as requested.
- ☐ Pricing on the Pricing Form provided (Bid Form)
- ☐ Contractor's Qualifications Statement (Appendix J)
- ☐ Added Terms to Construction Service Agreement (Attachment)
- ☐ Substitutions Proposed: See Instructions Standard Solicitation Terms****, Item 9
- ☐ _____
- ☐ _____

Notes:

*The County reserves the right to contact not only those references provided, but may also use previous performance for the County, other contacts it identifies and other sources of information believed to be viable to evaluate capability, viability and performance.

**If Acceptance of County's Standard Agreement is checked, all work/items defined herein are to be quoted according to these requirements. Copies of these agreements can be located at the County's Procurement web page.

***Insurance levels requested are those identified in the County's Standard Agreement, section "I."

****Standard Solicitation Terms Refer to Cherokee County Standard Solicitation Terms and Conditions

## EVALUATION CRITERIA:

Bids/Proposals that contain options or additive work above and beyond the base bid will be evaluated financially according to the criteria described in the solicitation. However, should the use of options or additive work proposed exceed the County budget, the County retains its rights to address such situations as described in its Standard Terms For Bid and Proposal Solicitation as well as the right to award based on the base bid only or the base bid plus quoted additive work that is within its budget.

☐ Bids determined to be Responsive and Responsible will be ranked based Bid Form Criteria.
OR
☒ Proposals determined to be Responsive and Responsible will be evaluated on the following criteria:

| | |
|---|---|
| 50 % | Price |
| 20 % | Design |
| 10 % | Experience |
| 10 % | Installation Plan |
| 10 % | Warranty/Maintenance |
| 100% | TOTAL |

### HOW AND WHERE TO SUBMIT BIDS AND PROPOSALS:

The County has two methods for receiving bids and proposals that are mutually exclusive; either electronically or by physical receipt. The box with the "X" below indicates how and where bids or proposals are to be submitted. The County will NOT accept proposals by fax, or e-mail unless authorized, in writing, by the Procurement Director. The solicitation submission deadline will be strictly enforced; no late bids/proposals will be accepted for any reason, please plan accordingly.

**A. Electronic Submissions Only:**

☒ Bids and Proposals are to be submitted electronically ONLY to the County's designated Web site or location. Physical copies are not to be submitted unless approved in advance by the Purchasing Director.

Proposals and all requested documentation to be provided electronically should in the Adobe Portable Document Format (PDF) unless otherwise indicated in these solicitation instructions. Documents provided in response to this solicitation are to be named according to the following naming convention:

a. [Solicitation Number]_[Vendor Name]_[Document Type]
Example: "2017-111_ABC Company_Proposal"

**AND/OR**

**B. Physical Submissions Only:**

☐ Bids and/or Proposals are to be submitted on-time and ONLY in physical (paper) form and delivered to Cherokee County Procurement Department, Solicitation #_____ 1130 Bluffs Parkway, Canton GA 30114. On-line submissions are not to be tendered without the advanced approval of the

Purchasing Director.

Number of Submittals: 1 Original

**QUESTIONS/ADDENDA:** Only written inquiries will be permitted during the solicitation period. Questions are to be submitted via email to the Purchasing Agent for this solicitation at: rmblack@cherokeega.com no later than the date and time indicated in the Schedule, as may be amended. Answers will be posted via formal Addendum and only released as part of the solicitation documents on the County's designated website. All interested parties are instructed to monitor the County's website on a regular basis throughout the solicitation period. The final date for posting of Addenda is per the Schedule, as may be amended.

## STATEMENT OF WORK AND/OR SPECIFICATION:

It is the intent of Cherokee County to secure a qualified firm or individual to replace a mix of small UPS units with a new 3-phase UPS (Uninterruptable Power Supply) at the Cherokee County Public Safety campus, located at 498 Chattin Drive, Canton, GA 30115. Each Respondent is responsible for full and complete compliance with all laws, rules, and regulations which may be applicable.
The result of this RFP would be a contract between the successful Respondent(s) and Cherokee County that will satisfy the following objectives:

a. Remove the current UPS units.
    a. The removed UPS units, and any other hardware removed during the RFP and designated by the County, will be retained by the County to be declared surplus or redeployed, at the County's discretion.
b. Provide, install, and integrate a new turn-key, fully operational UPS, including all necessary turn-up operations.
c. Provide a unit that is completely capable of being integrated into a future installation of the APC/Schneider StruxureWare software suite, as well as out-of-the box integration into Solarwinds Orion NPM suite.
d. Provide, install, and integrate any necessary breaker boxes, fuse panels, electrical distribution panels and/or whips, conduit, electrical cables, etc. This list is not exhaustive and is intended to illustrate the scope of work.
e. Provide, install, and integrate new APC rack-mount metered PDUs, appropriate to the intended load, in every rack serviced by the UPS.
f. Provide appropriate operating documents and reference materials.
g. Provide operational training necessary for the new UPS.
h. Install the new UPS with minimal or no downtime that would disrupt the operations of the Cherokee County Sheriff's Office.
i. Establish a maintenance service agreement following installation, which will include at least one minor preventative maintenance visit and one major preventative maintenance visit per year. Comparative pricing will be provided so that the County may decide to pursue either a three year or five year maintenance service agreement. Pricing for support contracts will be listed separately from the cost of the UPS.

This RFP describes a continuous-duty, on-line, solid state, three-phase UPS System. The UPS System shall operate in conjunction with the existing building electrical system, which receives its power from either local utilities or an on-site generator, so as to provide power conditioning and power backup for electronic loads. This document will provide a current list of UPS units and their loads, which will serve as a basis for the Respondent's work. However, Respondents will be responsible for all on-site power audits on current loads to determine the true kVA/Watt requirements for each area of consideration at their own expense. The on-site power audit performed by the Respondent shall include a review of the current wiring and electrical panel layouts to ensure that facilities are compatible with the proposed UPS System, and all results of the power audit will be provided, in the form of a professionally-prepared report to the county, in both paper and electronic formats on USB flash drives.

Any additions or modifications to the current panels or the building's electronic distribution wiring systems shall be noted in detail in the proposal. CSO Property Maintenance electricians will supervise the Respondent's modifications to building facilities. Any major facility modifications required to accommodate the proposed UPS System will be considered a factor in awarding a contract.

**1) <u>UPS MAJOR COMPONENTS</u>**

a. The UPS System shall consist of at least the following components:
   i. APC UPS unit
   ii. One or more battery strings, in a battery cabinet (if applicable)
      1. Batteries or battery modules shall be hot-swappable by users without bringing UPS down or out of service.
   iii. Redundant intelligence modules (as applicable)
   iv. Redundant power modules (N+1), appropriate for the configured load (as applicable)
   v. One or more SNMP monitoring card(s) with environmental monitoring probe (or newest equivalent product from APC)
   vi. One remote PowerDisplay or equivalent display unit, to be mounted in suite J259 or another designated location within range of its capabilities
   vii. External static bypass switch (as applicable)
   viii. Internal maintenance bypass switch
   ix. Internal distribution panel and/or circuit breakers (as applicable)
   x. Remote Emergency Power Off button, labeled as such in a clear and conspicuous fashion, to be mounted in suite J258 and suite J259, or another designated location, and furnished with a hinged cover to avoid accidental pressing of the button.
   xi. Ability to scale past current configured load capacity, in 10kVA steps (or another similar increment), up to the limits of the chassis, using plug-in or add-in modules that do not require disassembling or changing the UPS in a significant way.
      1. I.E.: if Respondent specifies a 20kVA unit, it is expected that the unit be expandable by at least another 10kVA or another similar increment.
   xii. At time of installation, the operating load of the UPS shall be no greater than 40% of the chassis' configured capacity.
   xiii. Estimated runtime, at configured load, of 15 minutes.
   xiv. Any necessary breaker boxes, fuse panels, electrical distribution panels and/or whips, conduit, electrical cables, etc. This particular list is not exhaustive and is intended to illustrate the scope of work.
   xv. APC rack-mount metered PDUs, appropriate to the intended load, in every rack serviced by the UPS.

**2) <u>ALTERNATE MODELS OR MANUFACTURERS</u>**

a. The County has a long history of using APC products and recognizes that it is one of the leading companies in this market segment.
b. The County believes, based on preliminary research, that the Symmetra PX is the most appropriate APC model for this RFP, but Respondent may suggest an alternate APC/Schneider-owned model (including alternate/acquired/merged product lines, which may include but are not limited to Smart-UPS VT, MGE, or Gutor) if they can demonstrate a superior cost-to-benefit ratio and equivalent functionality.
    i. Ability to use an APC963x or equivalent APC SNMP card (with full functionality) in a non-Symmetra or Smart-UPS APC/Schneider model will work in the favor of the Respondent's proposal.
    ii. County may elect to disregard submitted UPS if Respondent fails to demonstrate sufficient similarity of the other brand of UPS in feature and functionality at a superior cost-to-benefit ratio.
    iii. Any non-Symmetra PX unit specified should conform a closely as possible to the "UPS Major Components" heading as is possible, with a detailed analysis of the rationale and/or mitigating factors when the product specified lacks an item or items on the list.
c. Respondents are also free to examine the specifications of the most directly applicable APC UPS model, and propose another UPS from another manufacturer that the Respondent believes would be a superior replacement for the equivalent APC UPS.
    i. County may elect to disregard submitted UPS if Respondent fails to demonstrate sufficient similarity of the other brand of UPS in feature and functionality at a superior cost-to-benefit ratio.
    ii. Any non-Symmetra PX unit specified should conform a closely as possible to the applicable APC/Schneider bid specification document headings as is possible, with a detailed analysis of the rationale and/or mitigating factors when the product specified lacks an item or items on the list.

**3) <u>LOCATION OF EQUIPMENT</u>**

a. Desired location for new UPS is suite J258, which is the electrical room directly adjacent to suite J259, which is the server room.
b. Respondent is to complete a site survey, at their own expense, which will determine if the desired equipment can in fact be located in this room, and that the cooling characteristics of the room and BTU load introduced by the UPS will be compatible and will keep the UPS within its specified operating temperature range.

**4) <u>PRESENT ELECTRICAL LOADS</u>**

a. Vendor shall be responsible for obtaining a definitive power audit of current electrical load at their own expense.
b. All loads details are presented as reported by the UPS units' SNMP monitoring cards:
c. Rack 1
    i. Two APC SMT3000 or equivalent UPS units.
        1. UPS 1 load in watts: 36%. Output current: 8.3A.
        2. UPS 2 load in watts: 20%. Output current: 4.6A
d. Rack 2
    i. Two APC SMT3000 or equivalent UPS units.
        1. UPS 1 load in watts: 18%. Output current: 4.5A.
        2. UPS 2 load in watts: 20%. Output current: 5.1A

e. Rack 3
    i. Future load of two Cisco 6506E switches configured to run on 120VAC and consuming a load of 2000 Watts each.
f. Rack 4
    i. One APC SMT1500 or equivalent UPS.
        1. UPS 1 load in watts: 44%. Output current: 3.9A.
g. Rack 5
    i. Two APC SMT3000 or equivalent UPS units.
        1. UPS 1 load in watts: 46%. Output current: 11.8A.
        2. UPS 2 load in watts: 51%. Output current: 12.9A
h. Network Rack
    i. One APC SMT3000 or equivalent UPS unit.
        1. UPS 1 load in watts: 40%. Output current: 10.5A.
i. Rack 5
    i. One APC SMT3000 or equivalent UPS unit.
        1. UPS 1 load in watts: 5%. Output current: 1A.

**5) <u>ACCESS</u>**

a. This campus being the Public Safety campus, which also houses the Cherokee County Adult Detention Center, all Respondent access shall be contingent upon proper scheduling, security checkpoints, and any background checks deemed necessary.
b. All Respondent access shall require accompaniment by appropriate personnel to and from any and all locations within the Public Safety campus which may prove necessary to visit in the course of the site survey(s) and installation.

**6) <u>SUBMITTALS</u>**

a. Respondent shall furnish the following in their response to the RFP:
    i. Company Profile and Experience: An overview of the proposed manufacturer, distributor, installation team, and service and maintenance team. This should include industry experience, similar project experience, key personnel that will be assigned to this project, training, references, and any other information that would be helpful in determining the quality of the team in selecting and furnishing UPS solutions.
    ii. Installation Plan: Submit a detailed installation plan detailing all phases of the equipment and hardware installation. Installation plan shall include, but shall not be limited to:
        1. Identifying the project manager and/or main systems engineer.
        2. Description of any personnel and/or teams needing access to the Public Safety campus.
        3. Description of the “prep work” prior to the actual installation, including but not limited to:
            a. Modification of any doorways necessary to move equipment into place
            b. Holes needing to be drilled through structural and/or firewall barriers.
            c. Cooling considerations needing to be addressed
        4. Description of all actual installation work, including but not limited to:
            a. Addition/subtraction/modification of any electrical distribution panels or circuits.

b. New conduits needing to be run.
c. Distribution panels.
d. Temporary outages of power while feeds are moved.
e. Wiring trays or pathways needing to be installed or re-routed.

5. Procedures to complete installation, including but not limited to:
    a. Power up procedures.
    b. Burn-in parameters.
    c. Checklists for final testing and acceptance.

iii. Warranty documentation: Submit documentation showing details of manufacturer/Respondent standard and/or extended warranty:
    1. Any supporting manufacturer warranty documentation detailing what warranty comes standard from the factory.
    2. Any supporting Respondent warranty information detailing what their standard warranty is for items purchased from them, as well as the standard warranty for their labor and installation.
    3. A detailed breakdown of any warranty and/or service plan(s) available from the manufacturer and/or Respondent that carry beyond the standard term.

iv. Product Data: Submit product data showing material proposed. Product data shall include, but shall not be limited to, the following:
    1. Proposed system maximum electrical capacity, as well as the as-bid electrical capacity, if the two are different.
    2. As-bid system bill of materials.
    3. Product catalog sheets or equipment brochures.
    4. Product guide specifications.
    5. Product conformance to all applicable ISO/IEC/IEEE/UL standards (this list is not exhaustive and is intended to illustrate the need for product conformance to published standards).

v. Shop Drawings: Submit shop drawings for each product and accessory required. Include information not fully detailed in manufacturer's standard product data, including, but not limited to, the following:
    1. Installation information, including, but not limited to, weights and dimensions.
    2. Information about terminal locations for power and control connections.
    3. Drawings for requested optional accessories.
    4. Detailed drawing showing locations of all Respondent-furnished equipment, relative to the County's equipment, including breaker panels, wiring racks, network enclosures, and floor plans.

vi. Wiring Diagrams: Submit wiring diagrams detailing power, signal, and control systems, clearly differentiating between manufacturer-installed wiring and field-installed wiring, and between components provided by the manufacturer and those provided by others.
    1. Submit system single-line operation diagram.

vii. Operation and Maintenance Data: Submit operation and maintenance data including, but not limited to, safe and correct operation of UPS functions.

1. Submit an installation manual, which shall include, but shall not be limited to, instructions for storage, handling, examination, preparation, installation, and start-up of UPS.
2. Submit an operation and maintenance manual, which shall include, but shall not be limited to, operating instructions.
3. Submit project record equipment drawings.

viii. Load test created at pre-bid meeting.

**7) <u>QUALITY ASSURANCE STEPS</u>**

a. The following steps and/or resources shall be satisfied and/or provided by the Respondent, in order to assure the highest-quality end product for the County.

i. Dedicated project manager

1. Respondent shall designate one project manager as the primary point of contact for all inquiries, planning stages, technical concerns, and design decisions.
    a. This project manager shall have, at time of response, all necessary training and certifications.
    b. The project manager shall have a backup single point of contact, with sufficient training, resources, and access to project documents, to take over temporarily from the primary as needed.
    c. This project manager shall not be reassigned to another project and hand the project over to the secondary, during the length of the project.
2. In case the project manager leaves the employ of the Respondent, it is the Respondent's duty to provide another primary point of contact with sufficient training and certification to take over with no disruption to the County.

ii. Dedicated system engineer:

1. Respondent shall designate one system engineer to handle the technical responsibilities of the project.
    a. This system engineer shall have, at time of response, all necessary training and certifications.
    b. The system engineer shall have a backup system engineer, with sufficient training, resources, and access to project documents, to take over temporarily from the primary as needed.
    c. This system engineer shall not be reassigned to another project and hand the project over to the secondary, during the length of the project.
2. In case the system engineer leaves the employ of the Respondent, it is the Respondent's duty to provide another system engineer with sufficient training and certification to take over with no disruption to the County.

iii. The project manager and system engineer may be the same person or team, but all of the restrictions about a secondary, backup, or replacement still apply.

iv. Pre-Installation Conference:

1. Prior to commencing the installation, meet at the Project site to review the material selections, installation procedures, and coordination with other trades. Pre-installation conference shall include, but shall not be limited to,

the Respondent, Property Maintenance, and a member of the IT department. Date and time of the pre-installation conference shall be acceptable to the County and the Respondent.

v. Detailed project plan
    1. After the pre-installation conference, Respondent will furnish a more detailed version of the project plan furnished in the bid, which will take into account all of the information and design decisions that were finalized in the pre-installation conference.

vi. Periodic progress updates:
    1. The County and the Respondent will establish a weekly progress meeting to make sure the project stays on track. A different time interval may be employed if satisfactory to all parties.

vii. Post-Installation Conference:
    1. When the installation is finished but before the county has signed-off on the project, Respondent shall schedule a meeting with the County and Property Maintenance to review all milestones and address any concerns or open issues.

viii. Manufacturer qualifications:
    1. Manufacturer Qualifications: Manufacturer shall be a firm engaged in the manufacture of static UPSs of types and sizes required, and whose products have been in satisfactory use in similar service for a minimum of 20 years.
        a. The manufacturer shall be ISO 9001 certified and shall be designed to internationally accepted standards.

ix. Respondent Qualifications:
    1. Respondent shall be a firm that shall have a minimum of five years of successful installation experience with projects utilizing static UPSs similar in type and scope to that required for this Project.

x. Regulatory Requirements:
    1. All specified equipment shall comply with applicable requirements of the laws, codes, ordinances, and regulations of Federal, State, and local authorities having jurisdiction. Obtain necessary approvals from such authorities.
    2. Work shall also be designed in accordance with the following:
        a. UL 1778
        b. UL 891
        c. UL 60950
    3. Where applicable, the UPS shall also be designed in accordance with publications from the following organizations and committees:
        a. National Fire Protection Association (NFPA)
        b. National Electrical Manufacturers Association (NEMA)
        c. Occupational Safety and Health Administration (OSHA)
        d. ANSI/IEEE 519
        e. ISO 9001
        f. ISO 14001
        g. ENERGY STAR

xi. Manufacturer QA Program:

1. Each UPS system shall be manufactured and/or assembled in accordance with the manufacturer's Quality Assurance (QA) program.
    a. As applicable, all UPS systems and components shall include the printed "Quality Assurance Test" receipt it receives at the factory. If these receipts must be removed during installation, they shall be retained and furnished to the County upon request.

**8) <u>EXECUTION OF WORK</u>**

a. EXAMINATION OF SITE
    i. Verification of Conditions: Examine areas and conditions under which the work is to be installed, and notify the County of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.
        1. Beginning of the work shall indicate acceptance of the areas and conditions as satisfactory by the Respondent.

b. INSTALLATION
    i. General: Preparation and installation shall be in accordance with reviewed product data, final shop drawings, manufacturer's written recommendations, and as indicated on the Drawings.
    ii. Factory-Assisted Start-Up: If a factory-assisted UPS start-up is requested, factory-trained service personnel shall perform the following inspections, test procedures, and on-site training:
        1. Visual Inspection:
            a. Inspect equipment for signs of damage.
            b. Verify installation per manufacturer's instructions.
            c. Inspect cabinets for foreign objects.
            d. Inspect battery units.
            e. Inspect power modules.
        2. Mechanical Inspection:
            a. Check UPS and external maintenance bypass cabinet internal control wiring connections.
            b. Check UPS and external maintenance bypass cabinet internal power wiring connections.
            c. Check UPS and external maintenance bypass cabinet terminal screws, nuts, and/or spade lugs for tightness.
        3. Electrical Inspection:
            a. Verify correct input and bypass voltage.
            b. Verify correct phase rotation of mains connections.
            c. Verify correct UPS control wiring and terminations.
            d. Verify voltage of battery modules.
            e. Verify neutral and ground conductors are properly landed.
            f. Inspect external maintenance bypass switch for proper terminations and phasing.
        4. Site Testing:
            a. Ensure proper system start-up.
            b. Verify proper firmware control functions.
            c. Verify proper firmware bypass operation.

d. Verify proper maintenance bypass switch operation.
e. Verify system set points.
f. Verify proper inverter operation and regulation circuits.
g. Simulate utility power failure.
h. Verify proper charger operation.
i. Document, sign, and date test results.

c. POST POWER-UP
    i. Burn-in
        1. After unit has been powered-up and is fully operational, Respondent shall perform a burn-in, of a duration no less than 7 days, during which period the unit will not be in production but will be running in normal non-bypass mode.
    ii. Testing
        1. After all tests and burn-in procedures have been completed, Respondent shall schedule a time to bring the UPS fully into the circuit and test its operation. This will be planned out in advance with sufficient time to move any loads that have only one power supply over to UPS power with minimal downtime.
        2. When the unit is fully operational and in-circuit, Respondent shall schedule a time to test the UPS ability to handle the momentary interruption of switching to generator from utility power, and subsequently switching back from generator to utility power.
d. OFFICIAL ACCEPTANCE
        1. At such time that the project is deemed to be completed by both the Respondent and County, the Respondent shall officially hand over the UPS to the County for completion of the project.
e. ON-SITE OPERATIONAL TRAINING:
    i. During the factory-assisted start-up, operational training for site personnel shall include, but shall not be limited to, key pad operation, LED indicators, start-up and shutdown procedures, maintenance bypass and AC disconnect operation, and alarm information.
        1. After the installation of the UPS is complete and the unit has been started-up, the winning vendor shall provide 4 hours of hands-on training in the operation of the UPS and all associated equipment, as well as navigation of the built-in display and online resources of the SNMP management card.
        2. The hands-on training workshop shall include, but shall not be limited to, a combination of lecture and practical instruction with hands-on demonstration. The training workshop shall include, but shall not be limited to, instruction about safety procedures, UPS operational theory, sub-assembly identification and operation, system controls, adjustments, preventative maintenance, and troubleshooting.
        3. This training will be entirely separate from any orientation, written or electronic communication, or verbal description of work performed while the work is ongoing.
f. DEMONSTRATION OF FUNCTIONALITY

i. General: Provide the services of a factory-authorized service representative of the manufacturer to provide start-up service and to demonstrate and train the County's personnel.
ii. Test and adjust controls and safeties. Replace damaged or malfunctioning controls and equipment.
iii. Train the County's maintenance personnel on procedures and schedules related to start-up and shutdown, troubleshooting, servicing, and preventive maintenance.
iv. Review data in operation and maintenance manuals with the County's personnel.
v. Schedule training with the County, through the Architect/Engineer, with at least seven day's advanced notice.

g. UPS SYSTEM REFERENCE & OPERATING MANUALS
   i. The UPS System shall be supplied with sufficient documentation, including a concise operation and installation manual. One hard copy of the Installation and Operation manual and one electronic copy shall be furnished. It shall possess sufficient detail and clarity to enable the CSO Property Maintenance's technicians to understand and operate the system equipment. The manuals shall describe the UPS System in full by including the following major items:
      1. Introduction
      2. Installing the UPS System
      3. Installing and Connecting Batteries
      4. Using Emergency Power-down Controls
      5. Understanding the UPS System Operation
      6. Operational Controls and Features
      7. Using the Control Panel
      8. UPS System Operating Instructions
      9. Using Features and Options
      10. Responding to System Events
      11. Communications
      12. Remote Notification
      13. Maintaining the UPS System
      14. All Other Product Specifications

**9) <u>EQUIPMENT SERVICE PARTS AND PERSONNEL AVAILABILITY</u>**

a. Manufacturer Field Service:
   i. Worldwide Service: The UPS manufacturer shall have a worldwide service organization available, consisting of factory-trained field service personnel to perform start-up, preventative maintenance, and service of the UPS system and power equipment. The service organization shall offer 24 hours a day, 7 days a week, 365 days a year service support.
   ii. Replacement Parts: Parts shall be available through the worldwide service organization 24 hours a day, 7 days a week, 365 days a year. The worldwide service organization shall be capable of shipping parts within four hours to Customer's site.

**10) <u>EQUIPMENT DELIVERY, STORAGE, AND HANDLING</u>**

a. Deliver materials to the Project site in supplier's or manufacturer's original wrappings and containers, labeled with supplier's or manufacturer's name, material or product brand name, and lot number, if any. Store materials in their original, undamaged packages and containers,

inside a well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

i. SHIPPING
    1. CARRIER CONTAINERS: Each cabinet shall be securely palletized and shipped in protective packing and moisture proof materials or containers.

ii. OFF-LOADING:
    1. The awarded Respondent will ensure that all sizable and / or heavy equipment over one hundred pounds is delivered by carrier(s) equipped with off-loading platforms such as an electrical or hydraulic "Tommy Lift" or a fork lift.
    2. The awarded Respondent shall be present at the Public Safety campus when any proposed UPS System equipment is delivered. Furthermore, the Respondent shall visually inspect all proposed equipment for damage before it is off-loaded from the shipping carrier. All shipping damage claims will be handled by the Respondent.

iii. INSIDE DELIVERY:
    1. The Respondent will be responsible for completing a site survey to ensure that all proposed equipment will fit through the hallways and doors necessary to deliver the equipment to the equipment room where it will be installed. The Respondent will state in their proposal whether or not the equipment will fit through said hallways and doors and any costs associated with any disassembly and reassembly of the equipment in order to get the equipment to the installation point.

iv. Respondent presence for off-loading and delivery shall be contingent upon any necessary security precautions deemed necessary, as well as but not limited to any and all conditions laid out in the "ACCESS" subheading of this RFP.

**11) <u>PROJECT CONDITIONS</u>**

a. Extended Warranty: The Respondent shall warrant the work of this Section to be in accordance with the Contract Documents and free from faults and defects in materials and workmanship for period indicated below. This extended warranty shall extend the one year period of limitations contained in the General Conditions. The extended warranty shall be countersigned by the Respondent and the manufacturer.
    i. The UPS shall be covered by a full parts and labor warranty from the manufacturer for a period of twelve months from date of installation.
    ii. The twelve-month warranty period shall be an "advance replacement program", where the Respondent and/or manufacturer furnishes a replacement part within four hours of the call notifying them of the issue.
b. Additional County Rights: The warranty shall not deprive the County of other rights the County may have under other provisions of the Contract Documents and shall be in addition to and run concurrent with other warranties made by the Respondent under requirements of the Contract Documents.

**12) <u>MAINTENANCE</u>**

a. A complete offering of preventative and full service maintenance contracts for the UPS system and the battery system shall be available from the manufacturer. Contract work shall be performed by factory-trained service personnel.

b. It is the county's desire to obtain pricing for ongoing service contracts for the installed hardware, consisting of twice-yearly preventative maintenance visits (one minor and one major). This pricing will be considered separately from the cost of the UPS and installation, and the service contract may or may not be awarded to the supplier/Respondent of the UPS, at the county's sole discretion.
    i. The county may further desire to obtain more data about the ongoing service contracts, specifically the committed response time and committed hardware replacement time for parts and/or modules that fail during the duration of the ongoing service contract.

**13) <u>UPS SYSTEM REFERENCE & OPERATING MANUALS</u>**

a. The UPS System shall be supplied with sufficient documentation, including a concise operation and installation manual. One hard copy of the Installation and Operation manual and one electronic copy shall be furnished. It shall possess sufficient detail and clarity to enable the CSO Property Maintenance's technicians to understand and operate the system equipment. The manuals shall describe the UPS System in full by including the following major items:
    i. Introduction
    ii. Installing the UPS System
    iii. Installing and Connecting Batteries
    iv. Using Emergency Power-down Controls
    v. Understanding the UPS System Operation
    vi. Operational Controls and Features
    vii. Using the Control Panel
    viii. UPS System Operating Instructions
    ix. Using Features and Options
    x. Responding to System Events
    xi. Communications
    xii. Remote Notification
    xiii. Maintaining the UPS System
    xiv. All Other Product Specifications

**14) <u>BASIC SYSTEM CHARACTERISTICS</u>**

a. System Capacity: The system shall be rated for full kW output in the following frame sizes:
    i. 40 kVA/kW, can be configured with up to five 10 kW power modules for N+1.
b. Input:
    i. AC Input Nominal Voltage: 208 volts three-phase, 4 wires, 60 hertz.
    ii. AC Input Voltage Window: ±15 percent of nominal (while providing nominal charging to the battery system).
    iii. Short Circuit Withstand Rating: 30,000 symmetrical amperes.
    iv. Maximum Frequency Range: 40 hertz to 70 hertz.
    v. Input Power Factor:
        1. Greater than 0.96 at 50 percent load.
        2. Greater than 0.99 at 100 percent load.
    vi. Input Current Distortion With No Additional Filters:
        1. Less than 6 percent at 100 percent load.
        2. Less than 6 percent at 50 percent load.

vii. Soft Start: Shall be linear from 0 percent to 100 percent input current and shall not exhibit inrush. This shall take place over a 15 second time period.

c. UPS Output:
   i. AC Output Nominal Output: 208 volts, three-phase, 4 wires, 60 hertz.
   ii. AC Output Voltage Distortion: Maximum 3 percent at 100 percent linear load.
   iii. AC Output Voltage Regulation: ±1 percent for 100 percent linear or non-linear load.
   iv. Voltage Transient Response: ±5 percent maximum for 100 percent load step.
   v. Voltage Transient Recovery: Within less than 60 milliseconds.
   vi. Output Voltage Harmonic Distortion:
      1. Less than 2 percent THD maximum and 1 percent single harmonic for a 100 percent linear load.
      2. Less than 5 percent THD maximum for a 100 percent non-linear load.

d. Overload Rating:
   i. Normal Operation:
      1. 150 percent for 30 seconds.
      2. Up to 105 percent.
   ii. Bypass Operation:
      1. 100 percent continuous.
      2. 1000 percent for 500 milliseconds.

e. System AC-AC Efficiency: Greater than 94% from 50% to 100% load in double- conversion mode. ENERGY STAR qualified.

f. Output Power Factor Rating: The UPS output shall not require derating for purely resistive loads (PF of 1). The output kW and kVA ratings of the UPS output shall be equal. For loads exhibiting a power factor of 0.9 leading to 0.8 lagging, no derating of the UPS shall be required.

**15) <u>PRODUCTS</u>**

a. MANUFACTURERS
   i. Basis of Design: Product specified is “APC InfraStruXure for Medium Data Centers, 40 kW Base Building Block; 10 kW - 40 kW UPS” as manufactured by Schneider Electric. Items specified are to establish a standard of quality for design, function, materials, and appearance. Equivalent products by other manufacturers are acceptable. The County will be the sole judge of the basis of what is equivalent.

b. UPS MODES OF OPERATION
   i. Normal: The input converter and output inverter shall operate in an on-line manner to continuously regulate power to the critical load. The input and output converters shall be capable of full battery recharge while simultaneously providing regulated power to the load for all line and load conditions within the range of the UPS specifications.
   ii. Battery: Upon failure of the AC input source, the critical load shall continue being supplied by the output inverter, which shall derive its power from the battery system. There shall be no interruption in power to the critical load during both transfers to battery operation and retransfers from battery to normal operation.
   iii. Recharge: Upon restoration of the AC input source, the input converter and output inverter shall simultaneously recharge the battery and provide regulated power to the critical load.

iv. Static Bypass: The static bypass shall be used to provide transfer of critical load from the inverter output to the bypass source. This transfer, along with its retransfer, shall take place with no power interruption to the critical load. In the event of an emergency, this transfer shall be an automatic function.

v. Maintenance Bypass: The system shall be equipped with an external make-before-break maintenance bypass enclosure to electrically isolate the UPS during routine maintenance and service of the UPS. The maintenance bypass enclosure shall completely isolate both the UPS input and output connections.

c. INPUT POWER CONVERTER

i. General: The input power converters of the system shall be housed within the parallel connected, removable power modules, and shall constantly control the power imported from the mains input of the system, to provide the necessary UPS power for precise regulation of the DC bus voltage, battery charging, and main inverter regulated output power.

ii. Input Current Total Harmonic Distortion: The input current THDI shall be held to 6 percent or less at full system, while providing conditioned power to the critical load bus, and charging the batteries under steady state operating conditions. This shall be true while supporting loads of both a linear or non-linear type. This shall be accomplished with no additional filters, magnetic devices, or other components.

iii. Soft Start Operation: As a standard feature, the UPS shall contain soft start functionality, capable of limiting the input current from 0 percent to 100 percent of the nominal input over a default 15 second period, when returning to the AC utility source from battery operation. The change in current over the change in time shall take place in a linear manner throughout the entire operation (di/dt = constant).

d. Magnetization Inrush Current: The UPS shall exhibit 0 inrush current as a standard product. If provided with an optional isolation transformer or PDU/system bypass, system inrush shall be limited to six times the nominal input current of the transformer.

e. Input Current Limit:

i. The input converter shall control and limit the input current draw from utility to 150 percent of the UPS output. During conditions where input current limit is active, the UPS shall be able to support 100 percent load, charge batteries at 10 percent of the UPS output rating, and provide voltage regulation with mains deviation of up to ±15 percent of the nominal input voltage.

ii. In cases where the source voltage to the UPS is nominal and the applied UPS load is equal to or less than 100 percent of UPS capacity, input current shall not exceed 126 percent of UPS output current, while providing full battery recharge power and importing necessary power for system losses.

f. Redundancy: The UPS shall be configured with redundant input converters, each with semiconductor fusing, and logic-controlled contactors to remove a failed module from the input bus.

g. Charging:

i. The battery charging shall keep the DC bus float voltage of ±220 volts, ±1 percent.

ii. The battery charging circuit shall contain a temperature compensation circuit, which shall regulate the battery charging to optimize battery life.

iii. The battery charging circuit shall remain active when in static bypass and in normal operation.

h. Back-Feed Protection: The above mentioned logic-controlled contactor shall also provide the back-feed protection required by UL 1778.

**16) <u>OUTPUT INVERTER</u>**

a. General: The UPS output inverter shall constantly recreate the UPS output voltage waveform by converting the DC bus voltage to AC voltage through a set of IGBT driven power converters. In both normal operation and battery operation, the output inverters shall create an output voltage independent of the mains input voltage. Input voltage anomalies such as brown-outs, spikes, surges, sags, and outages shall not affect the amplitude or sinusoidal nature of the recreated output voltage sine wave delivered by the output inverters.
b. Overload Capability: The output power converters shall be capable of 300 percent for short circuit clearing. Steady state overload conditions, of up to 150 percent of system capacity shall be sustained by the inverter for 30 seconds in normal and battery operation. Should overloads persist past the outlined time limitation the critical load shall be switched to the automatic static bypass output of the UPS.
c. Output Contactor: The output inverter shall be provided with an output mechanical contactor to provide physical isolation of the inverter from the critical bus. With this feature a failed inverter shall be isolated from the critical bus.
d. Battery Protection: The inverter shall be provided with monitoring and control circuits to limit the level of discharge on the battery system.
e. Redundancy: The UPS shall be configured with redundant output inverters, each with semiconductor fusing, and logic-controlled contactors to remove a failed component from the input, DC, and output critical bus.

**17) <u>STATIC BYPASS</u>**

a. General: As part of the UPS, a system static bypass cabinet shall be provided. The system static bypass shall provide no break transfer of the critical load from the inverter output to the static bypass input source during times where maintenance is required, or the inverter cannot support the critical bus. Such times may be due to prolonged or severe overloads, or UPS failure. The UPS and static bypass switch shall constantly monitor the auxiliary contacts of their respective circuit breakers, as well as the bypass source voltage, and inhibit potentially unsuccessful transfers to static bypass from taking place.
b. Design: The design of the static switch power path shall consist of silicon-controlled rectifiers (SCR) with a continuous duty rating of 125 percent of the UPS output rating.
c. Automatic Transfers: An automatic transfer of load to static bypass shall take place whenever the load on the critical bus exceeds the overload rating of the UPS. Automatic transfers of the critical load from static bypass back to normal operation shall take place when the overload condition is removed from the critical output bus of the system. Automatic transfers of load to static bypass shall also take place if for any reason the UPS cannot support the critical bus.
d. Manual Transfers: Manually initiated transfers to and from static bypass shall be initiated through the UPS display interface.
e. Overloads: The static bypass shall be rated and capable of handling overloads equal to or less than 125 percent of the rated system output continuously. For instantaneous overloads caused by inrush current from magnetic devices, or short circuit conditions, the static bypass shall be capable of sustaining overloads of 1000 percent of system capacity for periods of up to 500 milliseconds.
f. Modular: The static bypass switch shall be of a modular design.

g. System Protection: As a requirement of UL 1778, back-feed protection in the static bypass circuit shall also be incorporated in the system design. To achieve back-feed protection, a mechanical contactor in series with the bypass SCR(s) shall be controlled by the UPS/static switch, to open immediately upon sensing a condition where back-feeding of the static switch by any source connected to the critical output bus of the system is occurring. One such condition could be a result of a shorted SCR.

**18) <u>DISPLAY AND CONTROLS</u>**

a. Control Logic: The UPS shall be controlled by two fully redundant, swappable control modules. These modules shall have separate, optically isolated, communication paths to the power and static switch modules. Logic power for the control modules shall be derived from redundant power supplies, each having a separate AC and DC input and output. The communication of the control modules shall be of controller area network (CAN Bus).
b. Display Unit: A microprocessor-controlled display unit shall be located on a hinged door in the front of the system. The display shall consist of an alphanumeric display with backlight, an alarm LED, and a keypad consisting of pushbutton switches.
c. Metered Data: The following metered data shall be available on the alphanumeric display:
    i. Year, month, day, hour, minute, second of occurring events.
    ii. Source input voltage.
    iii. Output AC voltage.
    iv. Output AC current.
    v. Input frequency.
    vi. Battery voltage.
    vii. Internal battery temperature.
d. Event Log: The display unit shall allow the County to display a time and date stamped log of the 64 most recent status and alarm events.
e. Alarms: The display unit shall allow the County to display a log of active alarms. The following minimum set of alarm conditions shall be available:
    i. Input frequency outside configured range.
    ii. AC adequate for UPS but not for bypass.
    iii. Low/no AC input, startup on battery.
    iv. Intelligence module inserted.
    v. Intelligence module removed.
    vi. Redundant intelligence module inserted.
    vii. Redundant intelligence module removed.
    viii. Number of batteries changed since last on.
    ix. Number of power modules changed since last on.
    x. Number of batteries increased.
    xi. Number of batteries decreased.
    xii. Number of power modules increased.
    xiii. Number of power modules decreased.
    xiv. Number of external battery cabinets increased.
    xv. Number of external battery cabinets decreased.
    xvi. Redundancy restored.
    xvii. Need battery replacement.
    xviii. Redundant intelligence module is in control.
    xix. UPS fault.

xx. On battery.
xxi. Shutdown or unable to transfer to battery due to overload.
xxii. Load shutdown from bypass. Input frequency volts outside limits.
xxiii. Fault, internal temperature exceeded system normal limits.
xxiv. Input circuit breaker open.
xxv. Bad battery module.
xxvi. Bad power module.
xxvii. Intelligence module is installed and failed.
xxviii. Redundant intelligence module is installed and failed.
xxix. Redundancy has been lost.
xxx. Redundancy is below alarm threshold.
xxxi. Runtime is below alarm threshold.
xxxii. Load is above alarm threshold.
xxxiii. Load is no longer above alarm threshold.
xxxiv. Minimum runtime restored.
xxxv. Bypass is not in range (either frequency or voltage).
xxxvi. UPS in bypass due to internal fault.
xxxvii. UPS in bypass due to overload.
xxxviii. System in forced bypass.
xxxix. Fault, bypass relay malfunction.
xl. Q001 open/closed.
xli. Q002 open/closed.
xlii. Q003 open/closed.
xliii. High DC warning.
xliv. High DC shutdown.
xlv. Low battery shutdown.
xlvi. Low battery warning.

f. Controls: The following controls or programming functions shall be accomplished by the use of the display unit. Pushbutton membrane switches shall facilitate these operations:
   i. Silence audible alarm.
   ii. Set the alphanumeric display language.
   iii. Display or set the date and time.
   iv. Enable or disable the automatic restart feature.
   v. Transfer critical load to and from static bypass.
   vi. Test battery condition on demand.
   vii. Set intervals for automatic battery tests.
   viii. Adjust set points for different alarms.
   ix. Program the parameters for remote shutdown.
g. Potential Free (Dry) Contacts: The following potential free contacts shall be available on an optional relay interface board:
   i. Normal operation.
   ii. Battery operation.
   iii. Bypass operation.
   iv. Common fault.
   v. Low battery.
   vi. UPS off.

h. Communication Interface Board: A communication interface board shall provide the following communication ports which can be used simultaneously:
    i. RS-232 serial port #1.
    ii. RJ-45 interface port for a remote display.

**19) <u>BATTERY</u>**

a. The UPS battery shall be of modular construction made up of swappable, fused, battery modules.
b. Each battery module shall be monitored for voltage and temperature for use by the UPS battery diagnostic, and temperature compensated charger circuitry.
c. The battery jars housed within each removable battery module shall be of the valve regulated lead acid (VRLA) type.
d. The UPS shall incorporate a battery management system to continuously monitor the health of each removable battery module. This system shall notify the County in the event that a failed or weak battery module is found.
e. As a standard product offering, the UPS shall be capable of delivering 10 minutes of back-up (at 40 kW) with battery cartridges located internal to the UPS. This option shall not cause any increase to the UPS footprint.

**20) <u>ACCESSORIES</u>**

a. Battery Disconnect Breaker: Each UPS system shall have a 250 volt DC rated, thermal magnetic trip molded case circuit breaker. Each circuit breaker shall be equipped shunt trip mechanisms and 1A/1B auxiliary contacts. The circuit breakers shall be located within the UPS cabinet or as part of a line-up-and-match type battery cabinet.
b. PDU/System Bypass:
    i. The PDU/system bypass cabinet shall provide power to the critical load from the bypass source, during times where maintenance or service of the UPS is required. The PDU/system bypass shall provide a mechanical means of complete isolation of the UPS from the critical output distribution. The PDU/system bypass shall be constructed in a standard 24 inch (610 mm) wide 36 inch (914 mm) deep, 42U High, IT rack style cabinet.
    ii. As a minimum, the PDU/system bypass shall contain the following features and accessories:
        1. Appropriately rated circuit breakers to fully isolate the UPS during times where maintenance is required. As a part of this design there shall be a UPS input circuit breaker designated as Q1, a UPS output circuit breaker designated as Q2, and a wrap-around maintenance bypass circuit breaker designated as Q3. For PDU/system bypass panels equipped with an input transformer, there shall also be a molded case switch to isolate the transformer primary windings from the mains input to the system. Minimum 1A/1B auxiliary contacts for the purpose of relaying status information of each circuit breaker/switch actuator to the UPS and PDU/system bypass shall be provided, along with a means of locking out the circuit breakers to inhibit operation of the bypass transfer pair. The PDU/system bypass shall be available for a 208 volt, 480 volt, or 600 volt input.
        2. Also included in the PDU/system bypass shall be two 42 pole distribution panelboards connected to the output bus of the PDU/system bypass to serve as critical load distribution.

3. For purposes of providing local annunciation of status and alarm messages, the PDU/system bypass shall have an alphanumeric display with pushbutton switches, allowing retrieval of active alarms, system level programming, and event history of the PDU/system bypass. For purposes of simplicity and ease of use, the PDU/system bypass display shall be identical in nature to that of the Symmetra PX 40 kW UPS.
4. The PDU/system bypass shall also have a full length hinged front door, with locking mechanism; to allow access to the two 42 pole panelboard circuit breakers and three breaker type maintenance bypass circuit breakers. There shall also be a hinged rear door to allow access to the main input circuit breaker.
5. The PDU/system bypass shall bear a full mimic diagram inside the hinged front door. Also associated with the mimic panel shall be indicating lights, capable of depicting proper operation of maintenance bypass circuit breaker and UPS output circuit breaker.

iii. The following minimum options shall also be available for the PDU/system bypass:
1. For ease of load bank testing the system, a pin-and-sleeve cam lock type load bank test port shall be available to allow use of a portable load bank to be connected to the system, without having to remove deadfronts or gain access to live bus work or circuit breakers. A load bank shall be available with a properly configured connector on flexible cord to facilitate ease of use.
2. Each pole of each circuit breaker shall be monitored, and report the load current drawn on each circuit breaker pole to a common infrastructure management system. Values metered by branch circuit monitoring shall be available through a web-based browsing system and shall be incorporated into the same monitoring system as the other components within this Section.

c. Modular Battery Solutions: For purposes of providing extended UPS back-up power, modular battery cabinets shall be available. For ease of maintenance the modular battery cabinet shall house draw-out battery cartridges. These cartridges shall conform to OSHA lifting requirements for one person to replace battery cartridges without lifting tools or additional mechanisms. Battery cartridges shall interlock in place within the battery cabinet to ensure proper contact. When withdrawing a battery cartridge, a catch shall stop the battery cartridge from inadvertently being withdrawn in an unsafe manner. The modular battery solution shall be housed in a standard, 24 inch (610 mm) wide, 36 inch (914 mm) deep, 42U high equipment racks. Up to four modular battery cabinets may be added for increased battery runtime.
d. Rack Mount Power Distribution Units: For purposes of distributing power within an IT cabinet, rack mount power distribution units shall be available for installation within the IT cabinet. The rack mount power distribution units shall be capable of being installed in the back of the accompanying cabinet to consume zero U-space in the front of the rack, and shall not require tools for installation within the rack.
i. Input Connection: For ease of installation, the rack mount PDU shall be connected via a twist lock connecter, and shall be capable of being fed from agency-approved flexible corded distribution wiring as described elsewhere in this Section. The input

shall be capable of being served by 208Y120 volts from an L21-20 Type NEMA connector.

1. A hard-wired version of the product shall also be available as an option and shall be capable of being fed from a three-pole 20 ampere circuit breaker.

ii. Output Connections: The output of the rack mount PDU shall be fed from 208Y120 volts, and shall be distributed to receptacles capable of supplying power to cord-connected equipment. Assuming rack mount PDU is fed from a circuit breaker with an 80 percent continuous rating, a single rack mount PDU shall be capable of distributing up to 5.7 kW in a single rack.

iii. Options:

1. Phase Metering: The current of each input phase of the rack mount PDU shall be monitored, displayed locally on an illuminated seven segment display, and reported through a built-in web/SNMP interface.
2. Outlet Management: The outlets of the rack mount PDU shall have managed switched capability as an option. The current of each input phase of the rack mount PDU shall be monitored, displayed locally on an illuminated seven segment display, and reported through a built-in web/SNMP interface. The web/SNMP interface shall also be used to manage and control the outlet receptacles.

e. Overhead Distribution:

i. Flexible Distribution Conductors: For purposes of overhead distribution wiring of data center branch circuits, flexible conductors of either an SJO type, or TC type shall be available as a distribution means. Flexible conductors shall be equipped with NEMA or IEC style cord caps and shall be agency-approved under UL 60950 as part of the system.

ii. Cable Ladder: For purposes of routing data and power cables between rows in a data center aisle layout, cable ladders shall be available to span the gap between rows. Cable ladders shall be agency-approved under UL 60950 as part of the system. The use of overhead cable management shall minimize the need to run data and power cable beneath a raised floor, thus minimizing potential air flow obstructions for down-flow type precision cooling solutions. This means of cable management shall also facilitate ease of installation of power and data cabling in data centers not utilizing raised floor. Optional covers shall be available for ladders as a means of adhering to local codes requiring such.

iii. Cable Trough: For purposes of routing data and power cable along the length of a row of IT cabinets in a data center environment, cable troughs shall be available as a means of separating and housing data and power cable. Optional covers shall be available for troughs as a means of adhering to local codes requiring such. The use of overhead cable management shall minimize the need to run data and power cable beneath a raised floor, thus minimizing potential air flow obstructions for down-flow type precision cooling solutions. This means of cable management shall also facilitate ease of installation of power and data cabling in data centers not utilizing raised floor.

f. Remote Power Panel (RPP): For purposes of wiring convenience, remote power panels (RPP) shall be available to take a single feed from the PDU/system bypass output, and distribute

power to the critical load. A total of two 42 pole panelboards shall be housed in the RPP to distribute a combination of single-phase and three-phase load equipment.

i. Branch Circuit Monitoring: Branch circuit monitoring shall be available as outlined elsewhere in this Section.
ii. System Manager: RPP shall be fully compatible with system manager, management system as outlined elsewhere in this Section.

g. Floor Anchor Brackets: Floor anchor brackets shall be available to solidly connect UPS, PDU/system bypass, and battery cabinet to minimize unintended moving of the equipment.
h. Software and Connectivity:
    i. Network Adaptor: The Network Management Card shall allow one or more network management systems (NMS) to monitor and manage the UPS in TCP/IP network environments. The SNMP interface adaptor shall be connected to the UPS via Ethernet Port.
    ii. Network Adaptor desired features:
        a. Access to the SNMP card shall be available on HTTP, HTTPS, FTP, TELNET, local serial console, and SNMP.
        b. First landing page of the http/s server shall be configurable to be the “status” page, with the temperature units being switchable between Fahrenheit and Celsius.
        c. Ability to control the UPS by rebooting the UPS, turning the UPS off, or putting the UPS to sleep (as applicable) via the SNMP card.
        d. Ability to remotely disconnect any management sessions via the SNMP card.
        e. Ability to reset/reboot the SNMP card remotely.
        f. Ability to perform scheduled shutdown on a daily or weekly basis.
        g. Ability to change power settings by changing the high and low transfer voltages, rated output voltage, and sensitivity to power transients.
        h. Ability to change shutdown parameters, such as low battery duration, shutdown delay, duration of shutdown, and end of shutdown.
        i. Ability to log in the SNMP card the date of last battery replacement, type of power loss alarm, and number of external batteries, if present.
        j. Ability to synchronize the SNMP card’s system time with an NTP server of our choice. SNTP will not be acceptable if it is offered instead of full NTP operation.
        k. Ability to have the calendar auto-adjust to accommodate traditional Daylight Savings Time or on a custom calendar as needed.
        l. Generation of SYSLOG messages and directing them to an external third-party SYSLOG server.
        m. Generation of email notifications, to an arbitrary number of individuals and/or distribution groups, detailing system status, self-check results, system errors, and such.

i. These emails shall be configurable so that certain events and/or errors can be assigned greater severity than others, on a per-email recipient basis.

n. Email parameters shall be configurable to accommodate a wide range of email servers, including Microsoft Exchange, as well as username and password if needed.
o. Email parameters shall be available to use SSL/TLS if needed.
p. Ability to use SNMPv1 and/or SNMPv3 at the same time or separately as needed.
q. Ability to generate SNMP traps and send them to an external third party SNMP trap handler.
r. Ability to launch UPS alarm self-test, UPS battery and charging circuitry self-test, or a runtime calibration.
s. Periodic configurable battery self-test.
t. Monitoring of system temperature and/or humidity.
u. Generation and retention of system logs and voltage measurements directly on the management card.
    i. The logs are to be downloadable, and the format of the logs shall be user-configurable between tab-delimited and CSV.
v. Management of multiple user accounts with varying degrees of device access on the SNMP card.
w. Ability to select a strong password and mandatory password changes, on a per-user or all-user basis.
x. Ability to set user access centrally using a third-party RADIUS server.
y. Ability to change the user interface language from English with the download of a multi-language firmware image.
z. Packet-level firewall to restrict access to the SNMP card to certain IP addresses and/or subnets.
aa. At least once-yearly firmware updates available for the SNMP card from the manufacturer for the supported life of the card, as determined by the manufacturer.
bb. Ability to integrate into APC/Schneider PowerChute software running on multiple servers if needed.

iii. Unattended Shutdown:
    1. The UPS, in conjunction with a network interface card, shall be capable of gracefully shutting down one or more operating systems.

i. Remote System Monitoring: The following three methods of remote UPS monitoring shall be available:
    i. Web Monitoring: Remote monitoring shall be available via a web browser such as Internet Explorer.
    ii. RS-232 Monitoring: Remote UPS monitoring shall be possible via either RS-232 or contact closure signals from the UPS.
    iii. Simple Network Management Protocol (SNMP): Remote UPS monitoring shall be possible through a standard MIB II compliant platform.

21) **SOFTWARE COMPATIBILITY**

a. The UPS manufacturer shall have available software to support graceful shutdown and remote monitoring with PowerChute Network Shutdown (PCNS) for the following operating system families for:
    i. Windows
    ii. Hyper-V
    iii. VMware
    iv. Linux
    v. Unix
    vi. Mac OS X
    vii. The full and updated supported OS compatibility chart can be found here: http://www.apc.com/whitepaper/?um=200
b. StruxureWare Data Center Expert: A centralized infrastructure management platform hereafter referred to as Data Center Expert shall be available for purposes of complete system monitoring and management of all components outlined in this specification used as a single solution for small IT or part of the StruxureWare software stack providing data to systems such as Data Center Operation.
    i. Monitoring - Data Center Expert shall be capable of monitoring a PDU through a network of Cat 5 cable and a switch supplied by the user. This switch shall relay information to Data Center Expert, which in turn shall allow access to this information via the user's public network via a single IP address.
    ii. Monitored Values: Data Center Expert shall be capable of monitoring alarms, general status parameters, voltage and current of the PDU.
    iii. Thresholds: For individualized customer needs, Data Center Expert shall allow for user configurable thresholds for alarm notification. With this feature, Data Center Expert can notify clients of reaching thresholds for PDU capacity, or branch circuit breaker capacity. Other custom programmable alarm points for non-Schneider Electric products shall also be available via dry contact input signal.
    iv. Public Network Monitoring: Data Center Expert shall also be capable of monitoring other Schneider Electric devices that are connected to the client's public network.

**22) <u>REFERENCES</u>**

a. General: The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only. The edition/revision of the referenced publications shall be the latest date as of the date of the Contract Documents, unless otherwise specified.
    i. Electronic Industries Association (EIA):
    ii. EIA 310, "Racks, Panels, and Associated Equipment" (copyrighted by EIA, ANSI approved).
b. Institute of Electrical and Electronics Engineers, Inc. (IEEE):
    i. ANSI/IEEE 519, "Guide for Harmonic Control and Reactive Compensation of Static Power Converters" (copyrighted by IEEE, ANSI approved).
c. International Organization for Standardization (ISO):
    i. ISO 9001, "Quality Management Systems - Requirements."
    ii. ISO 14001, "Environmental Management Systems - Requirements with Guidance for Use."
d. Underwriters Laboratories, Inc. (UL):
    i. UL 891, "Standard for Dead-Front Switchboards" (copyrighted by UL, ANSI approved).

ii. UL 1778, "Standard for Uninterruptible Power Supply Equipment" (copyrighted by UL, ANSI approved).
iii. UL 60950, “Standard for Information Technology Equipment.”

**END OF STATEMENT OF WORK/SPECIFICATION**

## PROPOSAL PRICING

PLEASE SUBMIT WITH YOUR PROPOSAL THE FOLLOWING:

1. AN ITEMIZED PRICING GUIDE OF ALL ESSENTIAL COMPONENTS- THIS SHOULD AT A MINIMUM INCLUDE THE COST OF THE UPS MODEL, THE COST OF THE BATTERIES
2. COST OF ON-SITE INSTALLATION
3. OPTIONAL MAINTENANCE (1 YEAR, 3 YEAR, AND 5 YEAR)