

**PASQUOTANK — CAMDEN — ELIZABETH CITY
CENTRAL COMMUNICATIONS CENTER**



**Request for Proposals
VHF Simulcast Paging System**

Issued April 19, 2017

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1. PROJECT OVERVIEW

1.1 INTRODUCTION

Pasquotank County, North Carolina (County) invites Vendors to respond with a proposal to address the turnkey enhancement of the County's very high frequency (VHF) paging system. The desired system shall be configured as a complete, single radio frequency (RF) site, simulcast paging system that will enable two dispatch centers to provide tone-and-voice paging services.

This procurement is for paging infrastructure—terminals, transmitters, simulcast timing equipment, backhaul interface, and antenna systems—and installation. The system will interface directly with the County's dispatch operator positions at the consolidated Camden County and Pasquotank County dispatch center, and the backup dispatch operator center at Martin County.

Through this replacement system, the County will improve public safety to the citizens and first responders by:

- Dramatically increasing paging coverage throughout the jurisdictional boundaries of Pasquotank and Camden counties
- Increasing redundancies and improving the overall reliability of the alerting network

The County recognizes that this project and the associated infrastructure are significant in scope and complexity, and is seeking respondents that can deliver a highly cost-effective solution.

1.2 BACKGROUND

The County presently operates a single-site VHF tone-and-voice paging system. The current system infrastructure is based on a Motorola GTR 8000 base station used in analog mode. Connectivity currently is provided on the existing system by County-provided T1 lines and channel banks.

Dispatching is handled at the Pasquotank-Camden E-911 Central Communications Center. There are five Motorola MCC 7500 dispatch consoles that interface with the current analog paging system via a Motorola conventional channel gateway (CCGW).

A single transmit site located near Elizabeth City currently is used for the paging system. The County's responders currently are alerted from a single, wideband GTR 8000 VHF transmitter. The County desires for the new system to be simulcast from three locations; the current location and two other locations (South Mills and Wades Point).

1.3 OVERVIEW

- A. The project includes the turnkey upgrade of the County's paging system

- B. The system must operate in the simulcast mode utilizing the following three existing tower sites: County Main (current transmit site), South Mills, and Wades Point
- C. The system must interface to MCC 7500 dispatch consoles currently being used
- D. The system must utilize existing Ethernet backhaul
- E. The system must allow for a redundant paging input from another operator console system. The County currently plans to build a backup console operator site in Martin County to provide for redundant paging to the paging system described in this RFP.

1.4 DOCUMENT OVERVIEW

- A. This section provides a high-level overview of all sections of this specifications document.
 - 1. Section 1, Project Overview—Provides background information and a general overview of the requirements contained in this specifications document
 - 2. Section 2, Instructions to Vendor—Provides instructions to Vendors regarding the proposal
 - 3. Section 3, Tone-and-Voice Paging—Provides requirements for the tone-and-voice paging subsystem
 - 4. Section 4, Warranty, Maintenance, and Support—Provides requirements for the warranty, extended warranty, maintenance, and support of the proposed system and subsystems
 - 5. Section 5, System Implementation, Testing, and Acceptance—Provides requirements for test plans, factory staging, system cutover, installation, coverage testing, and final acceptance

1.5 PROJECT SUMMARY

- A. Vendor shall be responsible for the following project components:
 - 1. Furnishing and installing system equipment and ancillary system elements
 - 2. Engineering and system design
 - 3. Project management for the components proposed
 - 4. Software

5. Acceptance testing
 6. Cutover plan and 30-day test plan
 7. Warranty and maintenance
- B. Vendor shall be responsible for furnishing complete and fully functional system without loss of functionality to the existing system
 - C. Work shall be planned, coordinated, and conducted with minimal interruption of service to existing critical systems
 - D. All proposed equipment and systems shall be provided in new condition and be covered by a full factory and/or manufacturer's warranty of not less than one year
 - E. Proposals shall not be accepted that include systems or equipment near the end of their respective lifecycles
 - F. If requirements are stated in more than one section and appear to conflict, the more-stringent requirement shall apply

1.6 PROPOSALS REQUIRED

- A. Vendors must register their interest in submitting a proposal by sending an e-mail to Sheriff Randy Cartwright (cartwrightr@co.pasquotank.nc.us) by no later than Friday, May 12th, 2017. Submission of a base offering proposal is required. Respondents shall submit four (4) hard copies and four (4) electronic copies in Universal Serial Bus (USB) format to the County. Sealed proposals will be received until 3:00 p.m. on Thursday, May 25th, 2017 at which time they will be opened and publicly read aloud. Proposals should be submitted to:

County Managers Office
Pasquotank County Courthouse
206 E. Main Street
Elizabeth City, NC 27909

There will not be a mandatory pre-bid meeting. If Vendors have questions regarding the proposal, questions can be submitted in writing and a telephone conference can be scheduled with the County's Consultants, Mission Critical Partners, Inc. (MCP). Questions should be submitted in writing to Sheriff Randy Cartwright (cartwrightr@co.pasquotank.nc.us), no later than Friday, May 12th, 2017.

B. Alternate Proposals:

1. If a Vendor has a technological solution that does not meet the exact requirements in this specifications document, a Vendor may offer more than one proposal, as long as each proposal fully addresses the intent of the requirements set forth in this document. Any alternate proposals must be offered in addition to the base proposal, not in lieu of.
2. Alternate proposals shall be submitted separately under a different cover from the base proposal and be clearly marked "ALTERNATE PROPOSAL"
3. The Vendor shall comply with the same submittal instructions in Section 2.1, Proposal Format

1.7 QUALITY ASSURANCE AND COORDINATION

1.7.1 *Standards and Guidelines*

- A. The Vendor shall comply with applicable standards, rules, regulations, and industry guidelines
- B. The Vendor shall comply with industry best practices for system installation, grounding, bonding, and transient voltage surge suppression (TVSS), as outlined in the following standards:
 1. Motorola R56®, *Standards and Guidelines for Communication Sites* (latest revision)
 2. Harris AEA-123 4618/1, *Grounding Guidelines* (latest revision)
- C. If there are deficiencies in grounding at the site, Vendor will provide a scope of work and cost estimate to make the entire site compliant
- D. If the requirements of this specifications document conflict with applicable standards, rules, regulations, or industry guidelines, then the more stringent shall become applicable
- E. The Vendor shall identify and coordinate all necessary codes, permitting, etc., including building permits. The Vendor shall notify the County of any issues
- F. The Vendor shall be responsible for performing a structural analysis for each tower when loading will be modified, and for advising the County where remediation will be required
- G. For the State-owned tower at South Mills, the structural analysis will need to be completed by the State-designated structural engineering provider, Tower Engineering Professionals (TEP). Structural analysis for this site will need to be coordinated with the State's Construction

Manager. Joe Allison currently is acting in this capacity. The Vendor also shall complete a power consumption study for the paging system equipment being installed at this site.

1.7.2 Frequency Coordination and Licensing

A. Land Mobile Radio (LMR) Licenses:

1. The existing paging system operates on a single-site VHF frequency that will need licensing for the other two sites. Vendor will coordinate with the local regional frequency coordinator and complete the documentation to add the two new locations to the current Federal Communications Commission (FCC) license.

1.7.3 Project Management

- A. The successful Vendor shall provide a Project Management Plan (PMP) that includes project scope, deliverables, schedule, quality assurance/quality control (QA/QC) processes, and risk management sections. PMPs that are clear and concise are desired.
- B. Regularly scheduled status meetings shall be established between the County Project Team and the successful Vendor. The Vendor shall provide a schedule for these meetings subject to the County's approval.

1.7.3.1 Scheduling

The successful Vendor shall develop and maintain a project schedule including tasks, milestones, start and end dates, task predecessors, and task owners in Microsoft Project format. These items are especially important because the Vendor will be working on the same operational paging channel used by the current system.

- A. The schedule shall represent tasks associated with completing work. The project schedule shall be updated with actual dates as tasks are completed.
- B. The updated schedule shall be provided as an agenda item for all County/Vendor status meetings.
- C. The schedule shall address the following, at a minimum:
 2. Site surveys
 3. Detailed design review
 4. Required site modification

5. Required shelter modification
6. Equipment ordering
7. Equipment delivery
8. System installation
9. System configuration
10. System optimization
11. Acceptance testing
12. Coverage testing
13. System cutover
14. System documentation development and delivery

1.7.3.2 Project Punch List

- A. The successful Vendor shall establish and maintain a punch list for project-related critical path issues, and for items where action/resolution of issues is pending
- B. The punch list shall be maintained in real time, updated and published weekly. The punch list shall include the following, at a minimum:
 1. Sequential punch-list item numbers
 2. Date identified
 3. Item description
 4. Party responsible for resolution
 5. Expected resolution date
 6. Resolution date
 7. Details about how each punch-list item is being resolved (status)

If responsibility for resolving an item is transferred to another person or group, the punch-list item shall be appropriately noted.

The Vendor shall be responsible for reviewing each punch-list item and advising the County of any changes. The status of punch-list items shall be discussed during each status meeting.

1.7.3.3 Project Meetings

- A. A project kickoff meeting shall be scheduled prior to the beginning of the project
- B. Regular project status meetings shall be scheduled following contract award and the initial kickoff meeting. Schedule to be mutually determined
- C. The successful Vendor shall be responsible for scheduling the meetings as well as preparing meeting agendas and minutes. In addition to those items identified in Section 1.7.3.1 above, meeting agenda items shall include, at a minimum, the following discussion items. Discussion items may be combined for efficiency:
 - 1. Schedule review
 - 2. Status of deliverables
 - 3. Risk items
 - 4. Changes
 - 5. Plans for the next period
 - 6. Action-item assignments
 - 7. Punch-list review

1.7.3.4 Project Staffing

- A. Project staffing shall be managed by the successful Vendor based on workload and the level of effort throughout the implementation/installation process; however, the positions identified below shall be staffed throughout the duration of the project and shall not be changed without prior approval of the County.
- B. Vendor's Project Manager:
 - 1. Vendor's Project Manager shall be the primary point of contact (POC) between the County and the Vendor

2. Vendor's Project Manager shall:
 - a. Bear full responsibility for supervising and coordinating the installation and deployment of the communications system
 - b. Be responsible for development and acceptance of the implementation plan
 - c. Manage the execution of the project against that plan
 - d. Oversee the day-to-day project activities, deliverables, and milestones completion
3. Vendor's Project Manager shall be responsible for coordination of the regular status meetings

C. Vendor's Project Engineer/Technical Lead:

1. Vendor's Project Engineer/Technical Lead shall have the primary responsibility for managing the system design and ensuring that the system is installed in accordance with the approved system design
2. Any deviation from the system design shall be subject to project change control procedures and will not be undertaken until approved by the County
3. Vendor's Project Engineer/Technical Lead shall ensure the development of block diagrams, system-level diagrams, and rack diagrams to assist the installation team in completing the system installation
4. The Vendor's Project Engineer/Technical Lead also shall supervise the development and execution of the System Acceptance Test Plan (SATP) and the Coverage Acceptance Test Plan (CATP), and guide the County Project Team through the processes and procedures necessary to prove that the system performs as specified in the contract. No test plan will be executed until approved by the County.

1.8 PROJECT SUBMITTALS

Key project deliverables and submittals are outlined on the following page and are described in further detail throughout this specifications document.

- A. All project submittals shall be subject to review and approval by the County and its Consultant
- B. All submittals shall be provided in hard copy, properly bound, and in electronic format on a USB flash drive. Soft copy files shall be provided in readily accessible formats, including .pdf, .doc,

.xls, and .ppt. Three (3) hard copies are required for each type of submittal unless otherwise determined by the County prior to submission.

- C. All submittals shall include a cover letter or letter of transmittal, signed, dated, and fully describing the contents of the submittal.

1.8.1 Preliminary Design (30 days after contract award)

- A. The successful Vendor shall submit the Preliminary Design package in their native editable format and Portable Document Format (PDF) within 30 days after the applicable Notice to Proceed is issued. The Preliminary Design package shall include the following:
 - 1. Detailed project schedule (in Microsoft Project)
 - 2. System-level and block diagrams (in Visio format)
 - 3. Equipment room overview drawings
 - 4. Equipment rack/cabinet elevation drawings
 - 5. Tower profile drawings indicating antenna-mounting locations
 - 6. Detailed lists of materials for each site
 - 7. A detailed SATP outlining a comprehensive series of tests that will demonstrate proof of performance and readiness for operation.
 - 8. Preliminary CATP
 - 9. Cutover plan

Vendors should identify in the compliance matrix whether there are specific elements from this section that are not relevant to the project elements to which they are responding.

1.8.2 Final Design (60 days after contract award)

- A. The successful Vendor shall submit the Final Design package no later than 60 days after the applicable Notice to Proceed is issued. The Final Design package shall include the following:
 - 1. Any updates to previously submitted design or testing information
 - 2. Structural analyses and results

1.8.3 System Acceptance Test Plan (SATP)

- A. The successful Vendor shall include in its proposal a System Acceptance Test Plan (SATP) that outlines a comprehensive series of tests that will demonstrate proof of performance and readiness for final acceptance by the County.
- B. The successful Vendor shall submit any proposed updates or modifications to the SATP no later than 15 business days before the testing begins. The final SATP, which shall incorporate comments and requests by the County, must be approved by the County before the testing begins.

2. INSTRUCTIONS TO VENDORS

2.1 PROPOSAL FORMAT

- A. Vendors shall adhere to the proposal format provided below, organized by section:
 - 1. Section 1: Cover Letter
 - 2. Section 2: Table of Contents
 - 3. Section 3: Executive Summary
 - 4. Section 4: Qualifications
 - a. Vendors shall provide information in their proposal(s) that describes their experience and qualifications with similar projects, including the following, at a minimum:
 - i. Descriptions of Vendor's experience and qualifications
 - ii. Resumes of key personnel
 - iii. Supplementary information
 - 5. Section 5: Description of the system, including equipment, software, design, and services to be provided, including the following:
 - a. Paging system
 - b. Site infrastructure

- c. RF coverage predictions
 - d. Detailed equipment specification sheets for all proposed equipment
 - e. System design information
6. Section 6: Preliminary project schedule
7. Section 7: Additional information that is not covered in other sections
8. Section 8: Point-by-point compliance matrix
- a. Vendors shall provide compliance statements for each outline level or bullet point of this document. Vendors shall complete the compliance matrix provided in Appendix A: Compliance Matrix. Compliance statements are limited to the following three choices:
 - i. COMPLY—The proposal meets or exceeds the specified requirement.
 - ii. COMPLY WITH CLARIFICATION—The proposal does not meet the exact stated requirement; however, it meets a substantial portion of, or meets the intent of, the requirement. Vendors must provide a detailed explanation when using this statement.
 - iii. EXCEPTION—The proposal does not meet the specified requirement(s). Vendors must provide a detailed explanation when using this statement.
9. Section 9: System warranty information
10. Section 10: Total proposal cost and detailed pricing breakdown
- a. Vendors shall provide total proposal cost and itemized pricing for both equipment and services, utilizing the pricing sheets provided in Appendix B. Each line item shall indicate the Vendor's list cost and discount offered. Costs for services must include the hourly rate and the total number of hours. Costs for OPTIONAL items also shall be provided.

2.2 ADDENDA TO THE SPECIFICATIONS

- A. During the proposal period, the County may issue written addenda making changes or corrections to the specifications as issued. Such changes or corrections shall be included in the work and/or materials covered by the proposal, and such addenda shall become part of the

specifications and contract. Vendors shall document their receipt of any Addenda within their proposal submission.

2.3 AWARD OF CONTRACT

The County intends to evaluate responses based on the best interests of the County, and award a contract(s) to the Vendor that provides the best solution at a reasonable cost. However, the County specifically reserves the rights detailed below, consistent with procuring a system that best meets the needs of the County and system users.

- A. The County reserves the right to accept or reject any or all proposals, or any portion thereof
- B. The County reserves the right to accept all or part of any proposal depending solely upon the requirements and needs of the County
- C. The County reserves the right to seek clarifications of any proposal submitted, or specific aspects of any proposal, prior to the award of the contract. After seeking such clarification, the County will allow the Vendor an opportunity to provide the requested clarification.
- D. The County reserves the right to adjust item quantities
- E. The County reserves the right to negotiate acceptable terms and conditions with the selected Vendor to include at a minimum: insurance and performance bond requirements; invoicing requirements; and a payment schedule

3. TONE-AND-VOICE PAGING SYSTEM

3.1 GENERAL REQUIREMENTS

3.1.1 *Site Backhaul*

- A. All sites are connected via Ethernet. 4.9 GHz backhaul units currently are being utilized. Each of the locations will require a router capable of four ports. Each port will require virtual local area network (VLAN) addresses to allow for multiple networks to access.
- B. The main simulcast site will require eight ports. Each port will require VLAN addresses to allow for multiple networks to access.

3.1.2 *Migration and Installation Plan*

- A. The successful Vendor shall develop and implement a migration-and-installation plan that will enable the graceful implementation of the new system, integration with the County's MCC 7500

dispatch console operator positions, and side-by-side operation with the current paging system during the cutover period. The plan also must ensure quality of service of the current system until the new system is fully operational and subscribers are cut over.

- B. Vendors must state the downtime incurred for the cutover
- C. All current paging capabilities and integrations with the County's consoles and equipment must remain fully functional until the final, complete migration

3.2 RF NETWORK

3.2.1 Overview

- A. This section describes the transmitter network to be provided. The system will be a complete, three-site analog simulcast paging network.
- B. The system will include the following:
 - 1. Three active paging transmitters operating in simulcast mode
 - 2. Simulcast timing and control equipment
 - 3. Complete antenna systems at all three transmitter sites
 - 4. Interface to the County's microwave and landline backhaul network
 - 5. Installation, functional testing, and coverage testing
 - 6. Spares package
 - 7. The latest approved Vendor firmware
 - 8. Warranty on the complete system included and re-used hardware
- C. The paging system must be configured to allow pages to be sent from either the primary or the backup PSAP
- D. The County recognizes that its equipment shelters at the County Main and Wades Point tower sites may need minor modifications to ensure weather integrity. Vendor should explain any recommended modifications and quote as an optional item.
- E. It is preferable to have new equipment. If there is a recommendation on equipment re-use, please list as an option.

3.2.2 Coverage Requirements

- A. Vendors shall provide coverage maps for their system designs that guarantee the coverage to be provided from the three designated transmitter sites. It is desired that this system will provide 95 percent or higher pager coverage on hip in a 6-decibels (dB)-attenuation building in the bounded area of Pasquotank and Camden counties. Vendors shall identify the level of coverage that they will guarantee. The coverage guarantee must include consideration for areas experiencing non-coverage due to simulcast interference.

Four coverage maps shall be provided:

1. A map that predicts coverage from the current paging system (on-hip outdoor)
 2. A map that predicts coverage from the current paging system (on-hip in a 6-dB-attenuation building)
 3. A map that predicts guaranteed coverage from the new system (on-hip outdoor)
 4. A map which predicts guaranteed coverage from the new system (on-hip in a 6-dB-attenuation building)
- B. Vendors shall provide coverage studies demonstrating areas they predict will satisfy the coverage requirement. Studies must be completed based on a reliability standard of 95 percent. Vendors will provide link budgets accompanying the propagation studies that demonstrate the calculation of the design thresholds.
 - C. Vendors shall consider that the three sites listed are the only sites that can be used at this time.

3.2.3 Antenna Systems

- A. New antennas and transmission lines are required at the new sites. The antenna system must permit the continued operation of the existing system until it is decommissioned once users are cut over to the new system. If any antenna and lines are installed in place of existing equipment at the County Main tower site, the existing antennas and lines must be removed by the Vendor after new system commissioning.
- B. Antennas shall be low-passive intermodulation (PIM)-certified antennas, or equivalent in quality, gain, construction, and wind rating
- C. Antenna feed line shall be low loss, with a line loss of no more than 1.5 dB at each installation
- D. All antenna lines shall be installed and grounded per Motorola R56® guidelines or equivalent, with hanger kits

- E. All antenna feedlines shall be equipped with a Polyphaser or similar surge protector at the entrance point to the building. The surge protector shall be mounted on the internal ground bus bar at the entrance port.
- F. Each transmitter shall be equipped with a resonant cavity and dual-stage isolator in series between the transmitter output and antenna feedline, to minimize onsite intermodulation and interference

3.2.4 Mounting

- A. All transmitter and receiver equipment shall be mounted in open, industry-standard, 19-inch-wide, two-post racks. The successful Vendor shall coordinate placement and installation of the equipment with the County.

3.2.5 Simulcast Design

- A. Wide-area coverage will be accomplished through a simulcast design. Vendors shall provide designs that are consistent with this requirement. Vendors shall clearly explain how the design will minimize simulcast interference between multiple transmitters on the same frequency.

3.2.6 Synchronization

- A. Synchronization of digital data, and the launch of analog or digital transmissions, shall be controlled by global positioning system (GPS) timing reference. "Over-the-air" and "polled" synchronization is not permitted.

3.2.7 Frequency Stability

- A. Frequency stability between all transmitters operating on a single frequency must be maintained within ± 0.1 parts per million (ppm) when operating within a temperature range of 0 degrees ($^{\circ}$) Celsius (C) to $+50^{\circ}$ C (32° Fahrenheit [F] to $+122^{\circ}$ F)
- B. In the event that a frequency reference is lost, frequency stability must be maintained for a minimum of one day

3.2.8 Emissions

- A. Transmitters shall utilize emissions no greater than 11.2 kilohertz (kHz) in compliance with the FCC's narrowbanding mandate

3.2.9 Output Power

- A. Transmitters shall have a minimum output power as stated in the FCC license

3.2.10 Operating Voltage

- A. It is preferred that the transmitter and control equipment operate at 120 volts alternating current (VAC)/60 hertz (Hz) nominal. If the equipment requires an operating voltage other than 120 VAC/60 Hz nominal, appropriate conversion equipment shall be supplied.

3.2.11 Receivers

- A. One receiver shall be included in the design to support monitoring of the frequency, so as not to cause harmful interference to co-channel licensees. This receiver output shall provide a Carrier Operated Relay (COR) input to the paging terminal and cause the terminal to hold any page until the frequency is clear of any co-channel users.

3.3 REMOTE TERMINAL UNITS (RTU)

- A. RTU inputs shall be provided in sufficient quantities to monitor the paging system, including the following:
 - 1. Simulcast paging transmitters
 - 2. GPS reference
 - 3. Data network equipment, including routers, switches, etc.
 - 4. Other miscellaneous equipment – door open, alternating current (AC) power, fire alarm, etc.
- B. RTUs shall be fully compatible with network management terminals (NMTs) supplied, and shall provide complementary functionality wherever necessary to provide a complete working system
- C. RTUs shall support the following points:
 - 1. Status/alarms—20 minimum
 - 2. Control outputs—8 minimum
 - 3. Analog inputs—8 minimum
- D. RTUs shall support time stamp and system time synchronization
- E. Terminations for all points shall be provided on suitable terminal blocks providing ease of installation, testing, and maintenance

- F. If any devices support Simple Mail Transport Protocol (SMTP), Vendor shall describe how the current system can read these alarms
- G. Vendor shall provide the hardware for a centralized server to monitor the remote terminal alarms at the main dispatch center
- H. Connectivity from the County Main tower site to the main dispatch center is via analog microwave. Successful Vendor will connect the sites using the microwave transport.
- I. When an alarm occurs at any of the sites, an icon will appear on the MCC 7500 operator position

4. WARRANTY, MAINTENANCE, AND SUPPORT

4.1 WARRANTY

- A. The proposed paging system shall have a minimum warranty period of one year. The warranty period shall commence upon final acceptance of the system.
- B. Vendor shall provide a single telephone number that answers 24 hours a day, 7 days a week, 365 days a year (24 x 7 x 365), for service requests and warranty claims
- C. Vendor shall state in its proposal the name, address, and capabilities of the service station(s) providing warranty service
- D. The following procedures shall be followed during the warranty period:
 - 1. Warranty maintenance shall be performed 24 hours a day with no additional charges for work on critical infrastructure outside of normal 8:00 a.m. to 5:00 p.m. business hours
 - 2. The service facility shall provide prompt repair service on system outages, with service personnel arriving onsite within two hours after a service request
 - 3. The County shall be provided with written documentation indicating the cause of the service outage, the resolution, and all post-repair testing procedures to ensure proper operation. In the event County-owned spares are used to complete the repair, the model and serial number of both the defective unit and the spare shall be noted in the documentation.
 - 4. For all equipment needing factory or depot repairs, a comprehensive tracking system shall be put in place by the Vendor to track units to and from the factory/depot

- E. Re-used equipment will require the same warranty as the rest of the system.
- F. Vendor shall maintain and repair all systems, equipment, hardware, and software throughout the implementation, migration, and warranty periods. The County reserves the right to have technical staff onsite to witness, and if desired, assist in the maintenance and troubleshooting procedures. This does not relieve the successful Vendor from its warranty and maintenance responsibilities as defined in this specifications document.

4.2 PARTS AVAILABILITY

- A. From the date of final production to the seventh anniversary of the date of final production, Vendor shall maintain replacement parts for all delivered equipment

4.3 SPARE EQUIPMENT

- A. Vendor shall propose to the County recommended spare parts for the system, subsystems, and individual equipment

5. SYSTEM IMPLEMENTATION, TESTING, CUTOVER, AND ACCEPTANCE

5.1 SYSTEM INSTALLATION

- A. Installation shall include a complete, tested system to include placement of associated cabling, appropriate system layout, and terminal connections. Vendor shall provide associated power supplies and any other hardware, adapters and/or connections to deliver a complete operable system to the County at the time of acceptance.
- B. All installations shall be performed by factory-authorized or Vendor-affiliated service shops. Other shops or installers may be used upon agreement between the County and Vendor. Qualified, adequately trained personnel familiar with this type of work shall perform all installations.
- C. Vendor shall coordinate with others, as appropriate, to confirm that any preparation work that affects the installation of the base station equipment, such as tower work, coring, bracing, conduit, electrical, etc., is complete before final inspection
- D. Vendor shall provide and pay for all materials necessary for the execution and completion of all work. Unless otherwise specified, all materials incorporated into the permanent work shall be new and shall meet the requirements of this specifications document. All materials furnished and work completed shall be subject to inspection by the County or the County's representative.

- E. Equipment supplied as spare equipment shall not be used for installation of the proposed system. All spare equipment shall be supplied in an unused condition.
- F. All equipment and devices shall be cleaned internally and externally, and all damaged finishes shall be repaired.
- G. Worksites shall be left neat and broom swept upon completion of work each day. All trash shall be removed weekly.
- H. Inspection:
 - 1. The County shall conduct an inspection of the installations upon substantial completion. Any deficiencies shall be documented on a single punch list and provided to the Vendor for resolution.
 - 2. Final acceptance testing shall not commence until all punch-list items are resolved, or by agreement by the County

5.2 CUTOVER PLAN

- A. The successful Vendor shall be responsible for planning and coordinating the implementation of all equipment, subsystems, and the overall system
- B. Execution of the cutover plan shall ensure that new systems are brought online with minimum interruption to all existing systems and communications
- C. During final design, the successful Vendor shall deliver a preliminary cutover plan
 - 1. Vendor shall successfully complete all tests prior to the actual cutover of systems
 - 2. Vendor shall provide the necessary labor to cutover from existing systems to the proposed systems
 - 3. The County reserves the right to approve and change the cutover plan as it relates to any or all system components

5.3 COVERAGE TESTING

- A. Vendor shall submit a preliminary CATP with the preliminary design package. The preliminary CATP is subject to review and approval by the County and its Consultants.

B. CATP:

1. Coverage testing shall commence only after the paging system is fully tested and aligned
2. Vendor shall perform testing that replicates paging operation to the greatest extent possible. The testing shall be objective in quality
3. The test plan needs to be sufficient to validate that actual coverage is equal to or better than predicted coverage
4. It is not intended to drive the entire County for coverage testing. Please provide an efficient coverage methodology for proving proposed coverage

5.4 SYSTEM ACCEPTANCE TESTING

- A. Prior to system acceptance testing, the successful Vendor shall verify and document that all equipment, hardware, and software are upgraded to the latest factory revision. Multiple revision levels among similar equipment are not acceptable. The County shall be given two weeks written notice that the system is ready for system acceptance testing.

B. SATP:

1. Vendor shall use the completed and approved SATP. It is expected that the SATP has been performed and all tests have been successful before the County witnesses the official SATP. The SATP shall be signed and dated by Vendor and County representatives following completion of all tests. All tests in the SATP shall be marked as either pass, fail, or pass qualify.
2. Vendor shall provide all necessary technical personnel and test equipment to conduct SATP tests. All deviations, anomalies, and test failures shall be resolved at the Vendor's expense.
3. Failed tests shall be documented, corrected, and retested. All defective components shall be replaced and retested. Defective components that cannot be corrected shall be replaced at the Vendor's expense.
4. The fully executed and completed SATP document shall be provided to the County

5.5 POST-CUTOVER 30-DAY OPERATIONAL TEST

- A. Vendor shall perform a 30-calendar-day operational test of the system to ensure that all hardware and software defects have been corrected. The fully integrated operation of the

system, including all individual subsystems, shall be demonstrated during these tests. The tests shall be designed to demonstrate the reliability, long-term stability, and maintainability of the systems. A failure of any critical component of the system during this test will cause the test to restart after the repair is completed.

B. The following is a listing of items that define a critical failure:

1. System loses encoder connectivity
2. More than one radio operator position loses paging ability
3. A simulcast failure affecting one or more sites
4. Loss or failure of system configuration database
5. Loss or failure of user database

5.6 AS-BUILT DOCUMENTATION

A. At the completion of the installation phase, the successful Vendor shall provide one (1) complete set of electronic complete as-built documentation as outlined below:

1. Equipment provided
2. Plan and elevation drawings of all equipment, including antennas on towers
3. Cabling and terminations
4. Block and system-level diagrams
5. Pager programming parameters
6. Setup and alignment information
7. Successfully completed, signed, and dated SATP

B. One (1) complete hard copy set of maintenance and operations manuals shall be provided at each radio site

5.7 SYSTEM ACCEPTANCE

A. The County shall deem the system ready for final acceptance following successful completion and approval of the following:

1. Final design submittals
2. System installation
3. Final inspection and punch list resolution
4. As-built documentation
5. SATP
6. CATP

Appendix A – Point-by-Point Compliance Matrix

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| Remote Monitoring | | | |
| Warranty | | | |
| Misc. Equipment | | | |
| Shelter Enhancements | | | |
| Engineering Studies | | | |
| CATP Costs | | | |