AGENDA REPORT
February 12, 2019

Public Safety Radio Frequency Equipment Migration to Project 25 Standards

SUBJECT:
Permission to issue an invitation to bid (ITB) from qualified vendors to design and provision the migration of the Brevard County Public Safety Simulcast System radio frequency equipment/sites to Project 25 (P25) Phase II, completing the transition from analog to a fully digital system.

FISCAL IMPACT:
There is no impact to the General Fund. The implementation costs will be part of the annual budget of the 800 MHz Public Safety Radio System under Emergency Management, utilizing the $12.50 Surcharge, limited by Section 318.21(9), Florida Statutes, to fund intergovernmental radio communication programs; user fees; and revenue from cellular co-location assignments on County-owned towers dedicated to the 800 MHz Public Safety Radio System, as approved by the BOCC in regular session on December 4, 2018. Current user fee billing encompasses radio system operating costs during a designated 12-month period, and does not include any charges for any form of a reserve.

DEPT/OFFICE:
Emergency Management

REQUESTED ACTION:
It is requested that the Board of County Commissioners approve advertisement of an Invitation to Bid to migrate the 800 MHz Radio Frequency (RF) equipment/sites from Enhanced Digital Access Communications System (EDACS) to P-25 Phase II, completing the transition from analog to digital conforming to the latest FCC standards and providing full interoperability with regional, State and Federal public safety agencies. Approval is further requested to perform the following actions:

1. Authorize Emergency Management/800 MHz Radio System Administration to utilize the $12.50 surcharge fund for the RF equipment/site upgrades.
2. Authorize Emergency Management/800 MHz Radio System Administration to accrue reserves, as needed, from the annual radio user fees, without increasing the current annual user fees, and not exceeding $250,000/year in total to be dedicated to these necessary upgrades.
3. Authorize the County Manager or his designee to sign/execute any documents and

renewals on behalf of the Board as may be required to execute/administer any new agreements and any subsequent extensions, subject to approval by the County Attorney's Office and Risk Management.

4. Authorize the County Manager or his designee to approve any associated budgetary changes.

SUMMARY EXPLANATION and BACKGROUND:

The Brevard County 800 MHz Radio System is used by all the law enforcement, fire-rescue and other public safety agencies to communicate with each other and with their dispatch centers. The system supports 63 County/City/Federal agencies/departments and provides interoperability with the State of Florida Law Enforcement Radio System and Florida Region 5.

On December 2012, the BOCC approved the expansion and improvement of the 800 MHz Radio System to improve radio coverage, in-building signal penetration, and system capacity, and to provide the core platform necessary to migrate the system to the new P25 standards. Under that project Emergency Management/800 MHz Radio System Administration replaced a four-tower-site multi-site system with a nine-tower-site simulcast system, implemented the P25 core platform and migrated all the radio dispatch consoles to the P25 core. Once the P25 core and additional towers are in place, in order to fully adopt the P25 standards and interoperable communication, the next step is to migrate the radio frequency (RF) equipment/sites to the new platform.

Emergency Management/800 MHz Radio Administration and the $12.50 Advisory Committee anticipate a phased replacement of the existing RF equipment, as funding becomes available, over a six-year period at a cost not to exceed $5 million in total.

CLERK TO THE BOARD INSTRUCTIONS:

Send Clerk Memorandum to Emergency Management/800 MHz Radio System.

ATTACHMENTS:

Description

No Attachments Available

BREVARD County
BOARD OF COUNTY COMMISSIONERS

FLORIDA'S SPACE COAST

Tammy Rowe, Clerk to the Board, 400 South Street • P.O. Box 999, Titusville, Florida 32781-0999

Telephone: (321) 637-2001
Fax: (321) 264-6972
Tammy.Rowe@brevardclerk.us

February 13, 2019

MEMORANDUM

TO: Kimberly Prosser, Emergency Management Director

RE: Item F.14., Public Safety Radio Frequency Equipment Migration to Project 25 Standards

The Board of County Commissioners, in regular session on February 12, 2019, approved advertisement of an Invitation to Bid to migrate the 800 MHz Radio Frequency (RF) equipment/sites from Enhanced Digital Access Communications System (EDACS) to P-25 Phase II, completing the transition from analog to digital conforming to the latest FCC standards and providing full interoperability with regional, State, and federal public safety agencies; authorized Emergency Management/800 MHz Radio System Administration to utilize the $12.50 surcharge fund for the RF equipment/site upgrades; authorized Emergency Management/800 MHz Radio System Administration to accrue reserves, as needed, from the annual radio user fees, without increasing the current annual user fees, and not exceeding $250,000/year in total to be dedicated to these necessary upgrades; authorized the County Manager, or his designee, to sign/execute any documents and renewals on behalf of the Board as may be required to execute/administer any new agreement and any subsequent extensions, subject to approval by the County Attorney's Office and Risk Management; and authorized the County Manager, or his designee, to approve any associated budgetary changes.

Your continued cooperation is always appreciated.

Sincerely,

BOARD OF COUNTY COMMISSIONERS
SCOTT ELLIS, CLERK

Tammy Rowe

Tammy Rowe, Deputy Clerk

cc: Finance
Budget

RECEIVED
BREVARD COUNTY
FEB 19 2019
EMERGENCY MANAGEMENT

Brevard COUNTY
Purchasing Services

Purchasing Services
2725 Judge Fran Jamieson Way
Building C, Room 303
Viera, Florida 32940

NOTICE OF AWARD

July 31 2019

B#7-19-84/ Radio Frequency Site Migration to P25 Brevard County 800 Mhz Public Safety Radio

PROCUREMENT ANALYST: Stephanie Reynolds

CONTRACTOR	CONTRACTOR CITY AND STATE	MEETS MINIMUM REQUIREMENTS	ITEMS AWARDED	AWARD AMOUNT
Communications International	**Vero Beach, FL**	**Yes**	**All**	**$3,691,306.92**
Ashtin Communications, Inc.	Gainesville, FL	Statement of No Bid		

☐ BOARD AWARD--AGENDA ATTACHED

☒ APPROVED AWARD (NON-BOARD AGENDA):
(Per Sections III.E. & III.I. & J., BCC-25, PROCUREMENT)

Steven A. Darling Jr., Purchasing Manager

☐ Award to overall lowest, most responsive bidder, minimum three responses received.
☐ Award to other than low, with low bid being non-responsive.
REASON FOR NON-RESPONSIVENESS:
☒ Award to low bid, less than three responses received.

FOR PURCHASING USE ONLY:

☐ ONE-TIME PURCHASE

☒ ANNUAL BID:
EFFECTIVE DATE: July 31, 2019 ENDING DATE: July 30, 2025
RENEWAL OPTION ☐ One year ☐ Other (fill in)

☐ Prompt Payment Discount Offered ☐ Yes_____ (Terms) ☒NO
☐ Performance and payment bonds received with construction contract documents.
☐ Release Cashier's or Certified Check Received for Bid Deposit on Bids

SPECIAL INSTRUCTIONS TO AWARDED VENDOR:

☐ Please provide certificate of insurance.
☒ Please provide performance and payment bonds as required.
☐ OTHER:

PICK-UP WED.

Deborah Thomas

From: Morgan, Lisa <Lisa.Morgan@brevardfl.gov>
Sent: Monday, February 3, 2020 8:33 AM
To: Deborah Thomas
Cc: Morgan, Lisa
Subject: RE: CONTRACTS
Attachments: CI P25 UPGRADE CONTRACT NMBR PENDING.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Deborah:

Thanks for advising me but I have a dentist appointment late on Tuesday so it will have to be some time on Wednesday before I can get there. Also, attached is the Tammy Gram (2/13/19), the Notice of Award after the bids (7/31/19) and the Initial Contract Review and Approval Form for the contract. I will also send you an email with the contract number after I have uploaded this week.

Lisa Morgan
Brevard County Emergency Management/800 MHz
Phone: 321-637-6670
Fax: 321-633-1738
lisa.morgan@brevardfl.gov

From: Deborah Thomas <deborah.thomas@brevardclerk.us>
Sent: Friday, January 31, 2020 3:54 PM
To: Morgan, Lisa <Lisa.Morgan@brevardfl.gov>
Subject: CONTRACTS

Hi Lisa:

I have put the Contracts on Mr. Ellis' desk.

He should be here on Tuesday, February 4th in the afternoon.

If you want to come then and pick up.

Also, when you get a chance please forward the TammyGrams for those contracts.

Have a good weekend.

BREVARD COUNTY
BOARD OF COUNTY COMMISSIONERS

INITIAL CONTRACT REVIEW AND APPROVAL FORM

SECTION I - GENERAL INFORMATION

1. Contractor: Communications International Inc.	
2. Fund/Account #: 1382/285700	**3. Department Name:** Emergency Management
4. Contract Description: Radio Frequency Site Migration to P25 Phase 2	
5. Contract Monitor: Lisa Morgan	**7. Contract Type:**
6. Dept/Office Director: Kimberly Prosser	TERM CONTRACT

SECTION II – REVIEW AND APPROVAL TO ADVERTISE

COUNTY OFFICE	APPROVAL YES	APPROVAL NO	SIGNATURE
User Agency	✓		Prosser, Kimberly
Risk Management	✓		Matt Lairsey
County Attorney	✓		Powers, Melissa Digitally signed by Powers, Melissa Date: 2019.05.15 14:57:22 -04'00'

SECTION III – REVIEW AND APPROVAL TO EXECUTE

COUNTY OFFICE	APPROVAL YES	APPROVAL NO	SIGNATURE
User Agency	✓		Prosser, Kimberly
Risk Management	✓		Lairsey, Matt Digitally signed by Lairsey, Matt Date: 2019.11.22 13:52:04 -05'00'
County Attorney	✓		Powers, Melissa Digitally signed by Powers, Melissa Date: 2019.12.26 10:32:14 -05'00'

SECTION IV - CONTRACTS MANAGEMENT DATABASE CHECKLIST

CM DATABASE REQUIRED FIELDS	Complete ✓
Department Information	
Department	
Program	
Contact Name	
Cost Center, Fund, and G/L Account	
Vendor Information (SAP Vendor #)	
Contract Status	
Contract Title	
Contract Type	
Contract Amount	
Storage Location (SAP)	
Contract Approval Date	
Contract Effective Date	
Contract Expiration Date	
Contract Absolute End Data (No Additional Renewals/Extensions)	
Material Group	
Contract Documents Uploaded in CM database (Initial Contract Form with County Attorney/ Risk Management Approval; Signed/Executed Contract)	
"Right To Audit" Clause Included in Contract	
Monitored items: Uploaded to database (Insurance, Bonds, etc.)	

Brevard County BOCC Contract Number

CONTRACT: RADIO FREQUENCY SITE MIGRATION TO P25 PHASE 2

THIS CONTRACT by and between the Board of County Commissioners of Brevard County, Florida, a political subdivision of the State of Florida (hereinafter the "County"), and **Communications International, Inc.**, a business having its primary business location at **4450 US Hwy 1, Vero Beach, FL 32967**, (hereinafter the "Contractor").

WITNESSETH:

WHEREAS, the County issued an Invitation to Bid (ITB) entitled "RADIO FREQUENCY SITE MIGRATION TO P25 PHASE 2 # B-7-19-84" and originally dated June 20,2019, as amended on June 28, 2019 and July 10, 2019 (collectively, the "ITB"), requesting bids to provide County with a system and services as set forth in the ITB;

WHEREAS, the County has selected Contractor's Response and now desires to enter into a Contract with Contractor to provide County with the system and services set forth in ITB; and

WHEREAS, the provision of such services shall mutually benefit the parties hereto and the residents of Brevard County, Florida.

NOW THEREFORE, in consideration of the covenants herein contained, it is mutually agreed between the parties as follows:

1. ATTACHMENTS

The attachments listed below are incorporated into and made part of this Contract.

ATTACHMENT A – Scope of Work (6 pages)
ATTACHMENT B – Contractor's Price Sheet (1 page)
ATTACHMENT C – Software License Agreement (1 page)
ATTACHMENT D – Sample Acceptance Test Plan (130 pages)
ATTACHMENT E – Insurance(s) (1 page)
ATTACHMENT F – Task Order 1 (1 page)
ATTACHMENT G – Task Order 2 (1 page)
ATTACHMENT H – Task Order 3 (1 page)
ATTACHMENT I – Task Order 4 (1 page)
ATTACHMENT J – Task Order 5 (1 page)

2. SCOPE OF THE WORK

The Contractor shall be prepared to furnish all labor, materials, equipment, machinery, tools, apparatus and transportation to perform all work or services specified in the Scope of Services, Attachment A, attached hereto and made a part hereof by this reference.

3. TERM

The term of the Contract shall begin December 1st, 2019 (Effective Date) and continue through six (6) years.

4. PAYMENTS

County shall pay the Contractor for Work or Services provided under this Contract as based on an agreed upon implementation schedule to this Contract and made a part of this Contract by this reference. The County reserves the right to deduct from any contractor invoice an amount for defective or nonconforming work, or for work not provided but invoiced. The County shall remit payment in accordance with the Florida Prompt Payment Act, Florida Statute section 218.70, et seq.

5. INDEMNIFICATION

The Contractor shall indemnify and hold harmless the County and its agents and employees from and against all claims, damages, losses, and expenses, including attorney's fees arising out of or resulting from the performance of its work under this Contract, where such claim, damage, loss, or expense is caused, in whole or in part, by the act or omission of the Contractor, or anyone directly or indirectly employed by the Contractor, or anyone for whose acts any of them may be liable, regardless of whether or not it is caused by in part by a party indemnified thereunder. In any and all claims against the County, or any of its agents or anyone directly or indirectly employed by the Contractor, or anyone for whose acts any of them may be liable, indemnification obligation under this paragraph shall not be limited in any way by a limitation on the amount or type of damages, compensation or benefits payable by or for the custodial contractor, under workers' compensation acts, or other related policies of insurance. The parties acknowledge specific consideration has been exchanged for this provision.

6. MODIFICATIONS TO CONTRACT

This Contract, together with any exhibits, attachments, task assignments and schedules constitute the entire agreement between the County and the Contractor and supersedes all prior written or oral understandings. This Contract and any exhibits, task assignments and schedules may only be amended, supplemented or canceled by a written instrument duly executed by the parties hereto.

7. INSURANCE

The Contractor, at its own expense, shall keep in force and at all times maintain during the term of this Contract:

a. **General Liability Insurance:** General Liability Insurance issued by responsible insurance companies and in a form acceptable to the County, with a $ 1,000,000 combined single limit for each occurrence to include the following coverage: Operations, Products and Completed Operations, Personal Injury, Contractual Liability covering this contract, "X-C-U" hazards, and Errors & Omissions.

b. **Automobile Liability Insurance:** Automobile Liability coverage shall be in the minimum amount of One Million Dollars ($1,000,000) which includes coverage for all owned, non-owned and rented vehicles with a $ 1,000,000, combined single limit for each occurrence.

c. **Workers' Compensation and Employers Liability Insurance:** Full and complete Workers' Compensation Coverage for all employees of the contractor and subcontractors, as required by State of Florida law, shall be provided.

d. **Professional Liability Insurance:** in the amount of $ 1,000,000 per claim.

e. **Insurance Certificates:** The Contractor shall provide the County with Certificate(s) of Insurance on all the policies of insurance and renewals thereof in a form(s) acceptable to the County. The General Liability and Automobile Liability Policies shall provide that Brevard County Board of County Commissioners be an additional insured. The County shall be notified in writing of any reduction, cancellation or substantial change of policy or policies at least thirty (30) days prior to the effective date of said action. All insurance policies shall be issued by responsible companies who are acceptable to the County and licensed and authorized under the laws of the State of Florida.

8. ATTORNEY'S FEES

In the event of any legal action to enforce the terms of this Contract each party shall bear its own attorney's fees and costs.

Any action brought to enforce the terms or litigate the terms of this Contract shall be brought in the venue of Brevard County, Florida. Any Federal action may only be initiated in the Middle District Court, Orlando Division. Trial of any action, whether brought in State or Federal Court, shall be non-jury.

9. ASSIGNMENTS

Contractor shall not assign any portion of this Contract without the written permission of the County.

10. TERMINATION

If either party fails or refuses to perform any of the provisions of this Contract or otherwise fails to timely satisfy the contract provisions, either may notify the other party in writing of the nonperformance and terminate the Contract or such part of the Contract as to which there has been delay or a failure to properly perform. Such termination is effective upon the other party's receipt of the Notice of Termination. Any work completed or services provided prior to the date of termination shall, at the option of the County, become the property of the County. The County is only responsible for payment for work, on a pro rata basis, completed prior to the effective date of termination.

11. TERMINATION FOR CONVENIENCE

The County retains the right to terminate the Contract, in part or in its entirety without cause, upon thirty (30) days prior written notice to the Contractor. In such event, the Contractor shall be paid for services performed through the date of termination on a pro rata basis.

12. INDEPENDENT CONTRACTOR

The Contractor shall perform the services under this Contract as an independent contractor and nothing contained herein shall be construed to be inconsistent with this

the Contractor or any of its agents or employees to be the agent, employee or representative of the County.

13. RIGHT TO AUDIT RECORDS/PUBLIC RECORDS

The County and its auditors shall be entitled to audit the books and records of the Contractor to the extent that such books and records relate to the performance of this Contract. Said records shall be made available, upon request, for audit purposes to Brevard County and its auditors. Such books and records shall be maintained by the Contractor for a period of three (3) years from the date of final payment under this Contract unless a shorter period is otherwise authorized in writing.

Both parties understand that Brevard County is subject to the Florida Public Records Law, Chapter 119, Florida Statutes and all other applicable. If records provided by the Contractor do not fall under a specific exemption under Florida or federal law, the records provided by the Contractor to the County must be provided to anyone making a public records request. It will be the Contractor's duty to identify the information which it deems is exempt under Florida or federal law and identify the statute number which requires the information be held exempt.

Should any person or entity make a public records request of the County which requires or would require the County to allow inspection or provide copies of records which the Contractor maintains are exempt under the Public Records Law or otherwise confidential, it shall be the Contractor's obligation to provide the County within 24 hours (not including weekends and legal holidays), or notification by the County to the Contractor of the records request, of the specific exemption or confidentiality provision to allow the County to comply with the requirements of Florida Statute 119.07(1)(e) and (f). Should the County face any kind of legal action to require or enforce inspection or production of any records provided by the Contractor to the County which the Contractor maintains are exempt or confidential from such inspection/production as a public record, the Contractor shall hire and compensate attorney(s) who shall represent the interests of the County as well as the Contractor in defending such action. The Contractor shall also pay any costs to defend such action and shall pay any costs and attorney's fees which may be awarded pursuant to Fla. Stat. 119.12.

14. SECTION 508 ACCESSIBLE DOCUMENTS

The Contractor agrees that all documents that are part, required, or a direct result of this Contract shall follow Section 508 of the United States Rehabilitation Act. Complex maps, blueprints, plats, and construction/building plans are exempt.

15. UNAUTHORIZED ALIEN WORKERS AND E-VERIFY

Brevard County will not intentionally award publicly-funded contracts to any contractor who knowingly employs unauthorized alien workers, constituting a violation of the employment provisions contained in 8 U.S.C. Section 1324a(e) (Section 274A(e) of the Immigration and Nationality Act "INA"). The County shall consider a Contractor's intentional employment of unauthorized aliens as grounds for immediate termination of this Contract.

Employment Eligibility Verification (E-Verify):

The Contractor:

(1) Shall utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the COMPANY during the term of the contract; and

(2) Shall expressly require any subcontractors performing work or providing services pursuant to this Contract to likewise utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the subcontractor during the term of this Contract; and

(3) Agrees to maintain records of its participation and compliance with the provisions of the E-Verify program, including participation by its subcontractors as provided above, and to make such records available to the COUNTY consistent with the terms of the Contractor's enrollment in the program. This includes maintaining a copy of proof of the Contractor's and subcontractors' enrollment in the E-Verify Program.

Compliance with the terms of this section is made an express condition of this Contract and the COUNTY may treat a failure to comply as a material breach of this Contract.

A contractor who registers with and participates in the E-Verify program may not be barred or penalized under this section if, as a result of receiving inaccurate verification information from the E verify program, the contractor hires or employs a person who is not eligible for employment.

Nothing in this section may be construed to allow intentional discrimination of any class protected by law.

Contractor shall execute a Confirmation of E-Verify Form which shall be incorporated herein and referred to as Attachment "B".

16. FEDERAL TAX ID NUMBER

The Contractor shall provide to the County their Federal Tax ID Number or, if the Contractor is a sole proprietor, a Social Security Number.

17. EMPLOYMENT

The Contractor shall not engage the services of any person or persons now employed by the County, including any department, agency, board or commission thereof, to provide services relating to this Contract without written consent from the County.

18. PUBLIC ENTITY CRIMES

A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with a public entity, and may not transact business with any public entity in excess of the threshold amount provided in s. 287.017 for

CATEGORY TWO for a period of thirty six (36) months from the date of being placed on the convicted vendor list.

19. OBLIGATIONS

The County's obligations set forth in this Contract shall be performed by County in a timely and proper fashion in accordance with the Installation Schedule, or as otherwise agreed upon by County and Contractor, to allow Contractor to timely perform its obligations under this Contract.

a. County shall designate a Project Manager to act as County's primary interface with the Contractor.

b. County shall provide ready access to all sites owned, leased or otherwise controlled by County.

c. All towers, shelters and associated equipment provided or mandated by County shall be satisfactory in all manners to accommodate the System proposed by the Contractor.

During the term of this Contract, the Contractor shall furnish all the Services specified in this Contract. Contractor understands and agrees that this is a requirement and that the County has no responsibility or obligation to the Contractor to assist in providing the required services.

20. DELIVERY, TITLE AND RISK LOSS

Contractor shall ship the Hardware to County at Contractor's expense on or before the dates set forth in the Installation Schedule, unless otherwise provided for in the Statement of Work. Partial deliveries shall be permitted. Upon delivery to the carrier, title to each portion of the Hardware and all risk of loss or damage shall pass to County; provided, however, that Contractor shall remain responsible until Acceptance of the System for loss or damage resulting from the willful misconduct or negligent acts or omissions of Contractor, its employees, agents, and subcontractors. County shall keep the Hardware fully insured for the total amount of all monies then due, or yet to become due, to Contractor with respect to this Contract.

21. SOFTWARE LICENSE

Subject to the terms and conditions of the Software License Agreement attached hereto as Attachment D, County is granted a license to use the Software only in conjunction with the System purchased under this Contract. "Software" means the "Licensed Programs" as defined in the Software License Agreement.

22. EXCUSABLE DELAYS

In the event of any delay or failure excused by this Section, Contractor shall as soon as practical notify County and shall at the same time, or at the earliest practical date after such notice, specify the revised delivery and performance dates. In the event of such delay, the time of delivery or of performance shall be extended for a reasonable time period to compensate for the time lost by Contractor by reason of the delay. Contractor shall not be liable for delays in delivery or failure to perform due directly or indirectly to:

a) Causes beyond Contractor's reasonable control,

b) Acts of God, acts (including failure to act) of any governmental authority (de jure or de facto), wars (declared or undeclared), riots, revolutions, strikes or other labor disputes, fires, floods, sabotage, nuclear incidents, earthquakes, storms, epidemics,

c) Contractor's inability to timely obtain necessary materials, items, components or services from suppliers who are affected by the foregoing circumstances or

d) The failure of the County to perform its obligations hereunder in a timely manner. The foregoing shall apply even though any of such causes exists at the time of signature of the Contract by Contractor or occurs after delays in Contractor's performance of its obligations due to other reasons.

23. PUBLIC RECORDS – EXEMPTIONS AND HOMELAND SECURITY

If Contractor receives any request for any records maintained or created pursuant to this Contract, before the Contractor (meaning any of its officers, agents, employees or subcontractors) provides records to anyone other than designated representatives of the County, it shall inform the designated representative of the County of the request for records by faxing or emailing the representative a copy of the request or a written description of the request. The Contractor shall not release any records until it receives the approval from the County's designated representative. All records must be reviewed for compliance with the Florida Public Records Act and the federal Homeland Security Act.

If the Contractor fails to comply with this paragraph on records, it shall reimburse the County for any attorney's fees and costs it incurs to retrieve such records, for any damages the County sustains as a result of the release of the records, and for the replacement of any systems, equipment, software, etc. necessary to maintain the security of the County's two-way radio system.

24. ORDER OF PRECEDENCE

Any inconsistency between this Contract, Purchase Order Releases, the specifications and other documents will be resolved by giving precedence to those documents in the following order, with the document to be given greatest precedence listed first:

(1) This Contract and Attachments.

(2) Ci's response to the Brevard County Invitation to Bid (P25 Radio Migration B-7-19-84)

(3) Purchase Orders with non-standard terms and conditions accompanied by a mutually approved Statement of Work.

25. TESTING AND ACCEPTANCE

Contractor shall notify County that the System is ready for Acceptance Tests at least ten (10) days before commencement of the Acceptance Tests. County and Contractor shall jointly commence the Acceptance Tests on the date specified in Contractor's notice (or other mutually agreeable date) and a representative of Contractor and a representative of County shall sign off on the form provided as part of the test procedure whether each item of the test was passed or failed. If the System does not fulfill the requirements of the Acceptance

Tests, Contractor shall correct the defects at no additional cost to County as soon as practicable. Upon correction of the defects the Acceptance Tests for the applicable part of the System shall be repeated in accordance with the procedures set forth in this Section. Successful completion of the Acceptance Test is the sole criterion for technical system acceptance and the initiation of the warranty period. Final system acceptance shall occur when the Hardware and Software for the System, Documentation Deliverables and Services have been furnished, delivered, installed and tested.

26. WARRANTIES

Hardware and installation Services furnished by Contractor under this Contract are warranted by the Contractor to be free from defects in material and workmanship and shall conform to the Contract specifications for a period equal to the longer of twelve (12) months or in the case of Hardware, the number of months under the warranty offered by the manufacturer of such equipment, from the Acceptance Date (the "Warranty Period"). Any and all claims for breach of this warranty are conclusively deemed waived unless made within the Warranty Period. The warranty period for additional Hardware purchased by County from Contractor after System Acceptance shall be for a period equal to the longer of twelve (12) months or the number of months under the warranty offered by the manufacturer of such equipment, from the date the equipment is delivered to County (the "Additional Warranty Period"). Any and all claims for breach of this warranty are conclusively deemed waived unless made within the Additional Warranty Period.

During the Warranty Period if any component of the Hardware or portion of the installation Services fails to meet the foregoing warranties, Contractor's sole obligation and County's exclusive remedy under this warranty shall be the correction by Contractor of the failure at Contractor's option (1) by repairing any defective component of the Hardware, or (2) by furnishing any necessary repaired or replacement parts, or (3) by the redoing of the faulty installation. Any such failure, or the repair or replacement of the defective component or the redoing of any installation, shall not extend the Warranty Period. Where such failure cannot be corrected by Contractor's reasonable efforts, the Parties will negotiate an equitable adjustment in price. Contractor will be responsible for all charges incurred in returning defective parts to Contractor's plant and shipping repaired or replacement parts to County. All warranty labor must be performed by an authorized service group approved by Contractor either at its place of business, for mobile or portable equipment, or at the County's location for fixed location equipment should Contractor determine that it is not feasible to return the fixed location equipment to Contractor's authorized service group.

27. CONSTRUCTION OF CONTRACT

The parties hereby acknowledge that they fully reviewed this Contract, its attachments and had the opportunity to consult with legal counsel of their choice, and that this Contract shall not be construed against any party as if they were the drafter of this Contract.

28. NOTICE:

Notice under this Contract shall be given by certified mail or hand delivery as follows:

To Brevard County:
Brevard County Emergency Management
1746 Cedar Street
Rockledge, Florida 32955
ATTN to: Emergency Management Director

To the Contractor:
Communications International, Inc.
4450 US Hwy 1
Vero Beach, FL 32967
ATTN: Jeana Quintana
E-mail: jquintana@ask4ci.com

IN WITNESS WHEREOF, the parties have hereunto set their hands and seals on the day and year first above written.

THE COUNTY
Brevard County Board of County Commissioners,
A Political subdivision of the State of Florida

By: _____

Name: Matthew Wallace

Its: Public Safety Director

Date: 28 Jan 20

ATTEST/AUTHENTICATED:

_____

APPROVED AS TO FORM:

_____

CONTRACTOR
By: Communications International, Inc.

_____

Name: Jeana Quintana

Its: **CFO**

Date: 11/22/19

_____
WITNESS
Henry Erfurt
Print Name

ATTACHMENT A: SCOPE OF WORK

1. Introduction/Purpose

The purpose of this Scope of Work is to set forth the requirements to provide, install, and optimize a turnkey solution to transition the Brevard County 800 MHz Enhanced Digital Access Communication System (EDACS) channels to the existing P25 core platform, in order to coexist with the existing three-cell EDACS simulcast system as a two-cell P25 Phase 2 simulcast system.

2. Background

The Brevard County 800 MHz Radio System is used by all the Brevard County law enforcement, fire rescue and other public safety agencies to communicate with each other and with their dispatch centers. The system supports 63 County/City/Federal agencies/departments and provides interoperability with the State of Florida Law Enforcement Radio System and Florida Region 5.

The price (see Attachment B) is all-inclusive of direct and indirect costs, including, but not limited to travel, overhead, fee or profit, clerical support, managerial (administrative) support, all documents, reports, forms, reproduction and any other costs. No additional fees or costs shall be paid by the County unless there is a change in the scope of work.

3. General requirements

a) The Contractor shall provide a turnkey solution and perform the necessary technical services to provide an operational and secure radio network, adhering to the best practices of cybersecurity.

b) The Contractor shall use Brevard County existing frequencies/licenses, sites/structures and connectivity.

c) Brevard County does not provide storage space; all equipment shall be delivered and transported to the sites as needed.

d) The Contractor must present a Customer Design Review (CDR) to Brevard County within 45 days of the Contract being fully executed by both parties. This CDR shall cover the finalized scope of work and all aspects of the project for review by the County before a notice to proceed will be issued.

e) Installation of all electrical equipment and associated wiring shall comply with the latest edition of the National Electrical Code.

f) The Contractor is responsible for procuring and installing all outside conduits including excavating, trenching and back filling. Brevard County must approve all pathways for conduit both inside and outside of the building prior to installation.

g) Construction for incoming cables or fiber to the County buildings or shelters shall be installed within Vendor supplied conduit.

h) Aerial entries to sites or buildings shall be avoided.

i) Exterior wall penetrations must be waterproof and secure. Internal wall penetrations must meet all fire stopping and fire code requirements.

j) All metallic cables entering buildings or shelters must have surge suppression and be grounded to the shelters common grounding system.

k) All work shall be planned, coordinated and conducted with no unplanned disruption of service to the existing County radio system. The Contractor shall be responsible for the costs of any system recovery costs associated with an unplanned radio system outage.

l) The Contractor shall ensure that all personnel, who will be working at County's facilities, pass the Brevard County Sheriff's Office background check. All associated costs with the background checks shall be the responsibility of the Contractor.

m) All equipment provided must be able to be integrated to the existing 800 MHz Radio System and to be added to the Brevard County 800 MHz Maintenance Contract. The cost of maintenance of equipment added under this Contract is covered under the pricing as set forth in Attachment "C".

4. Instructions/service manuals

Any manuals or technical references required to perform the work/services under this Contract shall be provided by the Contractor at the sole expense of the Contractor.

5. Materials and workmanship

All replacement equipment and component parts furnished shall be new original equipment manufacturer's parts, or new after-market parts, which are interchangeable and comparable to new original equipment manufacturers parts, meet all requirements of this specification, the specifications of the manufacturer, and be in operable condition at time of delivery. Used or reconditioned parts may only be used on a case-by-case basis at the specific authorization of the County's Public Safety Radio System Manager.

6. Project management

Contractor shall provide a Project Management Plan (PMP) which includes a detailed Work Breakdown Structure (WBS), project scope, deliverables, and project schedules to completion, QA/QC processes, and cutover plan.

The Contractor's Project Manager shall be PMP certified and have a minimum of 3 years' experience with similar projects.

The project management plan (PMP) shall describe how the Contractor intends to monitor and control the installation, deployment and cutover of the proposed system.

Project status meetings shall be established between the County team and the Contractors' PM on monthly basis.

The Contractor will develop and maintain a project schedule including tasks, milestones, start and end dates, task prerequisites, and task owners based on the approved WBS. The project schedule shall be updated with actual dates as tasks are completed.

The schedule shall address the following:

- Detailed design review
- Equipment delivery
- Site surveys
- Final system design
- System installation
- System cutover
- System documentation and delivery
- System optimization
- System acceptance testing
- System training

The Contractors' PM shall maintain a punch list in real time that is available to the County.

7. Project engineer

The Contractor's Project Engineer shall have the primary responsibility for managing the system design and ensuring that the system is installed in accordance with the approved system design.

The Project Engineer shall be responsible for the development and execution of the Acceptance Test Plan and guide the County through the processes necessary to prove the system performs as specified.

8. Documentation requirements

Contractor shall supply at acceptance a complete set of as built documents detailing the installed network and equipment to include:

- Training and operation manuals for all equipment provided.
- Block and level diagrams of the network.
- Cabling and termination demarcations.
- Plan and elevation drawings of all tower mounted equipment.
- Setup and alignment information.
- Successfully completed, signed and dated acceptance test plans.
- Hardware and software configuration settings.

9. Cutover requirements

- Contractor shall work with the existing radio system maintenance provider during the implementation and cutover, and shall correct any issues that occur immediately as not to disrupt radio traffic. The cost of this shall be the responsibility of the Contractor.
- Cutovers should be coordinated during non-peak radio traffic hours to minimize downtime. The cost of this shall be the responsibility of the Contractor.
- Brevard County requires continuity of the existing quality of service (QoS) and system functionality required by the 800 MHz EDACS Public Safety Radio System by and

throughout the installation and implementation of the new Project 25 (P25) solution. All equipment provided must be able to be integrated to the existing radio system and to be added to the Brevard County 800 MHz Maintenance Contract.

10. Acceptance testing requirements

Brevard County will work with the Contractor to develop a final Acceptance Test Plan (ATP) that is acceptable by both the Contractor and Brevard County, based on the submitted preliminary sample (Attachment D).

The Contractor's Engineer will execute the ATP with Brevard County personnel in attendance. Any testing completed without a Brevard County Emergency Management representative present will not be accepted.

11. System acceptance

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

- System installation completed.
- Final Inspection and punch list resolution.
- As Built documentation detailing the installed network, hardware and software configuration settings, and block and level diagrams of the network.
- Training and operation manuals for all equipment provided.
- Cabling and terminations demarcations and labeling designations.
- Plan and elevation drawings of any tower or shelter mounted equipment.
- Setup and alignment information.
- Successfully completed, signed and dated acceptance test plans.

12. Total cost of operation

If delays that are not associated with the Contractor's schedule, effort and control, affecting the Contractor's performance and schedule, the County and the Contractor are obligated to find a viable resolution to both parties.

Brevard County is not responsible for any additional charges or change orders during the implementation and buildout unless the Contractor can show compelling reasons why that cost was omitted from the Contract and why Brevard County should bear the cost of the omission.

Brevard County is not responsible for any additional charges unless agreed upon changes in scope of work or purchase orders have been issued by the County.

13. Scope of work

Contractor shall implement six channels per site over the duration of the Contract, utilizing existing frequencies/licenses, towers and backhaul connectivity. During that period the Contractor shall perform the following tasks and supply all the necessary equipment, materials, and labor:

A. Transition licenses and coordinate frequencies, as needed, to implement two (2) P25 Phase 2 Simulcast Systems as follows:

Table 1: North Simulcast System

SITE	ANTENNA STRUCTURE REGISTRATION NUMBER
SCOTTSMOOR	1289099
TITUSVILLE	1294915
SHARPES	NA
ROCKLEDGE	1307815
COCOA BEACH	1305363

Table 2: South Simulcast System

SITE	ANTENNA STRUCTURE REGISTRATION NUMBER
Melbourne	Owned by ATC
Palm Bay	1397419
Barefoot Bay	1289278
Indian Harbour Beach	1295508

B. Implement the North P25 Phase 2 Simulcast System with a redundant distributed control point.

C. Implement the South P25 Phase 2 Simulcast System with a redundant distributed control point.

D. Integrate the North P25 Phase 2 Simulcast System to the existing P25 VIDA switch without utilizing any type of Inter RF Subsystem Interface (ISSI) or gateway.

E. Integrate the South P25 Phase 2 Simulcast System to the existing P25 VIDA switch without utilizing any type of Inter RF Subsystem Interface (ISSI) or gateway.

F. Transition all the existing conventional channels from the EDACS Analog Switches (IMCs) to the VIDA core, supporting existing 4-wire audio and tone/E&M control.

At the end of the six (6) years Contract the network shall be composed of a three cell EDACS Simulcast System and a two cell P25 Simulcast System:

Existing System	**By 2026**
EDACS System: North Simulcast 14 Channels	**EDACS System:** North Simulcast 10 Channels

Existing System	By 2026
EDACS System: South Simulcast 20 Channels	**EDACS System:** South Simulcast 14 Channels
EDACS System: Beach Simulcast 12 Channels	**EDACS System:** Beach Simulcast 10 Channels
None	**P25 Phase 2 System:** North Simulcast 6 Channels
None	**P25 Phase 2 System:** North Simulcast 6 Channels

14. Network reliability

The Brevard County Public Safety Radio System shall remain fully functional during the installation of the network. Brevard County requires continuity of the existing quality of service (QoS) and system functionality required by the 800 MHz Public Safety EDACS Radio System by and throughout the installation and implementation of the new P25 solution. All equipment provided must be able to be integrated to the existing radio system and to be added to the Brevard County 800 MHz Maintenance Contract.

15. Network management system

The Contractor must integrate the P25 System to the existing Regional Network Manager (RNM). The existing RNM collects and displays status and performance information on all the devices and objects in the system. The RNM supports Simple Network Management Protocol (SNMP) therefore shall be configured so that alarms from the sites can be monitored and sent to a predetermined contact list.

16. Grounding and bonding requirements

As part of the work to be performed by the Contractor all equipment and all associated lines and hardware must designed and installed in compliance with grounding and installation standards Motorola R-56 or latest revision, Harris 4618/1 R3A or latest version, or MIL 188-124B.

17. Warranty and Maintenance Services

The manufacturer's warranty period shall be a minimum of 1 year starting on the day of the acceptance as defined by the implementation schedule. The Contractor shall resolve faults or malfunctions during the warranty period at no additional cost to the County.

ATTACHMENT B: PRICE SHEET

ITEM	DESCRIPTION	PRICE
1	**Transition all the existing conventional channels from the EDACS Analog Switches (IMCs) to the VIDA core.**	**$245,176.78**
2	**North Cell-Total:** 6 Channels 5 Sites P25 Phase 2 Simulcast System with a redundant distributed control point.	**$1,767,845.73**
2.1	6 channels P25 Phase 2 Site @ Scottsmoor	$315,381.83
2.2	6 channels P25 Phase 2 Site @ Titusville w/ Distributed Control Point	$435,850.12
2.3	6 channels P25 Phase 2 Site @ Sharpes	$315,381.83
2.4	6 channels P25 Phase 2 Site @ Rockledge w/Redundant Distributed Control Point	$385,850.12
2.5	6 channels P25 Phase 2 Site @ Cocoa Beach	$315,381.83
3	**North Cell-Total:** Additional expenditures and discounts	**$(303,194.16)**
3.1	Antenna System	$123,673.69
3.2	12 hours runtime DC Power Plant	$261,252.15
3.3	Discounts/Trade-ins	$(688,120.00)
3.4	Miscellaneous	$0
4	**North Cell:** Design, installation, tower work, project management, acceptance testing, engineering, licensing	**$417,567.00**
5	**South Cell-Total:** 6 Channels 4 Sites P25 Phase 2 Simulcast System with a redundant distributed control point.	**$1,452,463.90**
5.1	6 channels P25 Phase 2 Site @ Melbourne w/Redundant Distributed Control Point	$385,850.12
5.2	6 channels P25 Phase 2 Site @ Palm Bay w/ Distributed Control Point	$435,850.12

ITEM		DESCRIPTION	PRICE
	5.3	6 channels P25 Phase 2 Site @ Barefoot Bay	$315,381.83
	5.4	6 channels P25 Phase 2 Site @ Indian Harbour Beach	$315,381.83
6		**South Cell-Total:** Additional expenditures and discounts	**$(253,924.33)**
	6.1	Antenna System	$98,938.95
	6.2	12 hours runtime DC Power Plant	$209,011.72
	6.3	Discounts/Trade-ins	$(561,875.00)
	6.4	Miscellaneous	$0
7		**South Cell:** Design, installation, tower work, project management, acceptance testing, engineering, licensing	**$338,386.00**
8		**Bonding Costs**	**$27,000.00**
9		**TOTAL**	**$3,691,320.92**

ATTACHMENT C: SOFTWARE LICENSE AGREEMENT
Current Brevard VIDA 10A Licenses Owned by the County

Category	Option	Sales No.	Req No.	Issue Date	Product Name	Version	Qty
NSC	NA	NA	18663450	41900	HA, Hardware NSC	NS-SG2D	1
NSC	NA	NA	18663450	41900	Transcoder Talkpath	NA	5
NSC	NA	NA	18663450	41900	P25 Application	NS-SG2M	1
NSC	NA	NA	18663450	41900	License, VMWARE, FED	NS-SN2G	1
ISSI	NA	NA	18663450	41900	ISSI External System Connection	NM-SG9F	2
ISSI	NA	NA	18663450	41900	ISSI Gateway Talkpath	NM-SG9E	18
P25 Site	NA	NA	18663450	41900	P25 Site Talkpath	NS-SG2P	46
P25 Site	NA	NA	18663450	41900	P25 Site	NS-SG2N	9
Logging Recorder	NA	NA	18663450	41900	NSS, IP Logging REC. Talkpath	NS-SG7S	16
Logging Recorder	NA	NA	18663450	41900	NSS, IP Logging Recorder	NM-SG9D	11
Conventional	NA	NA	18663450	41900	Network First Application	NS-SG2F	1
Conventional	NA	NA	18663450	41900	Network First Talkpath	NS-SG2H	48
Conventional	NA	NA	18663450	41900	Network First Site	NS-SG2G	1
Device Manager	NM-SG9B	411211	NA	41869	Device Manager	Premium	3
BeOn	BM-PKGCL	411211	NA	41905	Package, 5 Beon User License	NA	15
BeOn	NS-PKGBN	411211	NA	41907	Package, Beon, Foundation, 10+ Users	NA	10
EMG	NA	NA	18663450	41900	License, EMG TalkPath 9-24	MS-SG1Y	20
EMG	NA	NA	18663450	41900	License, EMG TalkPath	MS-SG1W	20
IMC	NA	NA	18663450	41900	C3 Maestro IMBE P25 Vocoder		2
2 VIP	NA	NA	18663450	41900	License, VIP Console	NS-SG9G	2
2 VIP	NA	NA	18663450	41900	License, Console Talkpath	NS-SG2C	8
All Consoles	NA	NA	18663450	41900	License, Console	NS-SG2B	1
All Consoles	NA	NA	18663468	41912	License, Console Talkpath	NS-SG2C	328
All Consoles	NA	NA	18663468	41912	License, Console	NS-SG2B	41

***No additional licenses are required for this ITB.**

ATTACHMENT D: SAMPLE TEST AND ACCEPTANCE PLAN

COMMUNICATIONS INTERNATIONAL
An Employee Owned Company

Functional Test Procedures
For
Brevard County, FL
P25 South Simulcast System

Table of Contents

ABOUT THIS DOCUMENT

This document was specifically prepared for the customer shown below. Each section of this document is individually maintained in the Ci/Harris document control system.3333

Customer: Brevard County
Prepare by: Matthew St. Pierre and Joe Zrallack

DOCUMENT USAGE

Many of the tests in this document will need to be run on multiple pieces of equipment. For tests that need to be run multiple times, log in the comment section of the result box the identifier of the equipment tested. Although specific tests are not included relating to electrical measurements or timing parameters of equipment, these tests and levels are conducted and recorded as part of Ci/Harris' standard production and/or installation practices. These parameters include but are not limited to:

- Transmit Frequency and Deviation
- Output and Reflected Power
- Receiver Sensitivity
- Receiver Multicoupler Gain (if applicable)
- Receiver Preamplifier Gain (if applicable)
- Combiner Loss (if applicable)
- Audio line out
- Audio line in

SUBSCRIBER UNIT USAGE

All tests for subscriber (terminal) units in this document will be performed with Harris subscriber units unless the test setup identifies another Vendor's subscriber unit to be used.

1. CUSTOMER APPROVAL

These Test Procedures have been read and approved for use as the Functional System Acceptance Test.

Ci Representative:

Signature:

Date:

County Representative:

Signature:

Date:

2. BREVARD P25 SOUTH SYSTEM ACCEPTANCE

This Acceptance Test Procedure has been fully and successfully completed with all action items resolved.

Ci Representative:

Signature:

Date:

County Representative:

Signature:

Date:

3. Facility Test

3.1.1 Visual Inspection Barefoot Bay

Purpose: **Verify the system has been installed following Harris/Ci installation standards.**

Expected Results: **The installation should look clean and the documentation should reflect the installation.**

Setup:

None

Execution:

- ☐ Verify the area is clean and that all cabinets and racks are both clear of debris and clean.
- ☐ Verify all equipment racks are spaced per the drawings, secured and grounded.
- ☐ Verify all nameplates and labels are in place.
- ☐ Verify all protective foam, tape, and packing material has been removed.
- ☐ Verify all punchblocks are labeled.

Results (Pass/Fail):

Tester:

Date:

Comments:

3.1.2 Visual Inspection Palm Bay

Purpose: **Verify the system has been installed following Harris/Ci installation standards.**

Expected Results: **The installation should look clean and the documentation should reflect the installation.**

Setup:

None

Execution:

- ☐ Verify the area is clean and that all cabinets and racks are both clear of debris and clean.
- ☐ Verify all equipment racks are spaced per the drawings, secured and grounded.
- ☐ Verify all nameplates and labels are in place.
- ☐ Verify all protective foam, tape, and packing material has been removed.
- ☐ Verify all punchblocks are labeled.

Results (Pass/Fail):

Tester:

Date:

Comments:

3.1.3 Visual Inspection Melbourne

Purpose: **Verify the system has been installed following Harris/Ci installation standards.**

Expected Results: **The installation should look clean and the documentation should reflect the installation.**

Setup:

None

Execution:

- ☐ Verify the area is clean and that all cabinets and racks are both clear of debris and clean.
- ☐ Verify all equipment racks are spaced per the drawings, secured and grounded.
- ☐ Verify all nameplates and labels are in place.
- ☐ Verify all protective foam, tape, and packing material has been removed.
- ☐ Verify all punchblocks are labeled.

Results (Pass/Fail):

Tester:

Date:

Comments:

3.1.4 Visual Inspection Indian Harbour

Purpose: **Verify the system has been installed following Harris/Ci installation standards.**

Expected Results: **The installation should look clean and the documentation should reflect the installation.**

Setup:

None

Execution:

- ☐ Verify the area is clean and that all cabinets and racks are both clear of debris and clean.
- ☐ Verify all equipment racks are spaced per the drawings, secured and grounded.
- ☐ Verify all nameplates and labels are in place.
- ☐ Verify all protective foam, tape, and packing material has been removed.
- ☐ Verify all punchblocks are labeled.

Results (Pass/Fail):

Tester:

Date:

Comments:

3.2 Power Backup / UPS Verification

3.2.1 Power Backup / UPS Verification Barefoot Bay

Purpose: **To verify that the site can run on the UPS without interruptions per the required runtime.**

Expected Results: **Radio communication should not be interrupted during the transition.**

Setup: **Prior to the execution of this test, ensure any computers or other devices with volatile memory are backed up or are on power circuits not affected by this test.**

Notes: **Ci will perform this test at all locations. Ci is not responsible for test failures due to inadequate backup power equipment that is under the county's responsibility to provide. Any such failures of county provided backup power equipment will not delay system acceptance. Record in the comments section the names of locations tested and who has provided the backup power equipment (Ci or the county).**

Execution:

1. From the facility circuit breaker panel, disconnect main power.
   - ☐ Verify communication is uninterrupted.
2. After predetermined extent of designed backup power, reapply power.
   - ☐ Verify communication is uninterrupted.

Results (Pass/Fail):

Tester:

Date:

Comments:

3.2.2 Power Backup / UPS Verification Palm Bay

Purpose:	**To verify that the site can run on the UPS without interruptions per the required runtime.**
Expected Results:	**Radio communication should not be interrupted during the transition.**
Setup:	**Prior to the execution of this test, ensure any computers or other devices with volatile memory are backed up or are on power circuits not affected by this test.**
Notes:	**Ci will perform this test at all locations. Ci is not responsible for test failures due to inadequate backup power equipment that is under the county's responsibility to provide. Any such failures of county provided backup power equipment will not delay system acceptance. Record in the comments section the names of locations tested and who has provided the backup power equipment (Ci or the county).**

Execution:

1. From the facility circuit breaker panel, disconnect main power.
   - ☐ Verify communication is uninterrupted.
2. After predetermined extent of designed backup power, reapply power.
   - ☐ Verify communication is uninterrupted.

Results (Pass/Fail):

Tester:

Date:

Comments:

3.2.3 Power Backup / UPS Verification Melbourne

Purpose:	**To verify that the site can run on the UPS without interruptions per the required runtime.**
Expected Results:	**Radio communication should not be interrupted during the transition.**
Setup:	**Prior to the execution of this test, ensure any computers or other devices with volatile memory are backed up or are on power circuits not affected by this test.**
Notes:	**Ci will perform this test at all locations. Ci is not responsible for test failures due to inadequate backup power equipment that is under the county's responsibility to provide. Any such failures of county provided backup power equipment will not delay system acceptance. Record in the comments section the names of locations tested and who has provided the backup power equipment (Ci or the county).**

Execution:

1. From the facility circuit breaker panel, disconnect main power.
    - ☐ Verify communication is uninterrupted.
2. After predetermined extent of designed backup power, reapply power.
    - ☐ Verify communication is uninterrupted.

Results (Pass/Fail):

Tester:

Date:

Comments:

3.2.4 Power Backup / UPS Verification Indian Harbour

Purpose:	**To verify that the site can run on the UPS without interruptions per the required runtime.**
Expected Results:	**Radio communication should not be interrupted during the transition.**
Setup:	**Prior to the execution of this test, ensure any computers or other devices with volatile memory are backed up or are on power circuits not affected by this test.**
Notes:	**Ci will perform this test at all locations. Ci is not responsible for test failures due to inadequate backup power equipment that is under the county's responsibility to provide. Any such failures of county provided backup power equipment will not delay system acceptance. Record in the comments section the names of locations tested and who has provided the backup power equipment (Ci or the county).**

Execution:

1. From the facility circuit breaker panel, disconnect main power.
   - ☐ Verify communication is uninterrupted.
2. After predetermined extent of designed backup power, reapply power.
   - ☐ Verify communication is uninterrupted.

Results (Pass/Fail):

Tester:

Date:

Comments:

4. VIDA UNIVERSAL ADMINISTRATION SERVER (UAS)

4.1 Create an Agency Level Administrator Account in the UAS

Purpose: **Demonstrate the capabilitbility to create Agency Admin Accounts in the UAS.**

Expected Results: **This test will demonstrate that a UAS user has the ability to create a new UAS user account.**

Setup: **The user will need system level access to an UAS..**

Execution:

1. Browse to the UAS at the address of 'https://s0u1uas.vida.local:8443/nas'
2. Log in with UAS administrator level account.
   - ☐ Verify that default accounts are created (see list below) and verify a default agency administrative class exists by selecting System/Administration/Admin User.
3. Select "Add" to display the Administration User Detail screen.
4. Enter a name (e.g., TestUser) description, and password.
5. Select save to download, and click 'OK'
6. Log out of the default account.
7. Log in as the new TestAgencyAdmin
   - ☐ Verify access with TestAgencyAdmin
8. Log out of the Test AgencyAdmin.
9. Log in with the default account and delete the TestAgencyAdmin

Table 1: System users

Admin User	Admin Class	Description
agency998	Agency998	Agency 998 Access
Vida	RSA	RSA
ProvTool	RSA	Provtool
vida2	RSA	vida2
Hp	RSA	Hao for Testing
Provtool2	RSA	Provtool
Provtool3	RSA	Provtool
Provtool4	RSA	Provtool
Kc	RSA	Kc

Results (Pass/Fail):

Tester:

Date:

Comments:

4.2 Provision Agency with Talk Groups and Subscriber Units in the UAS

Purpose: **Demonstrate the capabilitability to add talk-groups and users to the Agency accounts in the UAS.**

Expected Results: **This test will show that a user can add a new talk group and users to the system.**

Setup: **System/Region/Agency level access to the UAS or a UAS client.**

Table 2: Test talk-groups

Name	Description	SPNI	Property Id	Priority Id
64000ALL	TG64000 P25	Full Rate All Call	1	3
64100ALL	TG64100 P25	Full Rate All Call	1	3
64101TCL	TG64101 P25	Full Rate Conf Med Priority	1	4
64102TCM	TG64102 P25	Full Rate Conf Med Priority	1	4
64103TCM	TG64103 P25	Full Rate Conf Med Priority	1	4
64104TCM	TG64104 P25	Full Rate Conf Med Priority	1	4
64105TCM	TG64105 P25	Full Rate Conf Med Priority	1	4
64106TCH	TG64106 P25	P25 Full Rate Conf High Priority	1	4

Table 3: Test radios

Description	RSI	Protocol Mask	Status	Sub Type	Assigned End User	Algorithm Support
Radio1	9980001	P25	Enabled Unit	Harris XG-75 Portable	010:998:0001	AES
Radio2	9980002	P25	Enabled Unit	Harris XG-75 Portable	010:998:0002	AES
Radio3	9980003	P25	Enabled Unit	Harris XG-75 Portable	010:998:0003	AES
Radio4	9980004	P25	Enabled Unit	Harris XG-75 Portable	010:998:0004	AES
Console9101	9989101	P25	Enabled Unit	Maestro Console	010:998:9101	AES
Radio5	9980005	P25	Enabled Unit	Harris XG-75 Portable	010:998:0005	AES
Radio6	9980006	P25	Enabled Unit	Harris XG-75 Portable	010:998:0006	AES
Radio7	9980007	P25	Enabled Unit	Harris XG-75 Portable	010:998:0007	AES
Radio8	9980008	P25	Enabled Unit	Harris XG-75 Portable	010:998:0008	AES
Radio9	9980009	P25	Enabled Unit	Harris XG-75 Portable	010:998:0009	AES
Radio10	9980010	P25	Enabled Unit	Harris XG-75 Portable	010:998:0010	AES

Execution:

1. Browse to the UAS at the address of 'https://s0u1uas.vida.local:8443/nas'
2. Log into the UAS with one of the default accounts.
3. Under agency 998 create a talk group by select 'R/W Talk Group' , select Agency/ "agency name"/ R/W Talk Group.
4. Click 'Add' and then on the Talkgroup Detail screen input the TG ID in the table below. All setting not listed use auto setting for setting not listed. Click OK and download.
   - ☐ Verify the talk group has been added to the list of Talkgroups.
5. Using Putty on an SMT log into one traffic controller at each control point for simulcast and each site for mulitsite and issue the command 'show gdb'.

- Verify that group 64454 exits in the traffic controllers data base.

6. Once the group has been verified, delete it from the UAS.

Table 4: Talk-group to be deleted

TG Id	Name	Description	SPNI	Property Id
64454	64454ANA	Half Rate Low Priority	1	3

Table 5: Priority settings

Prioriti Id	Coverage	Valid Coverage
5	P25Sites_PSAPs	P25Sites_PSAPs

Results (Pass/Fail):

Tester:

Date:

Comments:

4.3 Unit Deregistration

Purpose: **Demonstrate that Subscriber units will automatically deregister after a period of inactivity.**

Expected Results: **This test will show that inactive radios will not create traffic load demand.**

Setup: **Only the radio for this test should be on talk group TG64001 P25. All other radios should be on other talk groups or off.**

Table 6: Test console and radio

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG64001 P25	64001
Console 9101	9989101	TG64001 P25	64001

Execution:

1. PTT Console 9101 on TG64001 and verify it communicates on the system to Radio 1. Return call from Radio 1 to Console 9101 on TG64001.
2. Turn off radio 1 and wait for expiration of the radio timeout period.
3. PTT Console 9101 on talk group on TG64001
   - ☐ Verify no channels are brought up at the sites, because there is no demand for it at the sites.

Results (Pass/Fail):

Tester:

Date:

Comments:

4.4 Unit Enable/Disable from the UAS

Purpose: **Demonstrate the ability to disable a lost/stolen radio from the UAS.**

Expected Results: **This test will disable & re-enable a designated radio.**

Setup: **Obtain 2 radios switched to the same unencrypted group and note the IDs. Switch on the radios and ensure that they communicate. Verify all sites are connected to the NSC.**

Note: **The test will automatically delete the encryption key from the radio (if applicable). To restore unit encrypted functionality, the radio must have the key re-installed.**

Execution:

1. Select TG64001 P25 on both radios
   - ☐ Verify that the radios can communicate.
2. From the UAS:
   a. Click UNIT 9880004 ENABLE/DISABLE.
   b. Under the UNIT Enable/Disable tab, enter the ID of radio 1 to be modified.
   c. Select the DISABLE button and check the status.
   - ☐ Attempt to PTT Radio 9880004 and verify that it will not communicate with the other encrypted radios.
   - ☐ PTT radio 9880001 and verify that radio 9880005 cannot receive the call.
3. Enable the ID of radio 9880005.
   - ☐ Verify that the Enable/Disable screen indicates that the Current State of the radio is Enabled.
   - ☐ Confirm that the radios can communicate in unencrypted mode.
4. Switch off radio 9880005 and disable it from the Enable/Disable screen.
   - ☐ Verify that the desired state is Disabled and the Current State is Enabled.
   - ☐ Switch on the radio and verify that, it becomes disabled.
   - ☐ Verify that the State settings change to Disabled and that the radios cannot communicate.
5. Enable the radios
   - ☐ Verify that radios can communicate in unencrypted mode.

Results (Pass/Fail):

Tester:

Date:

Comments:

5. Wide Area Network

5.1 UAS Site Access Control for Invalid User ID

Purpose: This test will demonstrate access control for Subscriber units with invalid radio IDs and High Availability of the RSM.

Expected Results: This test will deny a radio with an invalid Subscriber ID access to the system. Once the radio is added to the system the primary RSM will download it to the sites and allow the radio access. When the primary RSM is turned off and the radio is deleted from the UAS the secondary RSM will delete the radio from the system. Once the radio is deleted from the system the radio will again be denied access.

Setup: Use the table below to set up the new radio in the UAS

Table 7: Voice-end users

User Id	Name	Description	Personality	User Privilege	Enable P25 AES OTAR	Manually-Keyed	P25 Voice Auth	Preferred Vocoder
010:998:9150	Rad9150	Radio9150	Pers1	998_10_supervisor	FALSE	FALSE	FALSE	P25 Full Rate
OS Voice Auth	**Transc Allowed Flag**							
FALSE	TRUE							

Table 8: Test radio set up

Description	RSI	Electronic Serial Number	Protocol Mask	Status	Sub Type	Assigned End User	Algorithm Support
Radio9150	99899150	109989150	P25	Enabled Unit	Harris XG-75 Portable	010:998:9105	AES

Execution:

1. Login into a site traffic controller issue a "show udb 109989150
   - ☐ Verify the radio is not present in the traffic controller database
2. Program Radio 9801 with an ID 9989150.
3. Attempt to PTT Radio 9150.
   - ☐ Verify access to the site is denied and audio is not heard on Radio 2.
   - ☐ Verify the system is still functional by PTT Radio 2 and verify the audio is heard on Radio 3.
4. Use the supplied table to enter radio 109989150 in to the UAS database.
   a. Select Agency/"agency name"/Voice End User. Click Add Entry and then on the End User Detail screen input the User ID, password ("p25user"), Name, Description, etc. of the user. Click OK and download.
      - ☐ Verify the user ID has been added to the list of users
   b. Select Agency/"agency name"/Subscriber Unit and enter the appropriate User ID, IP Address, and ESN for the user created in step 7. Click OK and download.
5. Loin into a site traffic controller issue a "show udb 109989150
   - ☐ Verify the radio is now present in the traffic controller database
6. Key radio 9150
   - ☐ Verify access to the site is permitted and audio is heard on radio.
7. Restart radio 9150 and PTT the radio
   - ☐ Verify access to the site is permitted and audio is heard on radio 9012.
8. Delete 10998999150 from the UAS database
9. Key radio 9150 from UAS
   - ☐ Verify access to the site is not permitted and audio is not heard.

Results (Pass/Fail):

Tester:

Date:

Comments:

5.2 Site Activity using the Activity Warehouse

Purpose: **Demonstrate the capability to create various Agency level system usage reports.**

Expected Results: **This test will create an Agency level user reports.**

Setup: **Ensure radio traffic has occurred across the network recently. If necessary or desired, place some calls with a known radio ID on multisite talk groups prior to running the test for reference during the test.**

Execution:

1. Log into the SMT PC as a System level administrator.
2. Open Internet Explorer and Browse to 'https://*'hosFLame of RSM'*/reports' and log in with active directory credentials.
3. Select 'Call Activity' enter the time to run the report for two hours before this test.
4. Enter additional report information required.
5. Click on "View Report"
   - ☐ Check to make sure that there is call activity. These reports can be up to 2 hours behind.

Results (Pass/Fail):

Tester:

Date:

Comments:

5.3 VIDA REGIONAL NETWORK MANAGER (RNM)

Purpose: **Demonstrate the capability to monitor real-time call activity from the RNM.**

Expected Results: **This test will show active call traffic on specific talk groups and SIDs.**

Setup: **Administrator access to the RNM.**

Execution:

1. On a client computer, open the windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with an Active Directory account.
2. Choose the system map and select the 'Launch Application' button.
3. Open the Realtime tab and Click Site Calls.
4. Select the site and expand.
5. Check the box next to the channels and select to add the channels to the target list. Select the 'ok' button to launch the application.
6. Place a group call from Radio 1 to Radio 2 on the site.
   - ☐ Verify that the event viewer displays the talkgroup ID and calling party ID.
   - ☐ Verify the state changes from Free to Talk.
   - ☐ Verify the TG Alias displays the Group Number.

Results (Pass/Fail):

Tester:

Date:

Comments:

5.4 RF System Alarms Indications are reported to the RNM

Purpose: **Demonstrate the capability to monitor system faults & alarms at the RNM.**

Expected Results: **System level equipment will indicate faults & alarms at the RNM.**

Setup: **Access to the site under test and the regional RNM. The alarm will need to be generated by equipment being physically powered-down. Note the time of the alarm condition for later tests. Call up the RNM Domain screen and verify that all map icons are either green or blue. On the Fault Browser screen delete any prior alarms. Internal Note: Ci should create a comprehensive table of specific system alarms to verify.**

Execution:

1. On a client computer, open the windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with an Active Directory account.
2. Choose the system map and select the 'Launch Application' button.
3. Select the 'Network' tab and expand the tree in the left-hand panel until you can see a site in the right-hand panel.
4. Generate an alarm on a device (see chart) by powering down or otherwise disabling the device.
   - ☐ Verify that the RNM indicates a site alarm for the affected device.
5. Turn the device back ON.
   - ☐ Verify that the device alarm clears and displays green.
6. Review alarm details by performing a Right Mouse Click on an Object. Select the desired menu option.
7. Repeat steps 1-4 for all equipment listed in the below chart.
8. Substitute https://s0u2rnm.vida.local/nmc and repeat test steps 1-5 for the second RNM.

Record the results below for each site. (Note: This form can be modified to reflect actual as-built alarms.

Table 9: Alarm status

Tester:		Results:	Date:	
Alarm #	Name	Pass/Fail	Remarks	
1	Traffic Controller			
2	Router			
3	Switch			
4	Network Sentry			

Results (Pass/Fail):

Tester:

Date:

Comments:

5.5 Network Sentry Site Alarm Indications are reported to the RNM

Purpose: **Demonstrate the capability to monitor site faults & alarms at the RNM.**

Expected Results: **Site level equipment will indicate faults & alarms at the RNM.**

Setup: **This test verifies that the Site & Shelter Alarms are connected to the new system and alarm names are programmed to show the alarm types and locations. Site-specific digital alarm inputs connected to the alarm management system (NetGuardian or Network Sentry) alarm unit. Internal Note: This is a field test. Should we configure a single simple site alarm for general test purposes?**

Execution:

1. On a client computer, open the windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with the Active Directory account.
2. Choose the system map and select the 'Launch Application' button.
3. Select the 'Network' tab and expand the tree in the left-hand panel until you can see a site in the right-hand panel.
4. Select a physical site to test alarm inputs.
5. Create a condition that will either simulate an alarm (jumper alarm contacts) or the actual event to trigger each alarm
   - ☐ Verify that the alarm is detected and displayed in the RNM Network Viewer and is listed in the Fault Browser
6. Clear the alarm condition
   - ☐ Observe that the alarm indication has cleared in both the Network Viewer and the Fault Browser
7. Repeat for each alarm and for each site in the system
8. Record the results below for each site. (Note; This form can be modified to reflect actual as-built alarms).

Table 10: Alarms status

Site #:			Site Name	
Tester:		Results:	Date:	
Alarm #	Name	Pass/Fail	Remarks	
1	Door			
2	Smoke Detector			
3	Heat Detector			
4	Building Low Temp			
5	Building High Temp			
6	Main Power Fail			
7	ATS Normal			
8	ATS Emergency			
9	Generator Low Oil			
10	Generator Over Temp			
11	Generator Over Crank			
12	ACH1 L.O.			
13	ACH2 L.O.			
14	Surge Arrestor 1			
15	Surge Arrestor 2			
16	Multicoupler Top			
17	Multicoupler Bottom			

Results (Pass/Fail):

Tester:

Date:

Comments:

6. P25 TRUNKED CALLS AND SITE FEATURES

Purpose: **These tests will verify that the site can provide radio communications at the site level.**

Expected Results: **These tests will demonstrate that the site can provide communications for radios.**

Setup: **All tests in this section assume that the UAS setup matches the configuration in this test. All testing in this section is to be done with phase 1 radios.**

6.1 Transmit Grant Tone

Purpose: **Demonstrate the system channel grant tone is heard on the radio.**

Expected Results: **This test will show that the radio will play a grant tone when the radio is assigned a working channel.**

Setup: **One radio with valid ID and a valid group on selected system. Grant tone (Ready to Talk tone) enabled in radio personality as applicable for specific radio type being tested.**

Execution:

1. Press PTT button on radio with valid group selected.
2. Verify grant tone is heard at radio when working channel access is granted.

Note: If the call is queued, the grant tone will be delayed until the call is assigned a working channel.

Results (Pass/Fail):

Tester:

Date:

Comments:

6.2 Transmission Trunking

Purpose: **This test will demonstrate that the system is working as a transmission trunking system.**

Expected Results: **The tests verify that the Control Channel will assign a working channel to the radio and that the radio and site will work as a trunking set.**

Setup: **Radio 1, 2, and 3 should be the only radios on the system.**

Table 11: Test radio setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64001 P25	64001
Radio 3	998003	TG64001 P25	64001

Execution:

1. PTT Radio 1 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Verify the number of the channel assigned.
2. PTT Radio 2 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 2.
   - ☐ Verify the next channel is assigned.
3. PTT Radio 3 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 3.
   - ☐ Verify the next channel is assigned.

Results (Pass/Fail):

Tester:

Date:

Comments:

6.3 Message Trunking on Phase 1

Purpose: **This test will demonstrate that the system can work as a message trunking system.**

Expected Results: **This test will verify that the system will assign the same working channel to a message trunking call as long as the next call happens with in the message trunking timer. This allow the channel to be held for important messages. This test also confirms that in Phase 1 mode the radio returns to the control channel to get reassigned to the same channel.**

Setup: **No other radios should be on the system. Each call needs to happen within 3 seconds of each other for this test to work. If there are no talk groups setup in the UAS that are Message Trunked this will need to be fixed before this test can be run.**

Table 12: Test radio setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64003
Radio 2	998002	TG64001 P25	64003
Radio 3	998003	TG64001 P25	64003

Execution:

1. PTT Radio 1 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Verify the number of the channel assigned.
   - ☐ Verify the light on the radio is green indicating the radio is on the working channel.
2. Un-PTT Radio 1.
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Verify the light on the radio goes dark indicating the radio is back on the control channel.
3. PTT Radio 2 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 2.

- ☐ Verify the same channel is assigned in step 1.
- ☐ Verify the light on the radio is green indicating the radio is on the working channel.

4. Un-PTT Radio 2
   - ☐ The transmit (TX) indicators should turn on at Radio 2.
   - ☐ Verify the light on the radio goes dark indicating the radio is back on the control channel.
5. PTT Radio 3 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 3.
   - ☐ Verify the same channel is assigned in step 1, and 3.
   - ☐ Verify the light on the radio is green indicating the radio is on the working channel
6. Un-PTT Radio 3
   - ☐ The transmit (TX) indicators should turn on at Radio 3.
   - ☐ Verify the number of the channel assigned.
   - ☐ Verify the light on the radio goes dark indicating the radio is back on the control channel

Results (Pass/Fail):

Tester:

Date:

Comments:

6.4 Message Trunking on Phase 2

Purpose: **This test will demonstrate that the system can work as a message trunking system.**

Expected Results: **This test will verify that the system will assign the same working channel to a message trunking call as long as the next call happens with in the message trunking timer. This allow the channel to be held for important messages. This test also confirms that in Phase 2 mode the radio stays on the working channel and is reassigned the same channel.**

Setup: **No other radios should be on the system. Each call needs to happen within 3 seconds of each other for this test to work. If there are no talk groups setup in the UAS that are Message Trunked this will need to be fixed before this test can be run.**

Table 13: Test radio setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64003
Radio 2	998002	TG64001 P25	64003
Radio 3	998003	TG64001 P25	64003

Execution:

7. PTT Radio 1 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Verify the number of the channel assigned.
   - ☐ Verify the light on the radio is green indicating the radio is on the working channel
8. Un-PTT Radio 1
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Verify the light on the radio stays green indicating the radio is back on the control channel.
9. PTT Radio 2 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 2.
   - ☐ Verify the same channel is assigned in step 1.

- ☐ Verify the light on the radio is green indicating the radio is on the working channel.

10. Un-PTT Radio 2
    - ☐ The transmit (TX) indicators should turn on at Radio 2.
    - ☐ Verify the light on the radio stays green indicating the radio is back on the control channel
11. PTT Radio 3 and talk.
    - ☐ The transmit (TX) indicators should turn on at Radio 3.
    - ☐ Verify the same channel is assigned in step 1, & 3.
    - ☐ Verify the light on the radio is green indicating the radio is on the working channel
12. Un-PTT Radio 3
    - ☐ The transmit (TX) indicators should turn on at Radio 3.
    - ☐ Verify the number of the channel assigned.
    - ☐ Verify the light on the radio stays green indicating the radio is back on the control channel

Results (Pass/Fail):

Tester:

Date:

Comments:

6.5 Group Test Call (Clear Voice and Encrypted Voice)

Purpose: **The Group Test Call will show that the site will allow a radio to communicate using a group call**

Expected Results: **The test will demonstrate that all radios assigned to a common group will hear a call and all radios assigned to an uncommon group will not hear the call**

Setup: **Set Radios 1, 2, and 3 to (Group A) per test group structure. Make sure Scan is turned OFF. All radios should not be in encrypted mode but have encryption keys.**

Table 14: Test radio setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	Encrypted
Radio 1	998001	TG64001 P25	64001	N
Radio 2	998002	TG64001 P25	64001	N
Radio 3	998003	TG64001 P25	64001	N
Radio 4	998004	TG64002 P25	64002	Y
Radio 5	998005	TG64002 P25	64002	Y
Radio 6	998006	TG64002 P25	64002	Y

Execution:

1. PTT Radio 1 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Audio should be heard in Radios 2 and 3.
   - ☐ The ID of Radio 1 should be seen on Radios 2 and 3.
2. Set Radio 3 to (TG64002 P25). PTT on Radio 1 and talk.
   - ☐ The transmit (TX) indicators should turn on at Radio 1.
   - ☐ Audio should be heard in Radio 2 only.
   - ☐ The ID of Radio 1 should be seen at Radio 2 only.

Repeat sets 1-4 for encrypted mode

Results (Pass/Fail):

Tester:

Date:

Comments:

6.6 Emergency Group Call

Purpose: **Demonstrate the capability of the system to process an emergency group call**

Expected Results: **This test will verify that when a radio indicates an emergency group call. All other radios in the group indicate an emergency and the emergency can be cleared by an administrator radio.**

Setup: **Program 3 Radios with the same emergency home group. Set the supervisor radio (Radio 1) and Radio 2 to the home group. Set Radio 3 to a different group (not home group).**

Execution:

1. Press the Emergency call button on Radio 1 and talk within the pre-defined Emergency Auto-key time, and/or PTT Radio 1 during or just after that time.
   - ☐ Verify that Radio 1 indicates the "TX EMER" declaration and that it reverts to the home group.
   - ☐ Verify that Radio 2 indicate a "RX EMER" message and hears audio on the emergency home group.
   - ☐ Verify that Radio 3 does not receive the emergency call.
2. Clear the emergency with the Supervisor Radio (Radio 1).
   - ☐ Verify the emergency clears in the radios.
3. Repeat the previous steps for encrypted voice.

Results (Pass/Fail):

Tester:

Date:

Comments:

6.7 System All Call

Purpose: **Demonstrate the capability of the system to route a call to all radios on the system.**

Expected Results: **This test will demonstrate the system's ability to route a single call to all available radios on the system.**

Setup:

Table 15: Test radio setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64000 P25	64000
Radio 2	998002	TG64001 P25	64101
Radio 3	998003	TG64002 P25	64102

Execution:

1. With Radio 1 place an Individual call to talk group 64000 (All Call Talk Group)
   - Audio should be heard at Radios 2 and 3.
2. Repeat the previous steps for encrypted voice, if applicable.

Results (Pass/Fail):

Tester:

Date:

Comments:

6.8 Transmit Denied (for Invalid radio ID)

Purpose: **This test is set up to demonstrate that a radio can be denied transmission on a site**

Expected Results: **This test will verify the system's ability to deny a radio to transmit on one site and allow the radio to work on a different site.**

Setup: **Program system so that radio ID is not valid on the site under test. Download database to site.**

Execution:

1. Program Radio 1 with an invalid ID
2. PTT Radio 1
   - ☐ Verify the radio is prohibited access to system.
3. Reprogram the radio to the original personality.

Results (Pass/Fail):

Tester:

Date:

Comments:

6.9 Call Queue Declaration Alert

Purpose: **This test will demonstrate the system queuing.**

Expected Results: **This test will verify that the system will assign users in a queue when the system has no available channels and assign users a working channel when the system has an available channel.**

Setup: **This test requires four radios and two working channels. Disable channels (if necessary) until there are two working channels at the site. This test is to be run with no other users on the system.**

Execution:

1. Busy up all talk paths on the system with radio 1, and 2 by pressing and holding the PTT button.
2. With all talk paths busied, momentarily press and release the PTT button on test Radio 3
   - ☐ Verify that a Call Queued tone is heard at the radio.
3. Unkey (release PTT button) radio 2.
   - ☐ Verify that Radio 3 is assigned to the free talk path.
4. The grant tone is heard at the radio, without having to rekey the radio (repressing the PTT button).
5. Press the PTT button on Radio 3 within the auto key time applicable to the radio type (approx. 2 seconds) to keep the assigned channel.
   - ☐ Verify that audio from Radio 3 is heard at Radio 4.
6. Unkey all radios.

Results (Pass/Fail):

Tester:

Date:

Comments:

6.10 Call Priority for Group IDs

Purpose: **This test is set up to demonstrate the system's ability to allow a user with a higher priority to get assigned a channel before a user with a lower priority despite who enter the queue first.**

Expected Results: **This test will verify that a user that has a higher priority will get assigned a channel before users with a lower priority regardless of who entered the queue first. In this test radio, four should get the first available channel, because it has a higher priority, and radio 3 will get assigned a channel next because it has a lower priority.**

Setup: **This test requires two working channels on the site. Disable channels (if necessary) until there are two working channels on the site. Setup the radio according to the table below. This test is to be run with no other users on the system.**

Table 16: Test radio setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG64001 P25	64001
Radio 2	9980002	TG64002 P25	64002
Radio 3	9980003	TG64004 P25	64003
Radio 4	9980004	TG64003 P25	64004

Execution:

1. PTT Radios 2 and 4 and hold on transmit to busy both working channels.
2. PTT and release Radio 1 (medium priority entry into the queue).
3. PTT and release Radio 3 (high priority entry into the queue).
4. Un-key Radio 4
   - ☐ Verify that Radio three un-queues and keys.
5. Un-key Radio 2
   - ☐ Verify that Radio one un-queues and keys.
6. Un-key all radios.

Results (Pass/Fail):

Tester:

Date:

Comments:

6.11 Emergency Call Priority for Group IDs

Purpose: **This test is set up to demonstrate the system's ability to allow a user that declare an emergency to be assigned a channel before other users despite queue entry sequence or priority level.**

Expected Results: **This test will verify that radio 1 is assigned a channel before radio 2 despite the fact that radio 2 has a higher priority and entered the queue first.**

Setup: **This test requires four radios and two working channels on the site. Disable channels (if necessary) until there is only two working channels on the site.**

Execution:

1. PTT Radios 4 and 3 and hold on transmit to busy both working channels.
2. PTT and release Radio 2 (high priority entry into the queue).
3. Declare an emergency on Radio 1 (medium priority entry into the queue but now at Emergency Priority).
4. Un-key Radio 4
   - ☐ Verify that Radio one un-queues and is assigned a channel without having to PTT. (Key the radio within the specified auto key time in order to keep the channel.)
5. Un-key all radios and clear the emergency with the Radio 1.

Results (Pass/Fail):

Tester:

Date:

Comments:

6.12 Group Scan

Purpose: **This test will demonstrate the radios ability to scan different talk groups.**

Expected Results: **in this test, the radio will play calls from multiple talk groups while scan is enabled**

Setup: **All radios for this test need to have scan ability. Radio 1 set up with TG64001 P25 and TG64002 P25 in the scan list, TG64001 P25 selected, and group scan initially disabled.**

Table 17: Test radio setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64002 P25	64001

Execution:

1. Place a call from Radio 2 on talk TG64001 P25.
   - ☐ Verify the call is received and audio is heard on Radio 1.
2. Place a call from Radio 2 on talk TG64002 P25.
   - ☐ Verify the call is not received by Radio 1.
3. Enable group scan on Radio 1.
4. Place another call from Radio 2 on talk TG64002 P25.
   - ☐ Verify that the call is now received and audio is heard on Radio 1.

Results (Pass/Fail):

Tester:

Date:

Comments:

6.13 Priority Scan

Purpose: **This test will demonstrate the radios ability to set up scans lists with different levels of priorities.**

Expected Results: **in this test, the radio will play calls with a higher level of priority.**

Setup: **Set Radio 1 to priority scan TG641001 P25 and scan (at lower priority – 3 bars) TG641002 P25. Set radio 1 to Group C. Have scan enabled on radio 1.**

Table 18: Test radio setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64002 P25	64002
Radio 3	998003	TG64003 P25	64001

Execution:

1. Place a call from Radio 2 on TG641002 P25; hold the call until the end of this test.
   - ☐ Verify Radio 1 scans to TG64002 P25 and hears audio from Radio 2.
2. Place a call from Radio 3 on TG64001 P25.
   - ☐ Verify Radio 1 priority scans to TG641001 P25 and hears audio from Radio 3.
3. Turn off scan on all radios.

Results (Pass/Fail):

Tester:

Date:

Comments:

6.14 Transmit Busy Lockout

Purpose: **This test is setup to demonstrate that a radio cannot transmit on a talk group while a different radio is transmitting on the same talk group.**

Expected Results: **This test will show that a radio will not be allowed to transmit on a talk group while a different radio is transmitting on the same talk group.**

Setup: **Talk group used for test must be set up as transmission trunked. This feature does not apply to message trunked calls.**

Table 19: Test radio setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64002 P25	64001

Execution:

1. Place a call from Radio 1 on selected talk group by pressing and holding the PTT button.
   - ☐ Verify the call is received and audio is heard on Radio 2.
2. While the call is in progress, press the PTT button on Radio 2.
   - ☐ Verify that Radio 2 does not transmit over (step on) the call in progress.

Results (Pass/Fail):

Tester:

Date:

Comments:

6.15 Continuous Control Channel Update

Purpose: **This test will demonstrate that a radio will join a call that is already in progress**

Expected Results: **This test will verify that a radio will join a call that is already in progress.**

Setup:

Table 20: Test radio setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64002 P25	64001

Execution:

1. Set both radios to the test group.
2. Turn radio 2 OFF.
3. Key radio 1 and hold. Turn ON the radio 2 (and set it to the test group if necessary).
   - ☐ Verify that the second radio joins the call in progress and hears audio from the call in progress.
4. Unkey radio 1.

Results (Pass/Fail):

Tester:

Date:

Comments:

6.16 Convert To Callee

Purpose: **This test will demonstrate that the site will only allow one radio to transmit on a talk group.**

Expected Results: **The test will verify that a site will only allow one radio to transmit on a talk group**

Setup: **Radio 1 and Radio 2 should be on the same site.**

Table 21: Test radio setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64002 P25	64001

Execution:

1. Set two radios to the same site and group.
2. Key both radios at the same time.
   - ☐ Verify that one radio ends up transmitting and the other ends up receiving.
   - ☐ Verify that the call audio is routed.

Results (Pass/Fail):

Tester:

Date:

Comments:

6.17 Site Trunking (Failsoft) Indication

Purpose: **This test will demonstrate that radio will display a symbol when the site it is logged into is not connected to the system.**

Expected Results: **This test will verify that the radio will display an 'F' when the site it is logged into is not connected to the system.**

Setup:

Table 22: Test radio setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	Site #
Radio 1	998001	TG64001 P25	64001	1
Radio 2	998002	TG64002 P25	64002	1
Radio 3	998003	TG64003 P25	64001	2

Execution:

1. PTT Radio 1
   - ☐ Verify that the Radio 1, Radio 2, and Radio 3 can communicate on the system.
2. Disconnect the network connection from the Network Switching Center to the Site Router, causing loss of communication from the site back to the Network Switching Center.
   - ☐ Verify that Radio 1 and Radio 2 indicate a Failsoft alarm ("F") on their displays this may take several minutes.
3. PTT Radio 1 on Talkgroup A. Verify audio is heard at Radio 2. Verify audio is not heard on Radio 3.
4. Re-connect the network from the Network Switching Center to the Site Router.
   - ☐ Verify the Failsoft alarm disappears on the radios and that communications with Radio 3 is reestablished.

Results (Pass/Fail):

Tester:

Date:

Comments:

7. TRANSCODER TEST

Purpose: **This test will demonstrate the transcoder ability to transcode calls made with different vocoders**

Expected Results: **This test will verify that the transcoder is needed to transcode a call, and each transcoder will transcode calls.**

Setup:

Table 23: Test console and radio setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	9980001	TG 64400OS	64400
Console 9110	9989110	TG 64400OS	64400

Execution:

1. Shutdown s0u1xcda.vida.local, s0u2xcda.vida.local and s0u1xcdb.vida.local.

Table 24: Transcoder status

Transcoder	State
s0u1xcda.vida.local	Off
s0u2xcda.vida.local	Off
s0u1xcdb.vida.local	Off

2. From the console place a call on talk group 64400OS
   - ☐ Verify that the call is not heard on a P25 radio on talk group 6400OS, this called failed because there is no working transcoder.
3. Restart s0u1xcda.vida.local.

Table 25: Transcoder status

Transcoder	State
s0u1xcda.vida.local	On
s0u2xcda.vida.local	On
s0u1xcdb.vida.local	On

4. From the console place a call on talk group 64400OS
   - ☐ Verify that the call is heard on a P25 radio
5. Restart s0u2xcda.vida.local wait for 15 minutes for services to start
6. Shutdown s0u1xcda.vida.local.

Table 26: Transcoder status

Transcoder	State
s0u1xcda.vida.local	Off
s0u2xcda.vida.local	On
s0u1xcdb.vida.local	Off

7. From the console place a call on talk group 64400OS
   - ☐ Verify that the call is heard on a P25 radio on talk group 6400OS this call is using s0u2xcda.vida.local.
8. Restart s0u1xcdb.vida.local
9. Shutdown s0u1xcda.vida.local

Table 27: Transcoder status

Transcoder	State
s0u1xcda.vida.local	Off
s0u2xcda.vida.local	Off
s0u1xcdb.vida.local	On

10. From the console place a call on talk group 64400OS
    - ☐ Verify that the call is heard on a P25 radio on talk group 6400OS this call is using s0u3xcda.vida.local.
11. Restart s0u2xcda.vida.local and s0u1xcda.vida.local
12. From the console place a call on talk group 64400OS verify that the call is heard on a P25 radio on talk group 6400OS

Table 28: Transcoder status

Transcoder	State
s0u1xcda.vida.local	On
s0u2xcda.vida.local	On
s0u1xcdb.vida.local	On

Results (Pass/Fail):

Tester:

Date:

Comments:

8. P25 PHASE 2 FUNCTIONALITY (Single Site/Simulcast Single Site)

Purpose: The tests below verify that the P25 Phase 2 implementation provides the additional traffic channel capacity and features of P25 Phase 2 while allowing backwards compatibility with Phase 1 radios and talkgroups.

Expected Results: This will verify that a P25 Phase 1 call will work on a Phase 2 system

Setup: In the following tests, portables 1 and 2 will be set up as Phase 1 only. Portables 3 and 4 will be set up as Phase 2 and Phase 1 capable, depending upon talk-group. FDMA refers to Phase 1 and TDMA refers to Phase 2. Start a session on the RNM and setup to watch channel assignments using the real time viewer function.

On a client computer, open the windows internet explorer and browse to https://s0u1rnm.vida.local/nmc and log in with an Active Directory account. Choose the system map and select the 'Launch Application' button. Open the Realtime tab and Click Site Calls. Select the site and expand. Check the box next to the channels and select the option 'to add the channels to the target list'. Select the 'ok' button to launch the application. Place a group call from Radio 1 to Radio 2 on the site, and verify that the event viewer displays the talkgroup ID and calling party ID. Verify the state changes from Free to Talk. Verify the TG Alias displays the Group #.

Table 29: Test radio setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID	System
Radio 1	998001	TG64051 P25	64051	MAC PH 1
Radio 2	998002	TG64051 P25	64051	MAC PH 1
Radio 3	998003	TG64051 P25	64051	MAC PH 2
Radio 4	998004	TG64051 P25	64051	MAC PH 2

8.1 Mixed Mode site to Mixed Mode site Call Phase 1- Phase 1

Purpose: **Demonstrates that a Phase 1 call will work on a Phase 2 system**

Expected Results: **This will verify that a P25 Phase 1 call will work on a Phase 2 system**

Setup: **Turn off radios 3 and 4.**

Execution:

1. PTT Radio 1 and talk. The transmit (TX) indicators should turn on at Radio 1
   - ☐ Verify that the call is assigned as an FDMA by viewing the Real Time Viewer Site Activity on the RNM.
   - ☐ Verify Radios 2 can hear Radio 1.

Results (Pass/Fail):

Tester:

Date:

Comments:

8.2 Mixed Mode site to Mixed Mode site Call - Phase 1 and Phase 2

Purpose: **Demonstrates that a mixed mode call can function on a Phase 2 system**

Expected Results: **This test will verify that a Phase 2 radio will hear a call from a Phase 1 radio.**

Setup: **Turn on Radios 1, 2, 3, 4**

Execution:

1. PTT Radio 1 and talk. The transmit (TX) indicators should turn on at Radio 1
   - ☐ Verify that the call is assigned as an FDMA by viewing the Real Time Viewer Site Activity on the RNM.
   - ☐ Verify Radios 2, 3 and 4 can hear Radio 1.

Results (Pass/Fail):

Tester:

Date:

Comments:

9. SYMPHONY DISPATCH FEATURE SET

All Testing done in this section should be completed with a user that is in the 'Console' User Group.

9.1 Transmitting With a Microphone (Group Calls, I Calls)

Purpose: **Confirms the console operator can initiate communication with a terminal radio using the console select functions and foot pedal, for both Group and I Calls.**

Expected Results: **Confirms communication with the terminal radio**

Setup: **Radio set to TG64001 P25 and console programmed with talk groupTG64001 P25**

Execution:

1. Press the INSTANT TX function (for example right mouse button) on the module with the test group. Verify
   - ☐ a channel access tone is heard, a
   - ☐ ripple effect on the 'TX' indicator is displayed
   - ☐ the call is heard on the radio.
2. Release the Instant TX key
3. Right click on the gear symbol for TG64002 and select 'Select' to make TG64002 the selected talk group. Verify
   - ☐ that the module for TG64002 is highlighted indicating that it is the selected talk group
   - ☐ the module at the top center of the screen changes to 'TG64002'
4. Make call on 64002TG by:
   a. Press the PTT foot pedal.
      - ☐ verify that a channel access tone is heard,
      - ☐ the halo around the 'TX' indicator is displayed
      - ☐ that the call is heard on the radio
      - ☐ verify audio is head at a radio on talk group 64002TG
      - ☐ Release the foot pedal to end the call

   b. Press the headset button.
      - ☐ verify that a channel access tone is heard
      - ☐ the halo around the 'TX' indicator is displayed
      - ☐ that the call is heard on the radio

- ☐ verify audio is head at a radio on talk group 64002TG
- ☐ Release the headset button to end the call.

c. Select the 64002TG button with the mouse.
   - ☐ verify that a channel access tone is heard
   - ☐ the halo around the 'TX' indicator is displayed
   - ☐ that the call is heard on the radio
   - ☐ verify audio is head at a radio on talk group 64002TG
   - ☐ Release the mouse button to end the call.

Results (Pass/Fail):

Tester:

Date:

Comments:

9.2 Receiving Calls (Unit ID Display, Talk group ID Display, Aliasing)

Purpose: **Confirm the console operator can receive communications from a terminal radio, using both talkgroup and individual calling.**

Expected Results: **Communications are initiated and received on the appropriate speaker (select or unselect) and the radio's ID is displayed.**

Setup: **Console should have talk groups 64001TU and 64002TU programmed with 64002TU selected and Radio set to TG64001 P25**

9.2.1 Talk Group Call (Clear Voice and Encrypted Voice)

Execution:

1. Key the radio and verify
   - ☐ That the call is heard at the unselect speaker
   - ☐ That the calling radio ID is displayed on the module for TG64001
   - ☐ A green light id displayed indicating an incoming call on module TG64001
2. Switch the radios talk group to 64002TU and key the radio.
   - ☐ That the call is heard at the select speaker
   - ☐ That the calling radio ID is displayed on the module for TG64002
   - ☐ A green light id displayed indicating an incoming call on module TG64002
3. Repeat steps 1-2 on an encrypted Talk Group

Results (Pass/Fail):

Tester:

Date:

Comments:

9.3 Emergency Call and Emergency Alarm

Purpose: **Confirms the console indicates an emergency declared by a terminal radio and can reset and clear the emergency.**

Expected Results: **The console indicates and can clear the emergency.**

Setup: **This test requires a test radio capable of generating and clearing an emergency (i.e. Supervisor Radio).**

Table 30: Test radio setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001

Execution:

1. Select the 64002TG in the console. Using the test radio, declare an emergency on 64001TG.
   - ☐ Verify the module for '64001TG' turns red,
   - ☐ Verify the ID/Name of the test radio is displayed
   - ☐ Verify emergency alert tone is heard on the console.
2. Select the triangle with a '!' to access the emergency menu.
   - ☐ the acknowledge 'Ack' button is red
   - ☐ the check box is red
3. Using the radio, transmit on the talk group
   - ☐ Verify that the call is received by the console.
4. With the console, transmit on the group with the emergency.
   - ☐ Verify the test radio receives the call, and is still in emergency mode.
5. Acknowledge the emergency by selecting the 'Ack' button
   - ☐ Verify the button changes from 'Ack' to clear
   - ☐ verify the radio and the console are still in emergency mode
6. Clear the emergency by selecting the 'Clear X' button
   - ☐ Verify the console clears the emergency
   - ☐ Verify the radio clears the emergency
7. Transmit on the radio
8. Verify the emergency is cleared and normal group calls have resumed.

9. Select 64001TG group selected on the console; declare an emergency on the test group by pressing the 'Emer Declare'.
   - ☐ Verify the console and radio have the same indications as steps 2 to 4.
10. Acknowledge by hitting 'Ack' in step 4
11. Clear the emergency with the console.

Results (Pass/Fail):

Tester:

Date:

Comments:

9.4 System Wide Call (All Call & Announcements)

Purpose: **Confirm the console can initiate system wide calls.**

Expected Results: **The console can initiate both All Calls and Announcement Calls.**

Setup: **Program console modules with the 'TG64000 P25' talk group**

Table 31: Test radio setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64052 P25	64052
Radio 3	998003	TG64001 P25	64001
Radio 4	998004	TG64001 P25	64002

Execution:

1. Press INSTANT TX on the module with 'TG64000 P25'.
   - ☐ Verify that a channel access tone is heard,
   - ☐ Verify the ripple effect on the 'TX' indicator is displayed
   - ☐ Verify that the call is heard at all radios
2. Release the Instant TX key.
3. Press INSTANT TX on the module with 'TG64051 P25'.
   - ☐ Verify that a channel access tone is heard,
   - ☐ Verify the ripple effect is displayed
   - ☐ Verify the call is heard at Radios 1. Verify Radios 2, 3
   - ☐ Verify radio 4 did not hear the audio.
4. Release the Instant TX key.
5. Press INSTANT TX on the module with 'TG64001 P25'.
   - ☐ Verify that a channel access tone is heard,
   - ☐ The ripple effect is displayed,
   - ☐ The call is heard at Radios 3.
   - ☐ Verify that Radios 1 2
   - ☐ Radio 4 did not hear the audio.
6. Release the Instant TX key.

Results (Pass/Fail):

Tester:

Date:

Comments:

9.5 Alert Tones

Purpose: **Confirm the console can initiate alert tones, which can be heard at the terminal radio.**

Expected Results: **The tones can be initiated and heard.**

Setup: **Console 1 programmed with TG64052 and TG64051 selected.**

Table 32: Test radio setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998002	TG64002 P25	64002

Execution:

1. Make TG64001 P25 the selected talk group.
2. Select the tones tab on the talk group module.
3. Key the console with a method other than the mouse.
4. Radio 1 will receive the call.
   - ☐ While still transmitting, select one of the three ALERT TONE keys by selecting the drop down list next to the orange button.
5. Test that all three alert tones can be heard on the radio.
   - ☐ Verify the ALERT TONE is received by Radio 1 and also heard on the console (to hear the tones on the console, press and hold the foot pedal and listen for the tone on the SELECT speaker).
6. While not transmitting, press and hold one of the ALERT TONE keys.
   - ☐ Verify the console transmits on talkgroup, TG64051 P25, Radio 1 receives the call, and the alert tone is heard by Radio 1 and the console (to hear the tone on the console, press and hold one of the alert tone keys and listen for the tone on the SELECT speaker).
7. When the ALERT TONE key is released
   - ☐ Verify the call on Radio 1 drops

Results (Pass/Fail):

Tester:

Date:

Comments:

9.6 Console Pre-Empt

Purpose: **Confirm the console can pre-empt an ongoing call between terminal radios.**

Expected Results: **The call initiated by the radio will be interrupted by the console.**

Setup: **Console 1 programmed with talk-group TG64051 P25**

Table 33: Test radio setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64001 P25	64001
Radio 2	998001	TG64001 P25	64001

Execution:

1. Key Radio 1 on the TG64001 and hold the call up. Verify that audio is heard at Radio 2 and the console.
2. Key the console on TG64001and hold the while continuing to hold the call up on Radio 1
   - ☐ Verify the console pre-empts
   - ☐ Verify that the transmit indicator is displayed along with the pre-empted caller LID and CALL indicator
   - ☐ Verify that the second radio begins to hear the console audio and not the first radio call.
   - ☐ Verify that the pre-empted radio audio is still heard on the pre-empting console.
3. Un-key the first Radio.
   - ☐ Verify that the pre-empted caller LID and CALL indicators are removed and the pre-empted radio audio is no longer heard on the pre-empting console.
4. Un-key the console.

Results (Pass/Fail):

Tester:

Date:

Comments:

9.7 Simulselect

Purpose: **Confirms operation of the console Simulselect feature, which allows multiple talk groups to be selected for communication simultaneously.**

Expected Results: **The console can select multiple talk groups and communication is allowed.**

Setup **Console 1 programmed with talk groups TG64051 P25, TG64052 P25, TG64053 P25, and TG64054 P25.**

Table 34: Test radio setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64052 P25	64052
Radio 3	998003	TG64001 P25	64001
Radio 4	998004	TG64001 P25	64002

Execution:

1. Create simulselect group on the 4 test group modules
2. Place a call from the console on the simulselect group
   - ☐ Verify that the call is heard all four radios
3. Place a call from each radio
   - ☐ Verify that only the console hears the calls
   - ☐ Verify only the radios on similar talk groups here the call
4. Deactivate the simulselect group.

Results (Pass/Fail):

Tester:

Date:

Comments:

9.8 Patch

Purpose: **Confirms the console patch feature creates shared communication between multiple selected talk groups.**

Expected Results: **The patched talk groups can communicate.**

Setup **Console 1 programmed with talk groups TG64051 P25, TG64052 P25, TG64053 P25, and TG64054 P25.**

Table 35: Test radio setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64052 P25	64052
Radio 3	998003	TG64001 P25	64001
Radio 4	998004	TG64001 P25	64002

Execution:

1. Create patch on PATCH 1 with all four groups above.
2. Place a call from the newly created patch
   - ☐ Verify that the call is heard on all the radios
3. Place a call from each radio
   - ☐ Verify that the call is heard on the console and each radio.
4. Deactivate the patch.

Results (Pass/Fail):

Tester:

Date:

Comments:

10. BEON FEATURES

Purpose: **These will test the BeOn features.**

Expected Results: **This test will demonstrate that BeOn works as designed.**

Setup: **This test will show that the BeOn system allows a smartphone to communicate with the radio system.**

10.1 Transmit Grant Tone

Purpose: **This test will demonstrate the grant tone on BeOn.**

Expected Results: **When the smartphone PTTs on the BeOn app it will play a grant tone.**

Setup: **Grant tone (Ready to Talk tone) enabled in smartphone radio personality.**

Table 36: Test BeOn device setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

1. Press PTT button on smartphone with valid group selected.
   - ☐ Verify grant tone is heard at smartphone when working channel access is granted.

Note: If the call is queued, the grant tone will be delayed until the call is assigned a working channel.

Results (Pass/Fail):

Tester:

Date:

Comments:

10.2 Group Call

Purpose: **Confirms the scan function, which allows a smartphone to hear audio on selected talk-groups other than the current talk-group.**

Expected Results: **Selected talk-group call audio is heard.**

Setup: **Set smart-phones 1, 2, & 3 to (Group A) per test group structure. Make sure Scan is turned OFF.**

Table 37: Test BeOn device setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

1. PTT on BeOn_202 and talk.
   - ☐ The transmit (TX) indicators should turn on at BeOn_202.
   - ☐ Audio should be heard in BeOn_203, and BeOn_204.
   - ☐ The ID of BeOn_202 should be seen at BeOn_203, and BeOn_204.
2. Set BeOn_204 to TG64152 P25. PTT on BeOn_202 and talk.
   - ☐ The transmit (TX) indicators should turn on at BeOn_202.
   - ☐ Audio should be heard in BeOn_203 only.
   - ☐ The ID of BeOn_202 should be seen at BeOn_203 only.

Results (Pass/Fail):

Tester:

Date:

Comments:

10.3 Group Scan

Purpose: **Confirms the scan function, which allows a smartphone to hear audio on selected talk-groups other than the current talk-group.**

Expected Results: **Selected talk-group call audio is heard.**

Setup: **BeOn_202 set up with TG64151 P25 and TG64152 P25 in the scan list, TG64151 P25 selected, and group scan initially disabled.**

Table 38: Test BeOn device setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64151 P25	64151
BeOn_204	998204	TG64151 P25	64151

Execution:

1. Place a call from BeOn_203 on TG64151 P25.
   - ☐ Verify the call is received and audio is heard on BeOn_202.
2. Place a call from BeOn_203 on TG64152 P25.
   - ☐ Verify the call is not received by BeOn_202.
3. Enable group scan on BeOn_202.
4. Place another call from BeOn_203 on TG64152 P25.
   - ☐ Verify that the call is now received and audio is heard on BeOn_202.

Results (Pass/Fail):

Tester:

Date:

Comments:

10.4 Emergency Group Call

Purpose: **Confirms an emergency can be declared, recognized and cleared by a smartphone.**

Expected Results: **The emergency is declared, recognized and cleared.**

Setup:

Table 39: Test BeOn device setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
BeOn_202	998202	TG64151 P25	64151
BeOn_203	998203	TG64152 P25	64152
BeOn_204	998204	TG64153 P25	64153

Execution:

1. Press the Emergency call button on BeOn_204 and then PTT BeOn_204.
   - ☐ Verify that BeOn_204 indicates the "TX EMER" declaration and that it reverts to the home group.
   - ☐ Verify that BeOn_202 and BeOn_203 indicate a "RX EMER" and hear audio on the emergency home group.
2. Clear the emergency with the Supervisor smartphone (BeOn_202).
   - ☐ Verify the emergency clears in the smartphones.

Results (Pass/Fail):

Tester:

Date:

Comments:

11. TRUNKED LOGGING RECORDER *(if applicable)*

11.1 Group Call

Purpose: **Confirms group call audio is captured, recorded and accessible on the logging recorder**

Expected Results: **Calls are captured, recorded and accessible.**

Setup:

Table 40: Test radio setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64051 P25	64051
Radio 3	998003	TG64051 P25	64051

1. PTT radio 1 and talk.
   - ☐ Audio should be heard on radio 2. Note the Start time of the call and the approximate duration.
2. Retrieve the call from the Logging Recorder.
   - ☐ Verify the Caller, Callee, Start Time, and duration.
   - ☐ The Caller should be the LID for Radio 1 and the Callee should be the GID for 64051. Verification should include the LID/GID and its Alias as defined by the UAS.
   - ☐ Verify that the call is identified as a Group Call.
3. Playback the audio
   - ☐ Confirm that the playback audio is all recorded and intelligible.
4. Repeat using Encryption.

Results (Pass/Fail):

Tester:

Date:

Comments:

11.2 Emergency Group Call

Purpose: **Confirms emergency group call audio is captured, recorded and accessible on the logging recorder**

Expected Results: **Calls are captured, recorded and accessible.**

Setup:

Table 41: Test radio setup

Radio Description	Radio Lid	Talk Group Description	Talk Group ID
Radio 1	998001	TG64051 P25	64051
Radio 2	998002	TG64051 P25	64051
Radio 3	998003	TG64051 P25	64051

Execution:

1. Press the Emergency call button on radio 2. Talk during the Hot Mic transmit time.
2. Clear the emergency with the radio 1.
3. Retrieve the call from the Logging Recorder.
   - ☐ Verify the Caller
   - ☐ Verify the Callee
   - ☐ Verify the start time
   - ☐ Verify the duration
   - ☐ The Caller should be the LID for Radio 2 and the Callee should be the GID for the Home Group.
   - ☐ Verification should include the LID/GID and its Alias as defined by the UAS.
   - ☐ Verify that the call is identified as an Emergency.
   - ☐ Playback the audio and confirm that it is all recorded and intelligible.

Results (Pass/Fail):

Tester:

Date:

Comments:

12. P25 SIMULCAST BYPASS OPERATION

Program the MASTR V modules (both Control Points and Transmit Sites) to the Final Configuration. Refer to the installation manual for the guide to setting TX Traffic Controllers / CP Traffic Controllers personality parameters.

Verify the BYPASS plan has been reviewed and approved by customer representative. This procedure makes assumptions on bypass sites before implementation and test of the System. After WMS/Panther signal strength data collection, final decision will be made on the actual bypass "ON" and "OFF" sites.

Prepare a minimum of two terminal radios programmed to operate on the active BYPASS site and the main simulcast system.

12.1 Site OFF - Final Configuration

Purpose: **Confirm sites configured to be in the "OFF" condition during BYPASS are in the expected BYPASS mode.**

Expected Results: **The "OFF" site traffic, controllers have no control channel.**

Setup: **Sites intended to be "OFF" in event of BYPASS must have all channels set to disabled (unchecked in Device Manager, TC personality).**

Execution:

1. At one of the sites designated as an "off" site, create a condition to force BYPASS by disconnecting the router to MPLS connection. All other sites will have the HPAs disabled locally.
   - ☐ Verify transmit site is in BYPASS mode.
   - ☐ The Traffic Controller module display indicates "TC" instead of "TR". Note: TC= Working Traffic Channel, standalone mode, TR=Working Channel, simulcast mode, and Control Channel, simulcast mode is indicated by the transmit LED indicator.
2. Observe the repeater (station) Traffic Controller modules.
   - ☐ Verify there is no active control channel.
   - ☐ Verify no stations are keyed or producing RF power.
3. Restore the site to normal by returning the site to simulcast mode by reconnecting the router to MPLS connection.
   - ☐ Verify transmit site is in normal simulcast mode. The Traffic Controller modules will indicate "TR (n)", where n is the channel number.

4. Repeat steps 1-3 for the remaining "OFF" bypass sites in the simulcast system under test.

Results (Pass/Fail):

Tester:

Date:

Comments:

12.2 Site ON (trunking) - Final Configuration

Purpose: **Confirm sites configured to be in the "ON" condition during BYPASS are in the expected BYPASS mode.**

Expected Results: **The "ON" site traffic controllers have a control channel and calls to terminal radios can be initiated.**

Setup:

Execution:

1. Create a condition to force BYPASS by disconnecting the router to MPLS connection.
   - ☐ Verify transmit site is in BYPASS mode. BYPS LED on Baseband module and the Traffic Controller module display indicates either "TC" or "CC" instead of "TR.
   - ☐ Observe the stations/repeater Traffic Controller modules. Verify there is an active control channel on one of the Traffic Controller modules. The remaining repeater/stations Traffic Controller modules will indicate "TC".
   - ☐ Verify the station appearing as control channel is keyed, producing RF power and modulated with control channel data.
   - ☐ Verify a terminal radio set to the system programmed for the site in BYPASS with the correct site ID recognizes the site's control channel data.
2. Key the terminal radio on a group call.
   - ☐ Verify a working channel assignment is made within the channel group allowed in the personality.
   - ☐ Verify the call is heard on a second terminal radio set to the active BYPASS system.
3. Restore the site to simulcast mode by reconnecting the router to MPLS connection.
   - ☐ Verify transmit site is in normal simulcast mode. Traffic Controller modules indicate "TR (n).
4. Repeat steps 1-3 for the remaining "ON" bypass sites in the simulcast system under test.

Results (Pass/Fail):

Tester:

Date:

Comments:

12.3 Control Point Trunking Reset Control

Purpose: **A properly set up Simulcast BYPASS system will disable CP Traffic Controller modules associated with active channels at a TX site operating in BYPASS. This keeps the remaining sites operating in Simulcast mode from being assigned to channels expected to be active at the site in BYPASS. Sites programmed to be OFF in BYPASS will not require any Traffic Controller modules to be held OFF.**

Expected Results: **This test will verify that the Control Point Traffic Controller modules will be held OFF corresponding to the active channels at a site as a result of the TX site being in BYPASS.**

Setup:

Execution:

1. Force a TX site that will become active into BYPASS by disconnecting the router to MPLS connection.
   - ☐ Verify TX site is in BYPASS mode.
   - ☐ Verify transmit site is in BYPASS mode. Traffic Controller module display indicates either "TC" or "CC" instead of "TR".
   - ☐ Verify the CP Traffic Controller modules on the channels intended to be OFF are held OFF.
2. Observe the RNM screen for the simulcast system.
   - ☐ Verify the channels intended to be OFF at the Control Point are reported as OFF (RED).
3. Restore the site to simulcast mode by reconnecting the router to MPLS connection.
   - ☐ Verify the TX site Traffic Controller modules revert to normal Simulcast.
   - ☐ Verify the CP Traffic Controller modules associated with the site in BYPASS are returned to normal.

Results (Pass/Fail):

Tester:

Date:

Comments:

12.4 Bypass – Site Minimum Channels

Purpose: **Confirm a site enters bypass when active channels fall below site minimum channels setting.**

Expected Results: **The site enters bypass mode.**

Setup: **Sites are configured with cluster minimum channels set to six and site minimum channels to seven.**

Bypass Plan: TR Site 1 Ch 3,4,5; TR Site 2 Ch 6,7,8; TR site 3 Ch 9,10,11 TR Sites 4 and 5 dark

Note **Settings and bypass plan can be customer final settings; execution will have to adjust to accommodate those settings.**

Execution:

1. At TR site 1 disable channels 8 - 11 using the TX disable switch on the PA (only channels 1-7 are still functioning).
   - ☐ Verify system and site still functioning in simulcast; the disabled channels 8-11 are in alarm state at the control point site.
   - ☐ At TR site 1, the Traffic Controller modules displays still indicates "TR" not "TC" or "CC". Note: TC= Working Traffic Channel, standalone mode, TR=Working Channel, simulcast mode, and Control Channel, simulcast mode is indicated by the transmit LED indicator.
2. At the same site, disable channel 7 using the TX disable switch on the PA.
   - ☐ Verify system is still functioning in simulcast. Control Point Ch. 3, 4 and 5 in alarm state.
   - ☐ Verify TR site 1 is in bypass. The Traffic Controller module display indicates "TC" instead of "TR". All channels status indicates alarm. Note: TC= Working Traffic Channel, standalone mode, TR=Working Channel, simulcast mode, and Control Channel, simulcast mode is indicated by the transmit LED indicator always on.
3. At the same site restore, all channels back to service (enable the PA using the TX disable switch on the PA).
   - ☐ Verify transmit site one is in normal simulcast mode. The Traffic Controller modules will indicate "TR (n), where n is the channel number.
   - ☐ Verify all channels are in service at the control point.

Results (Pass/Fail):

Tester:

Date:

Comments:

12.5 Bypass – Cluster Minimum Channels – TR site failures

Purpose: **Confirm all sites enter bypass when available channels fall below the cluster minimum channels setting. Depending upon the system size, bypass plan and which channels have been failed a subset of sites may subsequently come out of bypass and operate as a cluster before any channels are restored to service.**

Expected Results: All site in the system enter bypass mode.

Setup: **Sites are configured with cluster minimum channels set to six and site minimum channels set to seven (these settings are normally lower; they are set high to simplify testing).**

Execution:

1. At TR site 1 disable channels 9, 10 and 11 using the TX disable switch on the PA (8 channels are still functioning.
   - ☐ Verify system and site still functioning in simulcast.
   - ☐ The Traffic Controller module displays still indicates "TR" not "TC" or "CC". Note: TC= Working Traffic Channel, standalone mode, TR=Working Channel, simulcast mode, and Control Channel, simulcast mode is indicated by the transmit LED indicator.
2. At TR site 3 disable channels 6, 7 and 8 using the TX disable switch on the PA (5 channels are still functioning).
   - ☐ Verify all sites have entered bypass (the TCs display "TC" and "CC", not "TR" and every channel status indicates failed at every site.
3. Enable the PAs at the sites using the TX disable switches.
   - ☐ Verify the system recovers to simulcast mode with all transmit sites in normal simulcast mode. The Traffic Controller modules will indicate "TR (n)", where n is the channel number.

Results (Pass/Fail):

Tester:

Date:

Comments:

12.6 Site ON (trunking) - Enhanced bypass Final Configuration

Purpose: **Confirm sites configured to be in the "ON" condition during BYPASS are in the expected BYPASS mode and can connect to VNIC.**

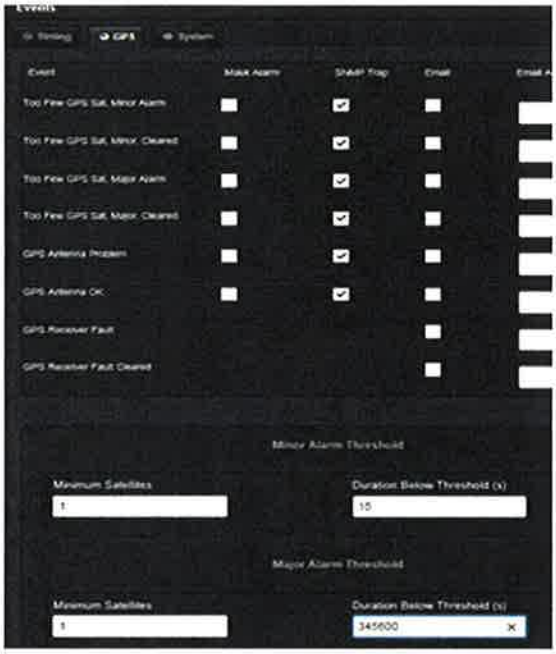
Expected Results: **The "ON" site traffic controllers have a control channel and calls between terminal radios and dispatch can be made.**

Setup:

Execution:

1. Create a condition to force BYPASS that does not disrupt network connectivity by logging into both GPS receivers and configuring their notifications to set the major alarm threshold to minimum satellites 12 and duration below threshold 5 seconds. This will cause the GPS receivers to set a major alarm after 5 seconds.
2. Configure Notifications from Spectracom GPS ReceiversNavigate to Management Notifications:

3. In the **Events** windowpane, click the **GPS** tab.
4. Set the Major Alarm Threshold as follows:
    a. Minimum Satellites: **12**
    b. Duration Below Threshold: **5**
5. Click: **[Submit]**



6. Verify transmit site is in BYPASS mode. The Traffic Controller module display indicates either "TC" or "CC" instead of "TR".
   - ☐ Observe the stations/repeater Traffic Controller modules. Verify there is an active control channel on one of the Traffic Controller modules. The remaining repeater/stations Traffic Controller modules will indicate "TC".
   - ☐ Verify the station appearing as control channel is keyed, producing RF power and modulated with control channel data.
   - ☐ Verify a terminal radio set to the system programmed for the site in BYPASS with the correct site ID recognizes the site's control channel data.
7. Key the terminal radio on a group call.
   - ☐ Verify a working channel assignment is made within the channel group allowed in the personality.
8. Restore the site to simulcast mode by restoring the GPS major alarm notification threshold to minimum satellites = one and duration = 345600 for both GPS receivers.
   - ☐ Verify transmit site is in normal simulcast mode. Traffic Controller modules indicate "TR (n).

Results (Pass/Fail):
Tester:

Date:

Comments:

13. VIDA INTER-OPERABILITY GATEWAY TEST

13.1 Local Interoperability

Purpose: **The purpose of this test is to verify correct functionality of the Interoperability Gateway.**

Expected Results: **Verify that the**

Setup: **The Interoperability Gateway connects via 4-wire audio connections in its Universal Access Cards (UAC) cards to interoperability radio units (mobile or desktop). The Gateway also connects to a router and the Network Switching Center (NSC) to provide call functionality across the network.**

Execution:

1. Select Inter-op group 1 on the radio.
2. Initiate a call from the radio to group 1
   - ☐ Verify that audio is heard on inter-op group 1 external radio.
3. Initiate a call from the inter-op group 1 radio to group 1
   - ☐ Verify that audio is heard on the radio.
4. Program the InterOp Group 1 in a Symphony Console module
5. Initiate a call from the Symphony console to group 1
   - ☐ Verify that audio is heard on inter-op group 1 radio.
6. Initiate a call from the inter-op group 1 radio to group 1
   - ☐ Verify that audio is heard on the Symphony console

Results (Pass/Fail):

Tester:

Date:

Comments:

13.2 Conventional Base Station Controls

Purpose: **The purpose of this test is to verify correct functionality of the Symphony Console's Conventional Base Station Controls.**

Expected Results: **Verify that the Symphony Console can transmit and receive audio on a conventional base station channel to/from a radio on the conventional channel.**

Setup: **The Symphony Dispatch Console supports conventional base station control with special modules. This allows dispatch communications with the conventional radio units operating on the respective conventional base station equipment interconnected to the VIDA system through the Interoperability Gateway.**

Execution:

1. On a Symphony Console, program a Conventional Base Station Module with a Conventional Base Station that can be utilized for testing.
2. Select the conventional channel on the test radio(s).
3. While first ensuring (monitor) that no audio is present on the channel before transmitting. Initiate a call from the Symphony Console to the conventional channel under test
    - ☐ Verify that audio is heard on the radio
4. While first ensuring (monitor) that no audio is present on the channel before transmitting, initiate a call from the radio on the conventional channel under test
    - ☐ Verify that audio is heard on the Symphony Console

Results (Pass/Fail):

Tester:

Date:

Comments:

14. ACTION ITEMS

Table 42: Issues and action items

Test	Page	Action/Issue

15. ACRONYMS AND DEFINITIONS

ACI	Access Control Item (used with respect to computer system security)
Ack	Acknowledgement
AD	Active Directory
ADPCM	Adaptive Differential Pulse Code Modulation, a speech codec that can also digitize tones successfully
Advanced P25 Radio	A Harris radio which supports proprietary advanced P25 features, such as provisioning and emergency auto PTT
AES	Advanced Encryption Standard
AFC	Automatic Frequency Control
AGID	Announcement Group ID. The Announcement Group is a wider area talkgroup associated with the priority talkgroup. The VNIC maintains a database of GIDs and AGIDs, and during registration sends the appropriate AGID to the subscriber device, corresponding to his priority talkgroup. The radio then watches for voice calls addressed to the GID and AGID
ALGID	Algorithm ID, an 8-bit field that identifies the voice encryption algorithm
AM	Amplitude Modulation
AMBE	Advanced Multi Band Excitation, a voice codec developed by Digital Voice Systems Inc. (DVSI) and used in P25
ANI	Automatic Number Identification
AOC	Agency Operations Center
API	Application Programming Interface
ARP	Address Resolution Protocol
ARQ	Automatic Repeat Request
AVL	Automatic Vehicle Location

Basic P25 Radio	A P25 radio which does not support the Harris proprietary features such as registration on conventional systems, provisioning and software download
BCH	A family of error correction and detection codes which were invented by Bose, Ray-Chaudhuri and Hocquenghem
C4FM	Compatible 4-level FM, an FM modulation technique that is similar to CQPSK modulation
CAD	Computer Aided Dispatch
CAI	Common Air Interface (usually in reference to P25)
CBC	Cipher Block Chaining
CCIR	Comite Consultatif Internationale pour la Radio, a forerunner of the ITU-R
CDPD	Cellular Digital Packet Data
CEB	Console Electronics Bank, a Motorola analog voice switch
CEC	Central Electronics Controller, a version of the Harris EDACS IMC which was used as a local voice switch for dispatch consoles
CME	Cisco Mobility Exchange (Telco Interconnect)
CNM	Central Network Manager, a Harris product
Confirmed Call	A confirmed call is a special type of call where the call is queued until all sites have resources available, or until the confirmed call timer expires (configurable, typically one or two seconds)
COR	Carrier Operated Relay
COTS	Commercial Off the Shelf
CQPSK	Compatible QPSK, a form of QPSK modulation, which is similar to C4FM modulation
CRC	Cyclic Redundancy Check, a form of error detection coding
CSMA	Carrier Sense Multiple Access, a means where many subscriber devices can share access to a radio channel and minimize the risk of collisions
CTCSS	Continuous Tone Coded Squelch System

DCOMP	Data Payload Compression, a four bit field in the P25 SNDCP header which specifies the nature of user payload data compression (presently no compression is supported)
DES	Digital Encryption Standard
dibit	Two bits, which represent an analog channel symbol
DM	Device Manager
DMZ	Demilitarized Zone
DNS	Domain Name Server
DoS	Denial of Service, a type of Internet attack
DTMF	Dual Tone Multi Frequency
DUID	Data Unit ID, a 4 bit field of the NID which indicates the format of the control channel packet
E&M	Ear and Mouth (a form of telephone signaling)
ECB	Electronic Code Book, a mode of AES operation
EDACS	Enhanced Digital Access Communications System, a proprietary Harris system
EIA	Electronics Industry Association
EIGRP	Enhanced Interior Gateway Protocol, a proprietary Cisco routing protocol
ERTT	Emergency Request To Talk
ES	Encryption Sync Word (240 bits). This includes the 72-bit Message Indicator (MI), 8-bit Algorithm ID (ALGID), and 16-bit Key ID (KID), which total 96 bits. A RS inner code adds 48 parity bits, and then a Hamming outer code adds 96 parity bits for a total length of 240 bits
ESN	Electronic Serial Number (64 bits)
ETDU	Extended Terminator Data Unit
FDMA	Frequency Division Multiple Access
FEMA	Federal Emergency Management System (US Government)
FIPS 140-2	Federal Information Processing Standard, publication 140-2. The title is “Security Requirements

	for Cryptographic Modules"
FLA	Four Letter Acronym (to be avoided if possible)
FM	Frequency Modulation
FMF	Full Message Flag, in packet data unit header blocks
FNE	Fixed Network Equipment. In the P25 world, the FNE is the network infrastructure including the base site and VNIC
Foreign Radio	A radio roaming to this site from another region or WACN
FS	Frame Synchronization (a 48-bit field in the control channel)
FSK	Frequency Shift Keying
FTP	File Transfer Protocol
FX	A comprehensive software maintenance program that provides semiannual upgrades to Harris developed software applications
GID	Group ID (16 bit). This corresponds to a talkgroup. The Group ID is unique within a VNIC, and can be reused on other VNICs within the same WACN. Some of the older P25 documents refer to the GID as a Talkgroup ID (TGID)
GMIM	Gateway MASTR III Interface Module, an interface controller card that plugs into the EDACS IMC
Golay	An error correcting code-named in honor of Marcel Golay
GSM610	Full Rate digital speech coding standard initially developed for digital mobile phone systems with a 13.3 dbit/s bit rate.
G-STAR	A type of tone signaling used by GE radio
GVIU	Gateway Voice Interface Unit, an interface controller card that plugs into the EDACS IMC
HA	High Availability
H-CPM	Harmonized Continuous Phase Modulation (used for the P25 Phase 2 inbound channel)
H-DQPSK	Harmonized differential Quadrature Phase Shift Keying (used for the P25 Phase 2 outbound

	channel)
HDU	Header Data Unit, the first block transmitted on the CAI in a voice call
HIDPS	Host based Intrusion Detection and Prevention System (a McAfee product)
IAVA	Information Assurance Vulnerability Alert
ICMP	Internet Control Message Protocol
IFW	Internet Firewall
IG	Interoperability Gateway
I-ISCH	Information Inter-slot Control Channel (Phase 2)
IMBE	Improved Multi Band Excitation, a voice codec developed by Digital Voice Systems Inc. (DVSI) and used in P25
IMC	Integrated Multisite and Console controller, this is the EDACS voice switch
Individual Call	An individual call is a private call between one user and another. It can be between two radios, or between one radio and a dispatch console
IOS	Internetwork Operating System (a Cisco product)
IP	Internet Protocol
IPS	Intrusion Prevention System
ISCH	Inter-slot Signaling Channel (Phase 2)
ISP	Inbound Signaling Packet (on the control channel)
ISSI	Inter Sub System Interface. This is the interface between WACNs, in the Harris architecture an interface between a VNIC and a foreign P25 system
KEK	Key Encryption Key
KID	16 bit Encryption Key ID
KMF	Key Management Facility
KMM	Key Management Message

LAN	Local Area Network
LC	Link Control word, transmitted in the LDU on the CAI
LCF	Link Control Format, an 8-bit field that specifies the format of the LC word
LCH	Logical Channel (Phase 2)
LDU	Logical Link Data Unit, the blocks that follow the HDU on the CAI
LDU1	Contains the LC word
LDU2	Contains the ES word
LED	Light Emitting Diode
LMR	Land Mobile Radio
LMS	LAN Management Solution
LRA	Location Registration Area. "This defines the region of a Registration Area in which a subscriber unit may roam without the need to indicate a location update to the network. The Registration Area will typically consist of a number of LRAs. The LRA may be a single site or a collection of sites of an RFSS. The octet's exact meaning is a system design issue and explicit numerical assignments are to be made by the system designer". For Harris an LRA is a trunked site or a conventional channel (we generally set LRA, RFSS ID and Site ID to be the same value). Motorola has an architecture where more than one RF site can be controlled by one RFSS controller (RFSS basically equals LRA) so you can roam from one RF site to another without re-registering
LSD	Low Speed Data
MASTR V	A Harris base station product
MES	Mobile End System, a subscriber radio
MFID	Manufacturer ID. An 8-bit field identifying the manufacturer of the subscriber device. The default value is zero, indicating conformance with the P25 specification. A non-zero value indicates that the message format deviates from the standard (for example a proprietary feature)
MI	Message Indicator, the 72-bit initialization vector for the voice encryption algorithm

MIM	MASTR III Interface Module, an interface controller card that plugs into the EDACS IMC
MME	Miniature Mobility Exchange, which consists of Harris software running on a SitePro card at the base site. The MME runs the SNDCP layer of the data protocol and is the equivalent of the P25 RFG (RF Gateway)
MRC	Mobile Routing and Control. In the P25 world, this is the device at the mobile radio, which speaks SNDCP (usually it is the mobile radio itself)
MTU	Maximum Transmitted Unit, used in SNDCP
N(S)	A 3 bit sequence number for the packet data unit
NAC	Network Access Code. A 12-bit field in the control channel, used as a color code to identify co-channel interferors from other sites. This code can be unique to a site (RFSS), or can be reused within the region
Nack	Negative acknowledgement, a type of control message
NID	Network Identifier. A 16 bit field in the control channel, consisting of a 12 bit Network Access Code and a 4 bit Data Unit ID. Error correction coding expands the NID to 64 bits
NIDS	Network Intrusion Detection
NOC	Network Operations Center
NPQR	New Product Quotation Request
NSAPI	Network Service Access Point Identifier, used in SNDCP
NSC	Network Switching Center
NSS	Network Switching Server
NWS	Network Sentry
OFB	Output Feedback, a mode of DES encryption
OSP	Outbound Signaling Packet (on the control channel)
OTAP	Over The Air Programming

OTAR	Over The Air Rekeying
P25	Project 25, a suite of standards for digital radio communications, developed by the Association of Public Safety Communications Officials (APCO) under the TIA TR-8 engineering committee, and published as the TIA-102 set of documents
PCOMP	IP Header Compression, a four bit field in the P25 SNDCP header which specifies the nature of TCP/IP header compression (presently only RFC1144 compression is supported)
PDU	Packet Data Unit
PEMA	Pennsylvania Emergency Management System
Personality ID Sequence Number	Provided by an advanced P25 subscriber device during registration, to inform the VNIC of its current personality. If necessary, the VNIC will provision the subscriber device with the most recent personality
PKI	Public Key Infrastructure, related to encryption and authentication
PN	Pseudo random Number, usually refers to a sequence of numbers that can be generated using a shift register and exor gates
PPM	Parts Per Million
Priority Talkgroup	The priority talkgroup selected on the subscriber device. Usually this is the talkgroup that the radio will transmit on when the user presses PTT
ProFile	A Harris product used for configuring radios over the P25 radio channel
ProScan	A Harris software algorithm used for radio roaming
PSAP	Public Safety Access Point, usually an agency dispatch center
PSP	Pennsylvania State Police
PSFL	Public Switched Telephone Network
PTT	Push To Talk
QAM	Quadrature Amplitude Modulation

QoS	Quality of Service
QPSK	Quadrature Phase Shift Keying
RA	Registration Area, home VNIC region
RADIUS	Remote Authentication Dial In User, a networking protocol that provides centralized authentication, authorization and accounting management
RAM	Random Access Memory
RAR	Regional Access Router
RF	Radio Frequency
RFC 1661	The Point to Point Protocol (PPP) is defined in the Internet Request for Comment documents 1570, 1661 and 1662
RFP	Request for Proposal
RFSS	RF Sub-System. In the Harris architecture, an RFSS is a single site (in the Motorola world an RFSS is a Motorola Zone Controller, which can support a maximum of 32 channels spanning a number of sites). In the larger P25 world the term RFSS is ambiguous and should be avoided if possible
RFW	Regional Firewall
RMS	Regional Management Server
RNM	Regional Network Manager
RNM	Regional Network Manager
RS	Reed Solomon, a form of error detection and correction coding
RSM	Regional Site Manager, a server that runs the RSM, Activity Warehouse and Device Manager applications
RSSI	Received Signal Strength Indicator
RTT	Request To Talk. This is a mechanism where a radio user in the field wanting to speak with a dispatcher sends an inbound canned data message to the dispatcher, who later responds with

	(usually) an Individual Call
RVM	Regional VIDA Manager, a server that runs the UAS and RNM applications
SACCH	Slow Associated Control Channel (Phase 2)
SAID	System Assigned ID. Used in Patch and Simulselect, where the system assigns a new ID for the merged talkgroup and the radios monitor the new SAID instead of the old GIDs
SAN	Storage Area Network
SAP	Service Access Point, where the network provides a service
SEM	Security Event Manager (a LogLogic product)
SIA	McAffee Security Innovation Alliance
SID	Unit ID, a 24-bit part of SUID. Note that SID is a Harris acronym, and the field is referred to internally as either the SID or the Unit ID (SID was chosen as an acronym because UID was already used for Unified ID. SID sounds like LID, which is an EDACS acronym for a similar parameter). The SID is a value, which is programmed into the radio for a WACN (customer system) and will always be unique within a WACN
SIEM	Security, Information, and Event Management
S-ISCH	Synchronization Inter-slot Control Channel (Phase 2)
Site Management Interface	A software entity which resides on the Network Sentry and is responsible for downloading the SID/GID database from the UAS and Regional Site Manager to the Traffic Controller
SMS	Site Management Services
SMS	Short Message Service
SMTP	Simple Mail Transfer Protocol
SNDCP	Subnetwork Dependent Convergence Protocol
SOAP	Simple Object Access Protocol, a protocol based on XML and relying upon lower layers such as SMTP, it provides a basic messaging framework upon which web services can be built

SOR	Signal Operated Relay
Sourcefire DFC	Defense Center
SS	Status Symbol (a two-bit field in the control channel, used for channel access control signaling)
SSL	Secure Socket Layers
SSH	Secure Shell is a program to log into another computer over a network, to execute commands in a remote machine, and to move files from one machine to another. It provides strong authentication and secure communications over insecure channels. It is a replacement for rlogin, rsh, rcp, and rdist.
SU	Subscriber Unit. In the P25 world, an SU is a mobile or portable radio
SUID	Subscriber Unit ID. A 56-bit unique-in-the-world permanent identifier consisting of WACN, System ID, and SID
SUMS	Security Update Management Service (a Harris product)
SUMSplus	Version of SUMS
System ID	The System ID is a 12-bit field of the network address, which identifies the VNIC
TAC	Technical Assistance Center, a Harris service
TACACS	Terminal Access Controller Access Control System
TDMA	Time Division Multiple Access
TDU	Terminator Data Unit, used to terminate a voice message
TEK	Traffic Encryption Key
Telnet	A terminal emulation program for TCP/IP networks such as the Internet. The Telnet program runs on your computer and connects your PC to a server on the network.
TGID	Talkgroup ID (16 bit, equivalent to GID). The P25 documents usually use GID but some of the older documents use TGID
TIA	Telecommunications Industry Association

TLA	Three Letter Acronym (to be avoided if possible)
Traffic Controller	Software entity, which resides in a base station at the site and generates the P25 control channel
TRC	Tone Remote Control
Trunking Controller	In the larger P25 world, this is the device at the site, which generates the control channel (In the Harris system it is a piece of software called a "control channel", which resides on a SitePro card, which plugs into a base station chassis)
TSBK	Trunking Signaling Block (a 196-bit field in the control channel)
TX	Transmit
UAC	Unified Audio Card
UAS	Unified Administration Server
UDP	User Datagram Protocol
UID	Unified ID. This is a Harris specific acronym referring to an ID composed of the System ID and SID. The UID is a ten-digit number in the form 604-415-4003, representing region, agency, and individual
Unitrends	Enterprise backup for VIDA networks
UPS	Uninterrupted Power Supply
VAS	VIDA Application Server
VCE	VIDA Console Exchange
VCH	Voice Channel (Phase 2)
VDOC	Voice and Data on Control (the control channel can assign itself as a traffic channel)
VIDA	Voice, Interoperability, Data, Access (a Harris system product)
VINI	Voice Independent Network Identifier. This is a Harris specific acronym referring to a value consisting of ESN, User ID and password, required by the proxy for registration with the VNIC
VLAN	Virtual Local Area Network

VM	Virtual Machine
VME	Versa Module Eurocard (IEEE 1014)
VNIC	Voice Network Interface Controller, the Harris voice switch
VOX	Voice Operated Switch
VPN	Virtual Private Network
VSWR	Voltage Standing Wave Ratio
VTCH	Voice Transport Control Channel (Phase 2)
VTI	VIDA Telephone Interconnect
WACN	Wide Area Communication Network (20-bit network ID, part of SUID). This is a customer network, which can include many VNICs
WAR	Wide Area Router
WGID	Working Group ID (16 bit, usually the same value as the GID). This is the value, which is actually used on the airlink. When a foreign radio roams in from another System ID (indicating a different VNIC) or WACN, its GID may conflict with GIDs used in this region. In this case the VNIC will provide the radio with a WGID which does not conflict, effectively a temporary GID
WUID	Working Unit ID (24 bit, usually the same value as the SID). This is the value, which is actually used on the airlink. When a foreign radio roams in from another System ID (indicating a different VNIC) or WACN, its SID may conflict with SIDs used in this region. In this case, the VNIC will provide the radio with a WUID which does not conflict, effectively a temporary SID
XML	Extensible Markup Language, used for building websites
Zeroize	A P25 control channel command, which causes the mobile radio to erase its encryption keys (but then requires manual loading to restore encryption keys)

Client#: 1605610 COMMUINT8

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THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: POLICY X PRO-JECT LOC OTHER:			MWZY312497	03/01/2019	03/01/2020	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$1,000,000 $500,000 $10,000 $1,000,000 $2,000,000 $2,000,000
A	AUTOMOBILE LIABILITY X ANY AUTO OWNED AUTOS ONLY HIRED AUTOS ONLY SCHEDULED AUTOS NON-OWNED AUTOS ONLY			MWTB312496	03/01/2019	03/01/2020	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$1,000,000 $ $ $
B	X UMBRELLA LIAB OCCUR EXCESS LIAB CLAIMS-MADE DED RETENTION $			CX007QX19	03/01/2019	03/01/2020	EACH OCCURRENCE AGGREGATE	$5,000,000 $
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y / N (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		MWC31249819	03/01/2019	03/01/2020	X PER STATUTE OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $1,000,000 $1,000,000 $1,000,000
A	Garage Keepers			MWZY312497	03/01/2019	03/01/2020	400,000 / 1,000,000	
C	Cyber & Tech E&O			MTP903167104	03/01/2019	03/01/2020	3,000,000	
A	Garage Liability			MWY312497	03/01/2019	03/01/2020	1,000,000	

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

The General Liability policy includes an automatic Additional Insured endorsement that provides Additional Insured status to the Certificate Holder only when there is a written contract that requires such status, and only with regard to work performed on behalf of the named insured.

CERTIFICATE HOLDER

Brevard County Board of County Commissioners
1746 Cedar Street
Rockledge, FL 32955

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

BXVZP

ATTACHMENT F: TASK ORDER 1

ITEM	DESCRIPTION	PRICE
1	**Transition all the existing conventional channels from the EDACS Analog Switches (IMCs) to the VIDA core.**	**$245,176.78**
	TOTAL	**$245,176.78**

PAYMENTS

The County shall pay each task order to the Contractor as follows:

1. Fifteen percent (15%) of the Total Task Price shall be due at the time of the Design review meeting
2. Thirty-Five (35%) percent of the Total Task Price shall be due upon Hardware shipment.
3. Fifteen (15%) percent of the Total Task Price shall be due upon completion of the Installation.
4. Twenty (20%) percent of the Total Task Price shall be due upon successful completion of "Acceptance Testing" as identified in the implementation plan.
5. Fifteen (15%) percent of the Total Task Price shall be due upon "Cutover" as identified in the implementation plan.

SCOPE OF WORK FOR TASK ORDER 1

- Transition all the existing conventional channels from the EDACS Analog Switches (IMCs) to the VIDA core, supporting existing 4-wire audio and tone/E&M control.
- Add conventional control to BCSO and BCFR supervisor symphony consoles.

ATTACHMENT G: TASK ORDER 2

ITEM	DESCRIPTION	PRICE
1	**South Cell Design - Melbourne**	**$385,850.12**
2	**South Cell Design – Indian Harbor Beach**	**$315,381.83**
3	**South Cell Hardware**	**$153,975.34**
4	**South Cell Installation**	**$169,193.00**
5	**Discount/Trade-ins**	**($280,937.50)**
	TOTAL	**$743,462.79**

PAYMENTS

The County shall pay each task order to the Contractor as follows:

1. Fifteen percent (15%) of the Total Task Price shall be due at the time of the Design review meeting
2. Thirty-Five (35%) percent of the Total Task Price shall be due upon Hardware shipment.
3. Fifteen (15%) percent of the Total Task Price shall be due upon completion of the Installation.
4. Twenty (20%) percent of the Total Task Price shall be due upon successful completion of "Acceptance Testing" as identified in the implementation plan.
5. Fifteen (15%) percent of the Total Task Price shall be due upon "Cutover" as identified in the implementation plan.

SCOPE OF WORK FOR TASK ORDER 2

- Implement the Melbourne Control Point and Indian Harbor Beach Site of the South P25 Phase 2 Simulcast System with a redundant distributed control point.
- Design, installation, tower work, project management, acceptance testing, engineering, licensing and implementation plan for the two (2) sites.
- Install and cutover DC Power plant and antenna system for the two (2) sites.

ATTACHMENT H: TASK ORDER 3

ITEM	DESCRIPTION	PRICE
1	**South Cell Design – Palm Bay**	**$435,850.12**
2	**South Cell Design – Barefoot Bay**	**$315,381.83**
3	**South Cell Hardware**	**$153,975.34**
4	**South Cell Installation**	**$169,193.00**
5	**Discount/Trade-ins**	**($280,937.50)**
	TOTAL	**$743,462.79**

PAYMENTS

The County shall pay each task order to the Contractor as follows:

1. Fifteen percent (15%) of the Total Task Price shall be due at the time of the Design review meeting
2. Thirty-Five (35%) percent of the Total Task Price shall be due upon Hardware shipment.
3. Fifteen (15%) percent of the Total Task Price shall be due upon completion of the Installation.
4. Twenty (20%) percent of the Total Task Price shall be due upon successful completion of "Acceptance Testing" as identified in the implementation plan.
5. Fifteen (15%) percent of the Total Task Price shall be due upon "Cutover" as identified in the implementation plan.

SCOPE OF WORK FOR TASK ORDER 3

- Implement the Palm Bay and Barefoot Bay sites of the South P25 Phase 2 Simulcast System with a redundant distributed control point.
- Design, installation, tower work, project management, acceptance testing, engineering, licensing and implementation plan for the two (2) sites.
- Install and cutover DC Power plant and antenna system for the two (2) sites.

ATTACHMENT I: TASK ORDER 4

ITEM	DESCRIPTION	PRICE
1	**North Cell Design – Rockledge**	**$385,850.12**
2	**North Cell Design – Cocoa Beach**	**$315,381.83**
3	**North Cell Hardware**	**$153,970.34**
4	**North Cell Installation**	**$167,026.80**
5	**Discount/Trade-ins**	**($275,248.00)**
	TOTAL	**$746,981.09**

PAYMENTS

The County shall pay each task order to the Contractor as follows:

1. Fifteen percent (15%) of the Total Task Price shall be due at the time of the Design review meeting
2. Thirty-Five (35%) percent of the Total Task Price shall be due upon Hardware shipment.
3. Fifteen (15%) percent of the Total Task Price shall be due upon completion of the Installation.
4. Twenty (20%) percent of the Total Task Price shall be due upon successful completion of "Acceptance Testing" as identified in the implementation plan.
5. Fifteen (15%) percent of the Total Task Price shall be due upon "Cutover" as identified in the implementation plan.

SCOPE OF WORK FOR TASK ORDER 4

- Implement the Rockledge and Cocoa Beach sites of the North P25 Phase 2 Simulcast System with a redundant distributed control point.
- Design, installation, tower work, project management, acceptance testing, engineering, licensing and implementation plan for the two (2) sites.
- Install and cutover DC Power plant and antenna system for the two (2) sites.

ATTACHMENT J: TASK ORDER 5

ITEM	DESCRIPTION	PRICE
1	**North Cell Design – Titusville**	**$435,850.12**
2	**North Cell Design – Scottsmoor**	**$315,381.83**
3	**North Cell Design – Sharpes**	**$315,381.83**
3	**North Cell Hardware**	**$230,955.50**
4	**North Cell Installation**	**$250,540.20**
5	**Discount/Trade-ins**	**($412,872.00)**
	TOTAL	**$1,135,237.48**

PAYMENTS

The County shall pay each task order to the Contractor as follows:

1. Fifteen percent (15%) of the Total Task Price shall be due at the time of the Design review meeting
2. Thirty-Five (35%) percent of the Total Task Price shall be due upon Hardware shipment.
3. Fifteen (15%) percent of the Total Task Price shall be due upon completion of the Installation.
4. Twenty (20%) percent of the Total Task Price shall be due upon successful completion of "Acceptance Testing" as identified in the implementation plan.
5. Fifteen (15%) percent of the Total Task Price shall be due upon "Cutover" as identified in the implementation plan.

SCOPE OF WORK FOR TASK ORDER 5

- Implement the Titusville, Scottsmoor, and Sharpes sites of the North P25 Phase 2 Simulcast System with a redundant distributed control point.
- Design, installation, tower work, project management, acceptance testing, engineering, licensing and implementation plan for the two (2) sites.
- Install and cutover DC Power plant and antenna system for the two (2) sites.