

**PALM BEACH COUNTY
BOARD OF COUNTY COMMISSIONERS
AGENDA ITEM SUMMARY**

<input type="checkbox"/> Consent	<input checked="" type="checkbox"/> Regular
<input type="checkbox"/> Ordinance	<input type="checkbox"/> Public Hearing

I. EXECUTIVE BRIEF

Summary: In April 2015, the Board approved the issuance of a Request for Proposal (RFP) for the County's P25 Trunked Simulcast Countywide Public Radio System Project. The Selection Committee selected Motorola as its recommended awardee in mid-July, and on September 1, 2015, the BCC ratified the selection, and authorized Staff to commence negotiations. This Contract identifies a Total System Price of \$20,173,096 which includes; 1) scope additions in the amount of \$939,014, 2) scope deletions in the deductive amount of \$325,744, 3) future purchases (which would have been required regardless of the vendor chosen) in the amount of \$1,454,113 that have been added to leverage the large system discount and saving the County an additional \$410,442, 4) all discounts offered in Motorola's response to the RFP in the deductive amount of \$8,400,000, and 5) Life Cycle Services (Software Support and Technology Refresh for 15 years) in the amount of \$3,275,227. The Total System Price is funded from the 800 MHz System Renewal/Replacement Fund except for \$564,436.53 which is being funded by Palm Beach County Fire Rescue (PBCFR). The Contract requires Final System Acceptance by June 1, 2017. The Contract also includes the form of, and pricing for, a Maintenance Service Agreement which will become effective upon Final Acceptance and extend for 16 years thereafter. Only the System Price is being funded as part of this approval as the System Maintenance Agreement will be executed and then encumbered on an annual basis as provided for in this Contract. Motorola is a global firm with US headquarters in Illinois. There is no SBE participation in this Contract and participation was not a requirement of the Request for Proposals due to lack of available vendors which can perform the work. **(FDO Admin) Countywide (MJ)**

On April 7, 2015, the BCC approved the RFP for the Palm Beach County Public Safety Radio System P25 Migration. On May 21, 2015, two proposals were received from Harris Corporation and Motorola Solutions Inc. Those two proposals were reviewed by a Technical Evaluation Committee (TEC) whose purpose was to review each vendor's proposal for compliance with the technical requirements of the RFP. In addition to the consultant, the TEC was comprised of technical and operational representatives of Facilities Development & Operations, Palm Beach County Fire Rescue and the Sheriff's Office. In addition to the proposals received, the vendors made presentations to the TEC and afterward the TEC prepared a report known as the Technical Evaluation Report. On July 16, 2015, the Selection Committee comprised of Bob Weisman, Fire Rescue Chief Jeff Collins and PBSO Major Ron Mattino met and considered the proposals Technical Evaluation Report, Financial Report, cost proposals, and references. The Selection Committee also heard presentations from the vendors. Based on pre-determined evaluation criteria, the firms were scored and Motorola was the highest ranked firm by the Selection Committee. On September 1, 2015, the BCC ratified the selection of Motorola as the selected vendor and authorized Staff to commence negotiations.

Contract is more than 50 pages
may be viewed in Minutes

y: jac

As may be
Department Director

11/3/15
Date


County Administrator

11/16/15
Date

II. FISCAL IMPACT ANALYSIS

A. Five Year Summary of Fiscal Impact:

Fiscal Years	2016	2017	2018	2019	2020
Capital Expenditures	\$20,173,096				
Operating Costs					
External Revenues					
In-Kind Match (County					
NET FISCAL IMPACT	\$20,173,096				
# ADDITIONAL FTE POSITIONS (Cumulative)					
Is Item Included in Current Budget:	Yes		No		
Budget Account No:	Fund 3801	Dept 411	Unit B595	Object 4907	
	1300	440	4219	6411	

B. Recommended Sources of Funds/Summary of Fiscal Impact:

Expenses associated with the System and the Total System Price will be funded from 1) the 800 MHz System Renewal/Replacement Fund which is made up of annual renewal/replacement contributions by PBSO, FR, county departments, cities who have direct connect agreements on the existing County system as well as PBSO generated \$12.50 funding (\$19,608,659.47), and 2) PBC Fire Rescue (\$564,436.53).

C. Departmental Fiscal Review:

III. REVIEW COMMENTS

A. OFMB Fiscal and/or Contract Development Comments:

OFMB Sherry Br Contract Development and Control A. J. Jacobson

B. Legal Sufficiency:

(Signature) Assistant County Attorney

C. Other Department Review:

Department Director

The following describes the services and pricing included in the negotiated contract.

Item	Description	Price
A	Total Turnkey System including Year 1 Warranty Service.	\$ 23,230,486
A-1	Additional System Features (Discounted Price Reflected) <ul style="list-style-type: none">Advanced Power Monitoring (11 sites) - \$225,209.00Infrastructure Presence Licenses (20,000) - \$30,000.00Infrastructure Location Licenses (10,000) - \$112,500.00Dual Polarization Microwave S-5 to S-25 - \$83,671.00TX Upgrade to S-25 - \$239,013.001 MCC7500 Console at S-21 - \$50,601.00ISSI connectivity to legacy P25 7.13 - \$100,669.001 MCC7500 Console at site S-25 – \$ 50,601.00P-25 Diagnostic Box - \$46,750.00	\$ 939,014
A-2	Scope Reductions <ul style="list-style-type: none">Upgrade existing consoles at S-30 (\$151,962)Eliminate new consoles at S-23 (\$173,782)	(\$325,744)
A-3	Future Purchase Items to leverage system discount (Discounted Price Reflected) <ul style="list-style-type: none">4 MCC7500 Consoles at S-15 – PBCFRD - \$ 213,764.28Flashes - \$1,201,522.50AIS for S-15 EM dispatch location. - \$38,827.00	\$1,454,113
A-4	Negotiated No Charge Items <ul style="list-style-type: none">Dynamic Talk Group and Dynamic Channel at 11 SitesCode plug developmentGap warranty for accelerated console installation	NC
B	System Incentives <ul style="list-style-type: none">Existing SmartZone System Trade-In Discount * \$ (2,500,000)P25 Master Site License Discount \$ (1,969,340)Large System Discount \$ (2,500,000)Customer Loyalty Discount \$ (800,000)Contract in 2015 Discount \$ (230,660)Technology Credit \$ (400,000) <p><i>*Final equipment trade in inventory to be determined by the County and made available following system acceptance. Motorola will not re-sell any trade-in equipment but will utilize trade-in equipment as appropriate to support legacy system maintenance. The trade-in incentives are not contingent upon actual trade in value.</i></p>	(\$8,400,000)
C	Life Cycle Agreement (Software Upgrade for Years 3, 6, 9, 12 and 15 and Technology Refresh for Years 6 and 12).	\$ 3,275,227
	Negotiated System Price	\$20,173,096
D	Maintenance Service Agreement for Years 2 through 16.	\$ 11,062,110
	Negotiated Contract Price	\$31,235,206

Item A-1 adds the following work to the scope required by the RFP.

- Advanced Power Monitoring (11 sites).The transmit antennas at the RF sites in the County’s existing SmartZone system are currently equipped with monitoring devices that are interfaced to the County’s Supervisory Control and Data Acquisition (SCADA) system thus allowing County’s radio maintenance personnel to be immediately alerted should any transmit antenna malfunction. This feature was not a requirement of the RFP, but as a beneficial monitoring feature currently in use by the County’s radio maintenance personnel, this feature needs to be maintained.
- Infrastructure Presenceand Location Licenses.As part of the RFP, vendors were asked to propose the required infrastructure equipment to support OTAR and GPS. Any system licenses required to support these features were not a requirement of the RFP. At system level, OTAR requires Presence licenses, and GPS requires both Presence and Location licenses. Taking into account the total number of direct connect and hub cities subscribers, and in order to leverage the system discount, the County has elected to add these system licenses.
- Dual Polarization Microwave S-5 to S-25. The County’s existing microwave path between S-5 and S-25 experiences fading due to changes in atmospheric conditions. As part of Motorola’s proposal, it was recommended by their subcontractor (Aviat) that the path between these two (2) sites be upgraded to space diversity to increase the reliability between these two (2) sites. The County has elected to increase the reliability of this microwave path by leveraging the space diversity option.

- TX Upgrade to S-25. The County's existing SmartZone radio system is comprised of ten (10) transmit/receive RF sites. As part of Motorola's proposal, Motorola guaranteed meeting the required coverage with nine (9) transmit/receive sites and one (1) receive only site. During contract negotiations, the County asked Motorola to provide coverage maps depicting Site S-25 as a transmit/receive site and as a receive only site, while individually failing each of the other nine (9) RF sites to determine if keeping Site S-25 as a transmit/receive site was advantageous. The coverage maps provided showed keeping Site S-25 as a transmit/receive site providing additional coverage should any one of the other RF sites failed. The County chose to maintain Site S-25 as a transmit/receive site, thus requested Motorola to upgrade this site.
- 1 MCC7500 Console at S-21. During the evaluation of the proposals, it was discovered that the number of dispatch consoles required at Site S-21 was incorrect by one (1). The RFP required that two (2) consoles be provided; however, Site S-21 currently has three (3) consoles and requires three (3) consoles.
- ISSI connectivity to legacy P25 7.13. An ISSI connection between the County's SmartZone 7.13 P25 core and the City of West Palm Beach's P25 system will greatly enhance interoperable communications between the County, the City and the MPSCC. As described in the Migration Path Recommendation Report, it was recommended that the County procure and implement an ISSI server for the County's current SmartZone system to coincide with the City's P25 system. The City of West Palm Beach is currently scheduled to migrate to its new P25 radio system by February 2016. Prior to issuance of the RFP, the Board of County Commissioners approved negotiations with Motorola for an ISSI server; however, at that time, the City had not migrated to its new P25 radio system. As part of the RFP, the County required two (2) ISSI servers; therefore, in lieu of procuring another ISSI server, the County will leverage one (1) of these servers and has requested Motorola to provide the services required to program and interface the ISSI server to the existing core.
- 1 MCC7500 Console at site S-25. For maintenance purposes, the County currently has a Gold Elite console at Site S-5 that is used to emulate consoles in the system. During the evaluation of the vendor's proposal, it was discovered that this console was not included. As one of the new cores will be installed at Site S-25, the replacement console will be installed at Site S-25 instead of Site S-5.
- P-25 Diagnostic Box. The DX-2002 DiagnostX Over-the-Air (OTA) Waveform Analyzer identifies, verifies and analyzes the alignment and field performance of all portable and mobile radios operating in the P25 radio system without user interaction while the radios are operational and deployed in the field. This test equipment will greatly assist County radio maintenance personnel with subscriber diagnostics; therefore, the County has elected to procure it.

Item A-2 eliminates equipment and services which are no longer required by the County.

- Consoles at S-30. This reduction eliminates the cost of acquiring MCC 7500 consoles which are already owned by the County (but were included in the RFP for replacement to level the playing field for selection purposes). The services required to upgrade those consoles to the same software version as the new consoles remains in the scope of the project.
- Consoles at S-23. The entire scope of work associated with the replacement of consoles at this site is being deleted due to the jurisdictions decision to no longer provide services from this location.

Item A-3 includes three separate purchases which the County would be required to purchase for various reasons, described below, prior to cut-over and have been included in this purchase to take advantage of the system discount offered in this Agreement. All of these items would have been required to be purchased regardless of the vendor chosen. By purchasing these items as part of this Contract, the County saved an additional \$410,442 for these same three (3) purchases.

- PBCFR Dispatch Consoles. Palm Beach County Fire Rescue requires four (4) additional consoles to expand its dispatch center to accommodate the additional services provided through the Countywide Centralized Dispatch Center. PBCFR provided the funding for this equipment (\$213,764.28).
- Radio Flash Kits. The RFP requirement for a 24-channel system with 10 channels configured for dynamic dual-mode Phase I/II operation was based upon providing comparable capacity (including future growth) to the County's current 28 channel system. In order for a 24-channel system to be comparable, it was determined that PBSO and PBCFR would need to migrate to Phase II operation on their talkgroups. To leverage the system discount provided with Motorola's proposal, the County has elected to procure the required flash kits to provide Phase II operation into PBSO and PBCFR subscribers. The Project is funding the flash upgrades for all PBSO and PBCFR radios which are capable of being upgraded to Phase II, as the RFP requirement mandated the work be completed. However, PBCFR is responsible for the costs of upgrading its P25 capable radios to Phase I operation (\$350,672.25). PBSO and PBCFR will remain responsible for funding new radios, replacement radios for those not capable of being upgraded to Phase II, and for installing additional programming into the radios to accommodate the new system functionality.

- AIS Server. The Archiving Interface Server (AIS) that is being purchased with the P25 system for the S-15 (EM) Dispatch Center provides an IP interface between the digital radio system and an agency provided logging recorder system. This server converts the P25 standard trunked audio to a usable format required by the logging recorder systems and that audio will also be provided to County entities (PBSO & PBCFR) and those municipal direct connect users which have a need to record their talk-groups. The current recording configuration is being provided by the central electronics banks (CEB's) that are being removed as part of this project. The Project is funding this server.

Item A-4 identifies three items that Motorola is providing at no-charge to the County.

Item B takes advantage of all of the system discounts contained in Motorola's response to the RFP.

Item C describes the 15 Year Life Cycle Services which includes software upgrades at Year 3, 6, 9,12, and 15, and Technology Refreshes in Years 6 and 12. The pricing contained in the Life Cycle Agreement is identical to that contained in Motorola's response to the RFP and will be encumbered at the time of Execution. Motorola will be paid for services according to the schedule contained in the Agreement.

Item D is the form of, and pricing for, a 15 Year Maintenance Service Agreement. The RFP required pricing for only the first 5 years after the warranty period, but Motorola, in its proposal, offered pricing escalated at 1.5% annually through Year 15 after warranty period. The pricing shown here is the pricing included in the RFP as well as Motorola's Security Update Service which is a service that was not required by the RFP but is currently received by the County through its current Maintenance Service Agreement and is a service that the County will continue to require. The Maintenance Service Agreement will be executed and become effective upon Final Acceptance of the System. When executed, the Maintenance Service Agreement will be encumbered on an annual basis as provided for in the agreement. The Maintenance Service Agreement may be terminated by the County with 90 day notice.

CONTRACT

THIS CONTRACT, made and entered into_____between

PALM BEACH COUNTY, a political subdivision of the State of Florida, hereinafter referred to as the "COUNTY" and MOTOROLA SOLUTIONS, INC., hereinafter referred to as the "CONTRACTOR" or "Motorola".

WITNESSETH:

That the said Contractor having been awarded the contract for the:

APCO P25 TRUNKED SIMULCAST
COUNTY WIDE PUBLIC SAFETY RADIO SYSTEM

PROJECT NUMBER – 14212

in accordance with the Request for Proposal therefore and for and in consideration of the promises and of the covenants and agreements, and of the payments herein specified, to be made and performed by the Contractor and the County, the Contractor hereby covenants and agrees to and with the County to undertake and execute all of the said named work, in a good, substantial and workmanlike manner, and to furnish and pay for all materials, labor , supervision, equipment, supplies, fees, expertise, and services necessary to fully complete all work in accordance with all requirements of the Contract Documents and in accordance with all applicable codes and governing regulations, within the time limit specified in the Scope of Work. The Contract Documents consist of the following documents which are incorporated herein by reference.

Contract

Appendix A - Contract Conditions

Appendix B - Motorola Software License

Appendix C - Negotiated Project Approach

Appendix D - Negotiated Price

Schedule A - Negotiated Payment Schedule

Motorola Proposal/Price proposal (Palm Beach County RFP 14212) Dated May 2015

RFP Exhibit B - Scope of Work / Technical Specification/Drawings/Plans Dated April 2015

Appendix E - Exhibit "D" to the RFP, Proposal Certification Form

Appendix F - Completed Bonds and Insurance Forms

Appendix G - Maintenance Terms and Conditions

Schedule A - Maintenance Statement of Work

Schedule B - Maintenance Pricing

Appendix H - Lifecycle Terms and Conditions

Schedule A - Lifecycle Statement of Work
Schedule B - Lifecycle Pricing

Governing Order of Contract Documents

The Contract Documents include various divisions, sections and conditions which are essential parts for the work to be provided by the successful Bidder. A requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete work. In case of discrepancy, the following precedence will govern the interpretation of the Contract Documents prior to award of the contract.

Contract

Appendix A - Contract Conditions

Appendix B - Motorola Software License

Appendix C - Negotiated Project Approach

Appendix D - Negotiated Price

Schedule A - Negotiated Payment Schedule

Motorola Proposal/Price proposal (Palm Beach County RFP 14212) Dated May 2015

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Schedule B - Maintenance Pricing

Appendix H - Lifecycle Terms and Conditions

Schedule A - Lifecycle Statement of Work

Schedule B - Lifecycle Pricing

After award, the Contract Forms, change orders, supplemental agreements, and revisions to plans and specifications will take precedence over any of the above. Detailed plans shall have precedence over general plans. In the event that any conflicts cannot be resolved by reference to this Governing Order of Contract Documents provision, then County shall resolve the conflict in accordance with this Contract.

Contractor agrees to accept as full compensation for the performance of this Contract the sum of \$16,897,869 for the System, \$3,275,227 for fifteen (15) years of Life Cycle Support Services as well as \$11,062,110 for fifteen (15) years of Maintenance Services. The total System Price is \$20,173,096, includes the System Life Cycle Support Services. The cost of all services agreed to pursuant to this Contract is \$31,235,206 (Contract Price). Maintenance Service Terms and Conditions are attached as Appendix G will be executed via purchase order at a later date and shall be effective as set forth therein.

The prices named in the Contract are for the completed work and all expense, direct or indirect, connected with the proper execution of the work and of maintaining the same until it is accepted by the Board of County Commissioners. It is understood that the Contractor holds and will maintain current appropriate registration, certification, and/or license for the purpose of performing the specified work pursuant to this Contract. The time limit for the Substantial Completion of all work under this contract shall be as stated in the Scope of Work and Special Conditions. The date fixing the beginning of this period upon the calendar shall be established and stated in the Notice to Proceed which will not exceed ten (10) days from the date of contract execution. In the event funds are not appropriated and budgeted in any fiscal year for payments due under this Contract, the Customer shall immediately notify Motorola of such occurrence and this Contract shall terminate on the last day of the fiscal year for which the appropriation was made without penalty. Customer shall pay for such Equipment or Services delivered or performed prior to the last day of the fiscal year for which appropriations were made.

IN WITNESS WHEREOF, the Board of County Commissioners of Palm Beach County, Florida, has made and executed this Contract on behalf of the said County and caused the seal of the said County to be affixed hereto, and the Contractor has hereunto set his hand and seal the day and year written. The Contractor represents that it is authorized to execute this contract on behalf of itself and its Surety.

ATTEST:

SHARON R. BOCK, Clerk & Comptroller

By: _____

Deputy Clerk

APPROVED AS TO FORM AND LEGAL
SUFFICIENCY

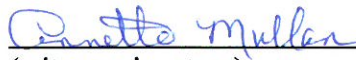
Assistant County Attorney



(witness signature)

STACY L. CHILD

(witness name printed)



(witness signature)

ANNETTE MULLAN

(witness name printed)

PALM BEACH COUNTY, FLORIDA, a
Political Subdivision of the State of Florida

BOARD OF COUNTY COMMISSIONERS

By: _____

Mayor

APPROVED AS TO TERMS AND
CONDITIONS


Director, Facilities Development &
Operations

CONTRACTOR

By Motorola Solutions, Inc., a Delaware
corporation

By: 

Marshall Wright

Its 

MSSSI Vice President/Director of Sales

(Corporate Seal)



MOTOROLA SOLUTIONS

Motorola Solutions, Inc.
1303 E. Algonquin Road, IL01, 12th Floor
Schaumburg, IL 60196 USA

CERTIFICATE OF ASSISTANT SECRETARY MOTOROLA SOLUTIONS, INC.

The undersigned certifies that he or she is a duly appointed Assistant Secretary of Motorola Solutions, Inc. (the "Company"), a corporation duly organized and existing under the laws of the State of Delaware, and that, as such, he or she is authorized to execute this Certificate on behalf of the Company, and further certifies that:

1. At a meeting of the Board of Directors of the Company held on May 6, 2014 at which a quorum was present and acting throughout, the following resolutions were duly adopted, effective May 6, 2014, have not been amended, and are in full force and effect on the date hereof:

RESOLVED, that all Appointed Vice Presidents be, and each one of them is, authorized to enter into and execute in the name of and on behalf of the Company all agreements, contracts, bids, proposals, deeds, assignments, powers of attorney, performance guarantees, performance guarantee undertakings, instruments, documents, claims, including claims against the United States, and certifications of such claims, in the ordinary course of business of the Company and related to his or her work as a Vice President of one of the Company's businesses, groups or corporate departments, all of which are collectively referred to as "Documents", provided that this authority does not extend to:

- a. Documents having a value in excess of \$10 million in the aggregate over the term of the arrangement; or
- b. Documents related to: (i) acquisitions, divestures, joint ventures and equity investments, (ii) supply chain procurement arrangements, (Appointed Vice Presidents in the Procurement Organization have authority for supply chain procurement arrangements in a specific Board resolution), (iii) outsourcing arrangements, (iv) customer financing extending more than 364 days, (v) capital expenditures, (vi) lease commitments, (vii) agreements and compensatory arrangements applicable to Motorola Solutions Appointed Vice Presidents and above, (viii) litigation and legal claims, (ix) appointing agents and attorneys-in-fact to represent the Company before any customs agency, (x) financial guarantees, financial surety agreements and financial guarantee undertakings, (xi) opening bank accounts, (xii) establishing borrowing relationships on behalf of the Company, and (xiii) voting or otherwise dealing with securities owned by the Company. Authority for such Documents is found in the specific resolutions below.

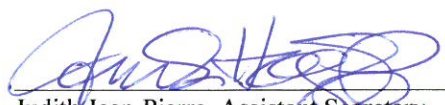
RESOLVED, that the Board has adopted specific resolutions authorizing the signing and execution by Appointed Vice Presidents of Documents related to supply chain procurement arrangements. Authority for such Documents is found in the specific resolutions below.

The officers named above are authorized to delegate this signature authority in writing to others.

2. The following person is a duly qualified and acting officer of the Company and has been duly elected to the office set forth opposite his or her name:

<u>Name</u>	<u>Title</u>
Jack Molloy	Senior Vice President

IN WITNESS WHEREOF, I have executed this Certificate as of this 5th day of November, 2015.


Judith Jean-Pierre, Assistant Secretary

SOP E-75 DELEGATION OF AUTHORITY

I, Jack Molloy, Senior Vice President of Motorola Solutions, Inc. ("Company") and its North America Government Sales & Product Operations ("Division") do hereby delegate my authority to approve and execute in the name of and on behalf of the Company, contract documents (pursuant to Company policy), to the below named individuals with the following dollar or other limitations as specified.

Delegation to approve and execute the Contract documents **for the** APCO P25 Trunked Simulcast County Wide Public Safety Radio System, Project No. 14212:

<u>Region:</u>	<u>To:</u>	<u>Value:</u>
North America	Marshall Wright	\$ 35,000,000

This Delegation of Authority granted herein shall not be delegable or assignable to any other person and shall expire on December 31, 2015.

The Authority delegated to the above-named individuals is in addition to the authority such individuals may have to approve and execute contract documents as an officer of the Company.

This Delegation can be revoked by me at any time and will automatically expire for any named individual if he or she ceases to be an employee of the Company or if he is assigned a different position within the Company. If a named individual is assigned a different position within the Company, the named successor is automatically given the designated authority unless a letter is provided stating otherwise.

IN WITNESS WHEREOF, I have executed this delegation of authority as of June 1, 2015.



Jack Molloy
Senior Vice President
North America Government Sales & Product Operations
Motorola Solutions, Inc.

PALM BEACH COUNTY

APPENDIX A - CONTRACT CONDITIONS

PROJECT NO.14212

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GENERAL CONDITIONS

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GENERAL CONDITIONS

GC-1 ENTIRE CONTRACT

This Contract embodies the entire agreement between County and Contractor and supersedes all other writings, oral agreements, or representations. The parties shall not be bound by or be liable for any statement, representation, promise, inducement or understanding of any kind or nature not set forth herein. No changes, amendments or modifications of any of the terms or conditions of the Contract shall be valid unless reduced to writing and signed by both parties.

GC-2 INDEPENDENT CONTRACTOR/USE OF SUBCONTRACTORS

Contractor represents that it is fully experienced and properly qualified to perform the class of work provided for herein, and that it is properly licensed, equipped, organized and financed to perform such work. Contractor shall act as an independent contractor and not as the agent of County in performing the Contract, maintaining complete control over its employees and all of its suppliers and subcontractors.

Nothing contained in this Contract or any subcontract awarded by Contractor shall create any contractual relationship between any such supplier or subcontractor and County. Contractor shall perform all work in accordance with its own methods subject to compliance with the Contract. Contractor represents that all subcontractor agreements entered into shall incorporate by reference the terms and conditions of this Contract, and further warrants that the County is an **intended express third party beneficiary** of any such subcontract. Except as specifically and expressly provided for herein, no provision of this Contract is intended to, or shall be construed to, create any third party beneficiary or to provide any rights to any person or entity not a party to this Contract.

GC-3 NOT USED – AUTHORIZED REPRESENTATIVES, REPLACED BY RFP EXHIBIT B SECTION 1

GC-4 NOTICES

Any notices provided for hereunder shall be in writing and may be served either personally on the authorized representative of the receiving party at the jobsite or by certified mail, or overnight courier with receipt, to that party at the addresses shown below:

OWNER:
Palm Beach County
Richard Avery, Project Manager
FDO - Capital improvements Division
2633 Vista Parkway,
West Palm Beach, FL 33458-5604

CONTRACTOR:

Judy Jean-Pierre, Senior Commercial Attorney
Legal, Government Affairs & Corporate Communications
1303 E. Algonquin Road, IL01-10th Floor
Schaumburg, IL 60196

These addresses may be changed by either of the parties by written notice to the other.

GC-5 LAWS AND REGULATIONS

Contractor and its employees and representatives shall at all times comply with all applicable laws, codes, ordinances, statutes, rules or regulations in effect at the time work is performed under this contract.

If, during the term of this Contract, there are any changed or new laws, ordinances or regulations not known or foreseeable at the time of signing this Contract which become effective and which affect the cost or time of performance of the Contract, Contractor shall promptly notify County in writing and submit detailed documentation of such effect in terms of both time and cost of performing the Contract. Upon concurrence by County and Contractor as to the effect of such changes, an adjustment in the compensation and/or time of performance will be made.

If any discrepancy or inconsistency should be discovered between the Contract and any law, ordinance, regulation, order or decree, Contractor shall promptly report the same in writing to County who will issue such instructions as may be necessary.

However, it shall not be grounds for a Change Order that the Contractor was unaware of or failed to investigate the rules, codes, regulations, statutes, and all ordinances of all applicable governmental agencies having jurisdiction over the Project or the work.

County shall not be liable to the other for any costs, delays or damages which it incurs as a result of the actions or orders of any other governmental entity or agency.

GC-6 STANDARDS AND CODES

Wherever references are made in the Contract to standards or codes in accordance with which work is to be performed or tested, the edition or revision of the standards or codes current on the effective date of this Contract shall apply, unless otherwise expressly set forth. Unless otherwise specified, reference to such standards or codes is solely for implementation of the technical portions of such standards and codes. In case of conflict among any referenced standards and codes or between any referenced standards and codes the County will determine which shall govern. Contractor acknowledges that compliance with code requirements represents minimum standards for construction and is not evidence that the work has been completed in accordance with the Contract Documents.

GC-7 CODE RELATED INSPECTIONS

The Contractor recognizes that the Palm Beach County Department of Planning, Zoning, and Building (PZ&B) is a separate department within the County that that is charged with the

inspection of improvements to real property for code compliance. If the improvements to be made by the Contractor pursuant to this contract will be subject to inspection by PZ&B, the Contractor agrees that it will not assert as a County caused delay or as a defense of any delay on the part of the Contractor, any good faith action or series of actions on the part of PZ&B, including, but not limited to PZ&B's refusal to accept any portion of the Contractor's work.

GC-8 GOVERNING LAW

The Contract shall be governed by the laws of the State of Florida and venue of any action shall be in Palm Beach County, Florida.

GC-9 RIGHTS AND REMEDIES

The duties and obligations imposed by the Contract Documents and the rights and remedies available there under shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

Except as specifically and expressly provided for herein, no provision of this Contract is intended to, or shall be construed to, create any third party beneficiary or to provide any rights to any person or entity not a party to this Contract.

GC-10 COMMERCIAL ACTIVITIES

Contractor shall not establish any commercial activity or issue concessions or permits of any kind to third parties for establishing commercial activities on lands owned or controlled by County. Contractor shall not allow its employees to engage in any commercial activities on the site that is not authorized by this Contract.

GC-11 COOPERATION WITH OTHERS

County and other contractors and subcontractors may be working at the site during the performance of this Contract. Contractor shall fully cooperate with the County, the County's designated Representative, and other contractors to avoid any delay or hindrance of their work. County may require that certain facilities be used concurrently by Contractor and other parties and Contractor shall comply with such requirements.

If any part of the Contractor's work depends on proper execution or results from any work performed by the County or any separate contractor, the Contractor shall, prior to proceeding with the work, promptly report to the County any apparent discrepancies or defects in such other work that render it unsuitable for such proper execution and results. Failure of the Contractor to report such discrepancies or defects shall constitute an acceptance of the County's separate contractors' work as fit and proper to receive his work, except as to defects which may subsequently become apparent in such work performed by others. Any costs caused by defective or ill-timed work of others shall be borne by the Contractor unless Contractor gives written notice to County, if reasonably possible, prior to proceeding with the work and in any event within five days of commencement of work. In no event shall the County be liable to the Contractor for delay damages, except as provided for in the Contract Documents.

GC-12 FORMS AND DOCUMENTS

The below listed documents will be provided by the County and are to be used by the Contractor and County during the administration of this contract. Additional administrative forms may supplement this list upon written notice by the County (or County's project representative). County reserves the right to modify these forms as it deems necessary. Contractor shall maintain logs for Items A-K and provide to County monthly.

- A. Request for Information
- B. Field Instruction
- C. Field Bulletin
- D. Construction Change Proposal
- E. Change Order
- F. Construction Change Directive
- G. Submittal Transmittal
- H. Deficiency Report
- I. Non-Conformance Report
- J. Contractor's Daily Report
- K. Substitution Request Form

GC-13 PUBLICITY AND ADVERTISING

Contractor shall not make any announcement or release any information or publish any photographs concerning this Contract or the project or any part thereof to any member of the public, press or any official body, unless prior written consent is obtained from County.

GC-14 TAXES

Contractor shall pay all taxes, levies, duties and assessments which may be applicable to any work under this Contract for which it is legally responsible. The Contract Sum and any agreed variations thereof shall include all taxes imposed by law. Contractor shall make any and all payroll deductions required by law. Contractor herein indemnifies and holds the County harmless from any liability on account of any and all such taxes, levies, duties, assessments and deductions. The inclusion of applicable sales or similar taxes in the Contract System Price is conditioned upon the County maintaining in good standing for the duration of the Contract a Consumer's Certificate of Exemption issued by the Florida Department of Revenue that exempts the County from the payment of Florida sales and use tax on real property rented, transient rental property rented, tangible personal property purchased or rented, or services purchased.

GC-15 FEES

County will be responsible for the following fees associated with this project: utility connection fees, utility installation fees (including FPL), and water meter charges except for fees associated with Contractor mobilization which have not been waived by County. Contractor shall advise County ten (10) days in advance of requirement for the fee. Water and/or sanitary sewer service capacity charges will also be paid directly by the County. There are no impact fees pursuant to this project.

GC-16 UTILITIES

The Contractor shall, at its expense, arrange for, develop and maintain all utilities in work areas to meet the requirements of the Contract. Such utilities already in existence at the work areas shall be provided to Contractor at no additional cost by the County, and shall include, but not be limited to, the following:

- A. Construction power as required at each point of construction.
- B. Water as required throughout the construction.

Prior to final acceptance of the work the Contractor shall, at its expense, remove and dispose of all temporary utilities developed to meet the requirements of the contract.

GC-17 SUCCESSORS, ASSIGNS AND ASSIGNMENT

The County and the Contractor each binds itself, its officers, directors, qualifying agents, partners, successors, assigns and legal representatives to the other party hereto and to the partners, successors, assigns and legal representatives of such other party in respect to all covenants, agreements and obligations contained in the Contract. It is agreed that the Contractor shall not assign, transfer, convey or otherwise dispose of the contract or its right, title or interest in or to the same or any part thereof, or allow legal action to be brought in its name for the benefit of others, without previous consent of the County and concurred to by the sureties.

GC-18 EXAMINATION OF CONTRACTOR'S RECORDS

The County shall, until the expiration of four years after final payment under this Contract, have access to, and the right to examine any directly pertinent books, documents, papers and records of the Contractor involving transactions relating to this Contract, and to make copies, excerpts and transcriptions thereof. Motorola will not be required to provide its confidential and proprietary cost or pricing data. Nothing herein shall limit the rights of the Palm Beach County Office of the Inspector General, as set forth in Special Condition 20 and Palm Beach County Code Section 2-221 to 2-432, as may be amended.

GC-19 COORDINATION AND CORRELATION OF DRAWINGS AND SPECIFICATIONS

The Contractor represents that the Contractor, Subcontractors, material and equipment suppliers have compared Scope of Work and Drawings and have compared and reviewed all general and specific details on the Drawings and that all conflicts, discrepancies, errors and omissions, which are within the commonly accepted knowledge base of a licensed general contractor, subcontractors, trades persons, manufacturers or other parties required to carry out the Work involved in this Contract, have been either corrected or clarified prior to execution of this Contract.

The Contractor represents that the Contract Sum represents the total cost for complete and functional systems and therefore, the Contractor's review and comparison has taken into consideration the total and complete functioning of all systems.

GC-20 NOT USED – PERMIT DRAWINGS AND SPECIFICATIONS, REPLACED BY RFP EXHIBIT B, SECTION 1.6.4

GC-21 CONTRACT INTERPRETATION

All claims of Contractor and all questions the Contractor may have concerning interpretation or clarification of this Contract or its acceptable fulfillment shall be submitted immediately in writing to County for resolution. County, or its representatives, will render its determination concerning such resolution, which determination shall be considered final and conclusive unless Contractor files a written protest pursuant to GC-22 "Disputes". The Contractor's protest shall state clearly and in detail the basis thereof. County will consider Contractor's protest and render its decision thereon within twenty-one (21) calendar days. If Contractor does not agree with the County's decision, the Contractor shall immediately deliver written notice to that effect to the County.

Contractor is solely responsible for requesting instructions or interpretations and is solely liable for any cost and/or expenses arising from its failure to do so. Contractor's failure to protest County's determinations, instructions, clarifications or decisions within thirty (30) calendar days after receipt thereof shall constitute a waiver by Contractor of all its rights to further protest, except for seeking judicial relief.

GC-22 DISPUTES

Any dispute relating to a question of fact arising under this Contract shall be resolved through good faith efforts upon the part of Contractor and County or its representatives. At all times, Contractor shall carry on the work and maintain its progress schedule in accordance with the requirements of the Contract and the determination of the County or its representatives, pending resolution of any dispute. Any dispute that is not disposed of by mutual agreement shall be decided by the County or its representatives who shall reduce such decision to writing. The decision of the County or its representatives shall be final and conclusive. Contractor's failure to protest County's determinations, instructions, clarifications or decisions within fourteen (14) calendar days after receipt thereof shall constitute a waiver by Contractor of all its rights to further protest, except for judicial relief.

GC-23 SUSPENSION

County may, at its sole option, decide to suspend at any time the performance of all or any portion of work to be performed under the Contract. Contractor will be notified of such decision by County promptly in writing. Such notice of suspension of work may designate the amount and type of plant, labor and equipment to be committed to the work site. During the period of suspension, Contractor shall use its best efforts to utilize its plant, labor and equipment in such a manner as to minimize costs associated with suspension.

A. Upon receipt of any such notice, Contractor shall, unless the notice requires otherwise:

1. immediately discontinue work on the date and to the extent specified in

the notice;

2. place no further orders or subcontracts for material, services, or facilities with respect to suspended work other than to the extent required in the notice;
 3. promptly make every reasonable effort to obtain suspension, upon terms satisfactory to County, of all orders, subcontracts and rental agreements to the extent they relate to performance of work suspended;
 4. continue to protect and maintain the work including those portions on which work has been suspended, and
 5. take any other reasonable steps to minimize costs associated with such suspension.
- B. As full compensation for such suspension, Contractor will be reimbursed for the following verifiable costs, without duplication of any item, to the extent that such costs directly result from such suspension of work:
1. A standby charge to be paid to Contractor during the period of suspension of work which standby charge shall be sufficient to compensate Contractor for keeping, to the extent required in the notice, its organization and equipment committed to the work in a standby status;
 2. All reasonable costs associated with mobilization and demobilization of Contractor's plant, forces and equipment;
 3. An equitable amount to reimburse Contractor for the cost of maintaining and protecting that portion of the work upon which work has been suspended; and
 4. If as a result of any such suspension of work the cost to Contractor of subsequently performing work is increased or decreased, an equitable adjustment will be made in the cost of performing the remaining portion of work.

In no event shall the Contractor be entitled to assert a claim for home office overhead in accordance with the Eichleay Formula or otherwise, in the event of a County suspension. Upon receipt of notice to resume suspended work, Contractor shall immediately resume performance of the suspended work to the extent required in the notice. Any claim on the part of Contractor for time and/or compensation arising from suspension shall be made within twenty-one (21) calendar days after receipt of notice to resume work and Contractor shall submit for review a revised construction schedule. No adjustment shall be made for any suspension to the extent that performance would have been suspended, delayed, or interrupted by any Contractor's non-compliance with the requirements of this Contract. If project suspension exceeds 180 days the County and Motorola will agree on costs to complete.

GC-24 DECLARATION OF DEFAULT

The failure of the Contractor to supply enough properly skilled workers or material, or to make prompt payment to Subcontractors or for materials or labor or to obey laws, ordinances, rules, regulations or orders of public agencies having jurisdiction, or to comply in any way with the Contract Documents, shall be sufficient grounds for the County to find the Contractor in substantial default and that sufficient cause exists to terminate the Contract and to withhold payment or any part thereof until the cause or causes giving rise to the default has been eliminated by the Contractor and approved by the County. If a finding of default is made, the Contractor and its Surety shall remain responsible for performance of the requirements of the Contract Documents unless and until the County terminates the Contract. Upon a finding of default, the County shall set a reasonable time, within which the Contractor and its Surety shall eliminate the cause or causes of default. When the basis for finding of default no longer exists, the County shall notify the Contractor and its Surety in writing that the default has been corrected and that the Contractor is no longer in default. If the Contractor fails to correct the default within the time allowed, the County may terminate the Contract and the employment of the Contractor, without otherwise waiving its rights against the Contractor or its Surety.

GC-25 TERMINATION FOR DEFAULT

Notwithstanding any other provisions of this Contract, Motorola shall be considered in default of its contractual obligation under this contract if it:

1. Performs work which fails to conform to the requirements of this Contract;
2. Fails to meet the Project Schedule or fails to make progress so as to endanger performance of this Contract;
3. Abandons or refuses to proceed with any or all work including modifications directed pursuant to GC-65, Changes; or
4. Fails to fulfill any of the terms of this Contract.

Upon the occurrence of any of the foregoing, County or its project representatives shall notify Motorola in writing of the nature of the failure and of County's intention to either terminate the Contract for default, or to declare Motorola to be in default and make demand upon its Surety to perform, at its sole option.

If Motorola or its Surety(ies) do not cure such failure within thirty (30) calendar days from receipt of notification, or sooner if consideration of safety to persons is involved, or if Motorola or its Surety(ies) fails to provide evidence that such default will be corrected, County may, without notice to Motorola's Surety(ies), if any, terminate in whole or in part Motorola's right to proceed with work by written notice and prosecute the work to completion by contract or by any other method deemed expedient.

If Motorola fails to cure the default, the County may terminate any unfulfilled portion of this Contract. If the County completes the Communications System through a third party, the County

may recover the reasonable costs of completing the Communications System to a capability not exceeding that specified in this Contract, less the unpaid portion of the Contract Price. The County agrees to use reasonable efforts to mitigate such costs.

Motorola and its sureties, if any, shall be liable jointly and severally for all costs in excess of the contract price for such terminated work reasonably and necessarily incurred in the completion of the work as scheduled, including reasonable cost of administration of any contract awarded to others for completion and for Liquidated Damages. Upon termination for default Motorola shall:

Immediately discontinue work on the date and to the extent specified in the notice and place no further purchase orders or subcontracts to the extent that they relate to the performance of work terminated;

1. Inventory, maintain and turn over to County all materials, plant, tools, equipment, and property furnished by Motorola or provided by County for performance of work;
2. Promptly obtain cancellation upon terms satisfactory to County of all purchase orders, subcontracts, rentals, or any other agreements existing for performance of the terminated work or assign those agreements to County as directed;
3. Cooperate with County in the transfer of information and disposition of work in Progress so as to mitigate damages;
4. Comply with other reasonable requests from County regarding the terminated work; and
5. Continue to perform in accordance with all of the terms and conditions of the Contract such portion of work that is not terminated.

If, upon termination pursuant to this clause, it is determined for any reason that Motorola was not in default, the rights and obligations of the parties shall be the same as if the notice of termination had been issued pursuant to GC-26, Optional Termination.

GC-26 OPTIONAL TERMINATION

County may, at its option, terminate the Contract, in whole or in part at any time by written notice thereof to Motorola, whether or not Motorola is in default. Upon any such termination, Motorola hereby waives any claims for loss of anticipated profits, on account thereof, but as the sole right and remedy of Motorola, County shall pay Motorola in accordance with Subparagraphs below, provided, however, that those provisions of the Contract which by their very nature survive Final Acceptance under the Contract shall remain in full force and effect after such termination.

1. Upon receipt of any such notice, Motorola and its Surety shall, unless the notice requires otherwise:
 - a. Immediately discontinue work on the date and to the extent specified in the notice;

- b. Place no further orders or subcontracts for materials, services, or facilities, other than as may be necessary or required for completion of such portion of work under the Contract that is not terminated;
 - c. Promptly make every effort to obtain cancellation upon terms satisfactory to County of all orders and Subcontracts to the extent they relate to the performance of work terminated or assign to County those orders and subcontracts and revoke agreements specified in such notice;
 - d. Motorola agrees to assign all Subcontracts required for performance of this Contract to the County;
 - e. Motorola shall include in all Subcontracts, equipment leases and purchase order, a provision requiring the Subcontractor, equipment lessor or supplier, to consent to the assignment of their Subcontract to the County;
 - f. Assist County, as reasonably requested in writing, in the maintenance, protection, and disposition of property acquired by County under the Contract; and
 - g. Complete performance of any work which is not terminated.
2. Upon any such termination, County will pay to Motorola, an amount determined in accordance with the following (without duplication of any item):
- a. All amounts due and not previously paid to Motorola for all costs incurred, Equipment shipped and services rendered up to the date of such notice, and for work thereafter completed as specified in such notice.
 - b. The cost of settling and paying claims arising out of the termination of work under subcontracts or orders as provided in Subparagraph 1.c above.
 - c. The verifiable costs incurred pursuant to GC-65, Changes.
 - d. Any other costs which can be verified to be incidental to such termination of work.

The foregoing amounts will include a sum, under all of the circumstances, as profit for all conforming work performed by Motorola.

Motorola shall submit within three (3) months after receipt of notice of termination, a proposal for an adjustment to the contract price including all incurred costs described herein. County shall review, analyze, and verify such proposal, and the Contract shall be amended in writing accordingly.

GC-27 SCHEDULE GUARANTY & EXTENSION OF TIME/NO DAMAGES FOR DELAY

County and Motorola agree that the timely delivery of the System as specified in this Contract is the essence of this Contract. Motorola agrees that in the event that it does not complete Final System Acceptance in a timely manner, Motorola shall, at no cost to the County, supplement the obligations in the County's existing SmartZone Trunked Maintenance Service Agreement (MSA) with sufficient parts (even if identified as end of life (EOL) parts in the MSA) until such time that Motorola has achieved Final System Acceptance. Prior to making this commitment, Motorola conducted an evaluation of the County's inventory of EOL parts and has determined that between the County's inventory and whatever other inventory (refurbished or new) Motorola can access from other sources, it will be able to comply with the required repair response times stated in the MSA. The County agrees to make its inventory available to Motorola for this purpose and agrees to only use inventory for repair of the County's system and to not otherwise dispose of any EOL part prior to Motorola achieving Conditional Acceptance #2.

Motorola agrees to the assessment of the following damages for failed testing/cutovers, and failure to meet delivery dates as set forth in Appendix C Negotiated Project Approach, Section 7.6.2 Project Schedule:

1. Actual Customer expenses (County's and any of its Hub Partners and/or Direct Connect Partners) for Motorola's failure to successfully complete a scheduled FATP or SATP;
2. Actual Customer's expenses (County's and any of its Hub Partners and/or Direct Connect Partners) for Motorola's failure to successfully complete a scheduled CATP;
3. Liquidated damages of \$15,000 per occurrence, \$30,000 maximum, for failed testing and cutovers as defined in the Contract. An occurrence is each instance when the Cutover Plan is stopped after commencement. After two (2) occurrences, Motorola will prepare, at its cost, a detailed remedial plan for achieving a successful testing and cut-over meeting the requirements of this Contract. The detailed remedial plan will include, but is not limited to, the timeframe for achieving compliance, any work required to the existing system to maintain operations while the remedial plan is being implemented, and any costs associated with implementing the plan and the responsible party. The County may accept the remedial plan as-is, or as may be modified and agreed to by the parties, or exercise any other remedies it may have pursuant to this Contract to ensure performance.
4. Liquidated damages of \$1500/day for each day Motorola fails to achieve Substantial Completion #3 by the scheduled Contract Date of June 1 2017, and

after thirty (30) days, the Parties will have to agree to an alternate plan and amount of damages which recognizes the impact of the delay to the County. However, if Motorola is late because of failed cutovers and there is a remedial plan in place, the remedial plan will govern all specified liquidated damages.

5. All cumulative actual expenses and liquidated damages assessed against Motorola in accordance with this General Condition 27 shall not exceed 1.5% of the Contract Price. This limitation on damages shall not apply to the costs of any remedial plan created pursuant to this General Condition 27, nor shall it apply to an additional actual expense or liquidated damages set forth in the remedial plan. The System Price excludes Maintenance costs. If Motorola's performance of this Contract is delayed, which delay is beyond the control and without the fault or negligence of Motorola or its Subcontractors, or by changes ordered in the Work, and in either event where such delay or change in the work impacts the Critical Path, then the Project Schedule shall either be extended by Change Order or an equitable adjustment and Motorola will not incur actual or liquidated damages. If Motorola's performance of this Contract is delayed as a result of Motorola or its subcontractors fault or negligent and in the event where such delay impacts the Critical Path, then Motorola shall execute the necessary remedial actions as part of the Contract Price. The foregoing paragraph applies to delays discovered through progress review meetings or the computer generated calendar dated schedule update.

Motorola must request the extension of time in writing and must provide the following information within the time periods stated hereafter. Failure to submit such information and in compliance with the time requirements hereinafter stated shall constitute a waiver by Motorola and a denial of the claim for extension of time.

1. Nature of the delay or change in the work;
2. Dates of commencement/cessation of the delay or change in the work;
3. Activities on the current progress schedule affected by the delay or change in the work;
4. Identification and demonstration that the delay or change in work impacts the CRITICAL PATH;
5. Identification of the source of delay or change in the work;
6. Anticipated impact, extent of the delay, or change in the work; and
7. Recommended action to minimize the delay.

If County (including its other contractors) delays the critical path of the Performance Schedule, the Parties will execute a change order to extend the Performance Schedule and, if requested, compensate Motorola for all reasonable charges incurred because of the delay. Delay charges may include costs incurred by Motorola or its subcontractors for additional freight, warehousing and handling of Equipment; extension of the warranties; travel; suspending and re-mobilizing the work; additional engineering, project management, and standby time calculated at then current rates; and preparing and implementing an alternative implementation plan.

Motorola shall not be entitled to any extension of time for delays resulting from any cause unless it shall have notified the County in writing within twenty-four hours (24) after the commencement of such delay or 96 hours of knowledge of a potential delay, whichever is later.

Neither Party will be liable for its non-performance or delayed performance if caused by a Force Majeure. A Party that becomes aware of a Force Majeure that will significantly delay performance will notify the other Party promptly (but in no event later than three days) after it discovers the Force Majeure. If a Force Majeure occurs, the Parties will execute a change order to extend the Performance Schedule for a time period that is reasonable under the circumstances.

Motorola hereby affirms that the extension of time granted herein is Motorola's sole and exclusive remedy. Apart from extension of time, no payment of claim for damages shall be made to Motorola as compensation for damages for any delays from any cause whatsoever in the progress of the Work whether such delay be avoidable or unavoidable.

For all changes in the Work for which Motorola claims entitlement to a time extension, Motorola shall provide to the County the same information as required above within fourteen (14) working days of the issuance of the request for change order or direction to change the Statement of the work, and Motorola's failure to provide such information shall constitute a waiver by Motorola and a denial of any time extension for that change in the work. Further, upon execution by the County and Motorola of any Change Order where no time extension has been requested or granted, that Change Order shall constitute a complete waiver of claims by either party for dollars required to perform the change order work or for any extension of time related only to that particular change order.

Motorola recognizes that the Palm Beach County Department of Planning, Zoning, and Building (PZ&B) is a separate department within the County charged with the inspection of improvements to real property. Some of the improvements to be made by Motorola pursuant to this Contract will be subject to inspection by PZ&B. Motorola agrees that it will not assert, as a County caused delay or as a defense of any delay on the part of Motorola, any good faith action or series of actions on the part of PZ&B, including, but not limited to PZ&B's refusal to accept any portion of Motorola's work. Motorola will receive a reasonable extension to the Project Schedule for delays caused by PZ&B; provided that the delay caused by PZ&B is not due to Motorola's insufficient or incomplete paperwork, or work which fails to comply with any permit requirement.

GC-28 NOT USED – WARRANTY, REPLACED BY RFP EXHIBIT B SECTION 13.2

GC-29 PATENT INDEMNITY

Contractor hereby indemnifies and shall defend and hold County and its representatives harmless from and against all claims, losses, costs, damages, and expenses, including reasonable attorney's fees, incurred by County, respectively, as a result of or in connection with any claims or actions to the extent it is based on a third-party claim alleging that the Equipment manufactured by Motorola or the Motorola Software ("Motorola Product") directly infringes a United States patent or copyright ("Infringement Claim"). Motorola's duties to defend and indemnify are conditioned upon: Customer promptly notifying Motorola in writing of the Infringement Claim; Motorola having sole control of the defense of the suit and all negotiations for its settlement or compromise; and Customer providing to Motorola cooperation and, if requested by Motorola, reasonable assistance in the defense of the Infringement Claim. In addition to Motorola's obligation to defend, and subject to the same conditions, Motorola will pay all damages finally awarded against Customer by a court of competent jurisdiction for an Infringement Claim or agreed to, in writing, by Motorola in settlement of an Infringement Claim.

Contractor shall, at its sole expense, promptly defend against any suit unless directed otherwise by County or its representatives; provided that County or its representatives shall have promptly notified Contractor upon becoming aware of such claims or actions, and provided further that Contractor's aforementioned obligations shall not apply to equipment, materials, or processes furnished, combined with, or specified by County or representatives. Contractor shall have the right, in order to avoid such claims or actions, to substitute at its expense non-infringing equipment, materials, or processes, or to modify such infringing equipment, materials and processes so they become non-infringing, or obtain the necessary licenses to use the infringing equipment, material or processes, provided that such substituted and modified equipment, materials and processes shall meet all the requirements and be subject to all the provisions of this Contract. Providing the functionality of the system is not negatively impacted as determined by the County, if neither of the foregoing is viable, then Contractor will refund the amount of the infringing product or item.

Motorola will have no duty to defend or indemnify for any Infringement Claim that is based upon: (a) the combination of the Motorola Product with any software, apparatus or device not furnished by Motorola; (b) the use of ancillary equipment or software not furnished by Motorola and that is attached to or used in connection with the Motorola Product; (c) Motorola Product designed or manufactured in accordance with Customer's designs, specifications, guidelines or instructions, if the alleged infringement would not have occurred without such designs, specifications, guidelines or instructions; (d) a modification of the Motorola Product by a party other than Motorola; (e) use of the Motorola Product in a manner for which the Motorola Product was not designed or that is inconsistent with the terms of this Contract; or (f) the failure by Customer to install an enhancement release to the Motorola Software that is intended to correct the claimed infringement.

GC-30 INDEMNITY

Contractor shall indemnify and hold harmless the County and its officers and employees, from liabilities, damages, losses and costs, including, but not limited to, reasonable attorney's fees, to the extent caused by the negligence, recklessness, or intentional wrongful misconduct of

Contractor and persons employed or utilized by the indemnifying party in the performance of this contract.

Contractor further agrees to hold harmless and indemnify County for any fines, citations, court judgments, insurance claims, restoration costs or other liability resulting from and caused by Contractor's activities on the project.

Said indemnification by Contractor shall be extended to include all deliverers, suppliers, furnisher of material or anyone acting for, on behalf of, or at the request of Contractor. Contractor recognizes the broad nature of this indemnification and hold harmless clause and voluntarily makes this covenant. This clause shall survive termination of this Contract.

GC-31 INSURANCE

Unless otherwise specified in this Contract or granted by County Risk Management Division, the Contractor shall, at its sole expense, maintain in full force and effect at all times during the life of this contract or the performance of work hereunder, insurance coverage as described herein at limits, including endorsements, set forth in the Insurance Coverage & Limit Table below. Contractor shall deliver to County Certificate(s) of insurance per the terms of this Contract evidencing that such policies are in full force and effect, not later than fourteen (14) calendar days after receipt of Notification of Intent to Award, but in any event, prior to execution of the Contract by County and prior to commencement of work on the project. Such certificate(s) shall adhere in every respect to the conditions set forth herein.

The requirement contained herein as to types and limits, as well as County approval of insurance coverage to be maintained by Contractor are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by Contractor under the Contract.

COMMERCIAL GENERAL LIABILITY. Contractor agrees to maintain a standard ISO version Commercial General Liability policy form, or its equivalent providing coverage for, but not be limited to, Bodily Injury and Property Damage, Premises/Operations, Products/Completed Operations, Independent Contractors, Contractual Liability, Broad Form Property Damage, X-C-U Coverages (if applicable), Severability of Interest including Cross Liability, and be in accordance with all of the limits, terms and conditions set forth herein. Contractor agrees this coverage shall be provided on a primary basis.

BUSINESS AUTOMOBILE LIABILITY. Contractor agrees to maintain a standard ISO version Business Automobile Liability coverage form, or its equivalent, providing coverage for all owned, non-owned and hired automobiles, and in accordance with all of the limits, terms and conditions set forth herein. Contractor agrees this coverage shall be provided on a primary basis. Notwithstanding the foregoing, should the Contractor not own any automobiles, the business auto liability requirement shall be amended to allow the Contractor to agree to maintain only Hired & Non-Owned Auto Liability. This amended coverage requirement may be satisfied by way of endorsement to the Commercial General Liability, or separate Business Auto Coverage form.

WORKER'S COMPENSATION & EMPLOYER'S LIABILITY. Contractor agrees to maintain Worker's Compensation Insurance & Employers Liability coverage. This coverage

shall be accordance with all of the limits, terms and conditions set forth herein. Exemptions for a Contractor in or doing work in the Construction Industry, or proof of worker's compensation coverage provided by an employee leasing arrangement shall not satisfy this requirement. If any work is sublet Contractor shall require all subcontractors to similarly comply with this requirement unless such subcontractors' employees are covered by Contractor's Worker's Compensation insurance policy. Contractor agrees this coverage shall be provided on a primary basis.

INSTALLATION FLOATER INSURANCE. With respect to property with values in excess of \$100,000 which is rigged, hauled or situated at the site pending installation, coverage shall be provided in accordance with all of the limits, terms and conditions set forth herein. Contractor agrees this coverage shall be provided on a primary basis. The Contractor agrees and understands the County shall not provide any inland marine or transit insurance on behalf of Contractor for loss or damage to work, or to any other property of owned, hired, or borrowed by the Contractor.

ADDITIONAL INSURED. The Contractor agrees to include the County and Palm Beach County Board of County Commissioners as Additional Insured on CGL insurance policies via a blanket additional insured endorsement. The Contractor agrees the Additional Insured endorsements provide coverage on a primary basis. Endorsement shall be in accordance with all of the limits, terms and conditions set forth herein.

LOSS PAYEE. The Contractor agrees to include the County and Palm Beach County Board of County Commissioners as a Loss Payee on the Installation Floater's Insurance, when required to be maintained by the Contractor. Endorsement shall be in accordance with all of the limits, terms and conditions set forth herein. The Contractor agrees the Loss Payee endorsement provides coverage on a primary basis.

WAIVER OF SUBROGATION. The Contractor agrees by entering into this Contract to a Waiver of Subrogation for Worker's compensation.

The Contractor agrees by entering into this Contract to a Waiver of Subrogation for Worker's Compensation for each required policy providing coverage during the life of this Contract. When required by the insurer or should a policy condition not permit an Insured to enter into an pre-loss agreement to waive subrogation without an endorsement, then the Contractor agrees to notify the insurer and request the policy be endorsed with a Waiver of Transfer of Rights of Recovery Against Others, or its equivalent. This Waiver of Subrogation requirement shall not apply to any policy, which a condition to the policy specifically prohibits such an endorsement, or voids coverage should the insured enter into such an agreement on a pre-loss basis. The Waiver of Subrogation shall be in accordance with all of the limits, terms and conditions set forth herein. A waiver of subrogation for Auto and GCL will be conditioned upon a determination by the insurer that the County and its representatives (other than Contractor) were not the party(ies) at fault.

NO REPRESENTATION OF COVERAGE ADEQUACY: The coverages and limits identified in the table have been determined to protect primarily interests of the County only, and the Contractor agrees in no way should the coverages and limits in the table be relied upon when assessing the extent or determining appropriate types and limits of coverage to protect the

Contractor against any loss exposures, whether as a result of the construction project or otherwise.

CERTIFICATE OF INSURANCE

Certificates of Insurance must provide clear evidence that Contractor's Insurance Policies contain the minimum limits of coverage and terms and conditions set forth herein. A minimum thirty (30) day endeavor to notify due to cancellation or non-renewal of coverage (except for non-payment of premiums which shall require ten (10) days' notice) shall be given by the Contractor.

In the event the County is notified that a required insurance coverage will cancel or will be non-renewed during the period of this Contract, the Contractor agrees to furnish at least thirty (30) days notice (except for non-payment of premiums which shall require ten (10) days' notice) prior to the expiration of such insurance, an additional certificate of insurance as proof that equal and like coverage for the balance of the period of the Contract and any extension thereof is in effect. Contractor agrees not continue to work pursuant to this Contract unless all required insurance remains in effect. The County shall have the right, but not the obligation, of prohibiting Contractor or any subcontractor from entering the project site until such certificates or other evidence that insurance has been placed in complete compliance with these requirements is received. The County reserves the right to withhold payment, but not the obligation, to Contractor until coverage is reinstated. If the Contractor fails to maintain the insurance as set forth herein, the County shall have the right, but not the obligation, to purchase said insurance at Contractor's expense.

ADDITIONAL REQUIREMENTS FOR CERTIFICATES OF INSURANCE

1. Shall clearly identify Palm Beach County, a political subdivision of the State of Florida, its officers and employees as Additional Insured for all required insurance coverages, except Workers Compensation and Business Auto Liability.
2. Shall clearly indicate project name and project number to which it applies.
3. Evidence of renewal coverage must be provided at least five (5) days in advance of any policy that may expire during the term of this Contract.
4. Shall clearly identify Palm Beach County included as a Loss Payee on the Installation Floater coverages.
5. Contractor shall deliver original Certificate(s) of Insurance to the following Certificate Holder address:

Palm Beach County
c/o Capital Improvements Division
2633 Vista Parkway
West Palm Beach, FL 33411-5604

6. Renewal Policies - The Contractor shall promptly deliver to the County a certificate of insurance with respect to each renewal policy, as necessary to demonstrate the maintenance of the required insurance coverage for the terms specified herein. Such certificate shall be delivered to the County not less than five (5) business days before to the expiration date of any policy.

DEDUCTIBLES, CO-INSURANCE, PENALTIES & SELF-INSURED RETENTION: The Contractor agrees to be fully and solely responsible for any costs or expenses as a result of a coverage deductible, co-insurance penalty, or self-insured retention; including any loss not covered because of the operation of such deductible, coinsurance penalty, or self-insured retention.

SUBCONTRACTOR'S INSURANCE: The Contractor agrees to cause each subcontractor employed by Contractor to purchase and maintain insurance of the type specified herein, unless the Contractor's insurance provides coverage on behalf of the subcontractor. When requested by the County, the Contractor agrees to obtain and furnish copies of certificates of insurance evidencing coverage for each subcontractor.

INSURANCE COVERAGE & TABLE :

The Contractor agrees to maintain the coverages, endorsements, and limits of liability in accordance with and set forth by the Insurance Coverage& Table below:

INSURANCE COVERAGE & LIMIT TABLE		
TYPE OF COVERAGE	Required Limits	
<u>COMMERCIAL GENERAL LIABILITY:</u> Limit of Liability not less than:	\$2,000,000 per occurrence	\$3,000,000 aggregate

INSURANCE COVERAGE & LIMIT TABLE		
<u>COMPREHENSIVE AUTO LIABILITY:</u> Limit of Liability not less than:	\$1,000,000 combined single limit	N/A

<u>WORKERS COMPENSATION & EMPLOYER'S LIABILITY:</u> Coverage not less than:	Statutory
<u>INSTALLATION FLOATER COVERAGE:</u> Limit not less than: Loss Payee endorsements required:	Highest value exposed during the project.

GC-32 SITE CONDITIONS

Contractor shall have the sole responsibility of satisfying itself concerning the nature and location of work and the general and local conditions, and particularly, but without limitation, with respect to the following: those affecting transportation, access, disposal, handling and storage of materials; availability, quantity and quality of labor, water and electric power; availability and condition of roads; climatic conditions, location of underground utilities as depicted on contract documents, and through verification with local utility companies and the County, physical conditions of existing construction, topography and ground surface conditions; subsurface geology, and nature and quantity of surface and subsurface materials to be encountered; the nature of the ground water conditions; equipment and facilities needed preliminary to and during performance of the Contract; and all other matters which can in any way affect performance of the Contract, or the cost associated with such performance. The failure of Contractor to acquaint itself with any applicable condition will not relieve it from the responsibility for properly estimating either the difficulties or the costs of successfully and timely performing the Contract.

Motorola represents that it has visited each existing site and acknowledges these sites are being provided in "as-is" condition.

GC-33 DIFFERING SITE CONDITIONS

Contractor shall notify County, within 48 hours of discovery, in writing and before proceeding with any work which Contractor believes constitutes a differing site condition with respect to: (1) subsurface or latent physical conditions at the jobsite differing materially from those indicated in this contract; or (2) unknown physical conditions at the jobsite, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this contract.

County will, as promptly as practicable, investigate such conditions and if it and Contractor determine that such conditions do materially so differ and cause an increase or decrease in

Contractor's cost of or the time required for performance of any part of any work under this contract, an equitable adjustment will be made and the contract modified in writing accordingly. No claim of Contractor under this clause will be allowed unless Contractor has given the required notice.

GC-34 NOT USED – ACCESS TO WORK AREAS, REPLACED BY RFP EXHIBIT B, SECTION 1.12

GC-35 NOT USED – CONTRACTOR INGRESS AND EGRESS, REPLACED BY RFP EXHIBIT B, SECTION 1.12

GC-36 NOT USED – PRECONSTRUCTION CONFERENCE, REPLACED BY RFP EXHIBIT B, SECTION 1.9

GC-37 NOT USED – CONTRACTOR MEETINGS, REPLACED BY RFP EXHIBIT B, SECTION 1.10

GC-38 NOT USED

GC-39 NOT USED – DELIVERY, UNLOADING AND STORAGE, REPLACED BY RFP EXHIBIT B, SECTION 1.7.5 & 9.3

GC-40 CONTRACTOR'S WORK AREA

All Contractors' work areas on the jobsite will be assigned by County. Contractor shall confine its office, shops, storage, assembly and equipment and vehicle parking to the areas so assigned. Before commencing work, the Contractor shall have a telephone where a representative of the Contractor may be reached at all times. Should Contractor find it necessary or advantageous to use any additional land outside the Project site for any purpose whatever, Contractor shall, at its expense, provide and make its own arrangements for the use of such additional land.

GC-41 CONTRACTOR'S PLANT, EQUIPMENT AND FACILITIES

Contractor shall provide and use on any work only such construction plant and equipment as are capable of producing the quality and quantity of work and materials required by the Contract and within the time or times specified in the Contract. Before proceeding with any Contract work or with erection of any facilities, including but not limited to temporary structures, machinery, equipment, offices and warehouses, Contractor shall furnish County such information and drawings relative to such equipment, plant facilities as County may request.

Upon written order of County, Contractor shall discontinue operation of nonconforming plant and equipment or facilities and shall either modify or remove the items which are nonconforming to this Contract from the site. Contractor shall not remove construction plant or equipment from the site before the work is finally accepted without County's written approval. Such approval shall not be unreasonably withheld.

GC-42 NOT USED – CONTRACTOR- FURNISHED MATERIALS, EQUIPMENT AND WORKMANSHIP, REPLACED BY RFP EXHIBIT B, SECTION 1.11

GC-43 SUBSTITUTIONS

Prior to proposing any substitute item, Contractor shall satisfy itself that the item proposed is, in fact, equal or better to that specified, that such item will fit into the space allocated, that such item affords comparable ease of operation, maintenance and service, that the appearance, longevity and suitability for the climate are comparable, and that by reason of cost savings, reduced construction time, or similar demonstrable benefit, the substitution of such item will be in County's interest, and will in no way impact detrimentally upon the project completion date and schedule.

The burden of proof of equality of a proposed substitution for a specified item shall be upon Contractor. Contractor shall support its request with sufficient test data or other means to permit County to make a fair and equitable decision on the merits of the proposal. Contractor shall submit drawings, samples, data and certificates and additional information as may be reasonably required by the County for proposed substitute items as required by the County for proposed substitute items as required by GC-46 CONTRACTOR FURNISHED DRAWINGS, DATA & SAMPLES.

Any item by a manufacturer other than those specified or of brand name or model number or of generic species other than those specified will be considered a substitution. County will be the sole judge of whether or not the substitution is equal in quality, utility and economy to that specified. Contractor shall allow an additional fifteen (15) days for County's review of substitution. All requests for substitutions with submittal data must be made at least fifty (50) days prior to the time Contractor must order, purchase or release for manufacture or fabrication. Materials and methods proposed as substitutions for specified items shall be supported by certification of their approval for use by all governmental agencies having jurisdiction over use of specific material or method. Substitutions may not be permitted in those instances where the products are designed to match artistic design, specific function or economy of maintenance. Approval of a substitution shall not relieve Contractor from responsibility for compliance with all requirements of the Contract. Contractor shall coordinate the change with all trades and bear the expense for any changes in other parts of the work caused by any substitutions.

If County rejects Contractor's substitute item on the first submittal, Contractor may make only one additional request for substitution in the same category. On the second request, and all future requests, the Contractor shall be invoiced the expenses (including County, and Design Professionals cost and overhead) involved in reviewing submittal data.

GC-44 EXPEDITING

The equipment and material furnished under this Contract may be subject to reasonable expediting by County. County shall be allowed reasonable access to the shops, factories, and other places of business of the Contractor and its subcontractors and suppliers, for expediting purposes. As required by County, Contractor shall supply schedules and progress reports for County's use in expediting and Contractor shall cooperate with County and require

its subcontractors and suppliers to cooperate with County in such expediting. Any expediting performed by County shall not relieve Contractor of its sole and primary responsibility for timeliness of delivery of the equipment and material to be furnished under this Contract.

GC-45 NOT USED – FIELD LAYOUT OF WORK, REPLACED BY RFP EXHIBIT B, SECTION 9.2

GC-46 CONTRACTOR FURNISHED DRAWINGS, DATA AND SAMPLES

Review and permission to proceed by County as stated in this Contract does not constitute acceptance or approval of design details, calculations, analyses, test methods, certificates or materials developed or selected by the Contractor and does not relieve Contractor from full compliance with contractual obligations. Drawings, samples, catalogues, data and certificates required to be submitted to the County for review, shall be submitted attached to forms provided by County.

Transmittals from the Contractor to the County shall be numbered sequentially and the submittal number shall be referenced. Submittal drawings (shop, erection or setting diagrams) and schedules, required for work of various trades, shall be checked before submission by technically qualified employees of Contractor for accuracy, completeness and compliance with contract requirements. These drawings and schedules shall be stamped and signed by Contractor certifying to such check. The certification stamp shall read as follows:

"I certify that I have checked this submittal for accuracy, completeness and compliance with contract requirements, and it has been coordinated with all other submittals and Contract Documents."

_____	_____
SIGN	DATE

"XYZ Company"

A. Drawings

Where drawings are required for (a) fabrication of Contractor furnished equipment; (b) installing Contractor furnished material or equipment; or (c) planning and performance of the work under Contract; such drawings shall be originally generated and submitted by and at the expense of the Contractor before fabrication, installation or performance is commenced. Each submittal shall be made not less than thirty-five (35) calendar days prior to the time that the drawings are required in accordance with the schedule. Allow at least 21 calendar days for review by County. Such drawings shall include, but not be limited to, match marks, erection diagrams and other details, such as field connections for proper installation, erection of the equipment, and performance of the work.

For drawings greater in size than 11" x 17", one reproducible and four copies shall be submitted to the County by and at the expense of the Contractor. The County will be the sole judge of the adequacy of the quality of the reproducible and prints and may reasonably reject

reproducibles and/or prints on the basis of quality alone. Such drawings will not be folded, but will be transmitted in mailer rolls manufactured expressly for that purpose. The reproducible with the County's review comments will be returned to the Contractor. A reproducible copy of drawings equal to or less than 11" x 17" is not necessary, but five copies of the unfolded drawings must be transmitted to the County.

If drawings show variations from the contract requirements, the Contractor shall describe such variations in writing, separate from the drawings, at the time of submission. If the County approves any such variation(s), it will issue an appropriate contract modification, except that, if the variation is minor and does not involve a change in price or in time of performance, a modification need not be issued.

Drawings of a specific piece of equipment shall identify components with the manufacturer's part number or reference drawing clearly indicated. If reference drawing numbers are used, the review date of such drawings shall be included. Drawings shall indicate design dimensions, maximum and minimum allowable operating tolerances on all major wear fits, i.e. - rotating, reciprocating or intermittent sliding fits between shafts or stems and seals, guides and pivot pins. The sequence of submission of all drawings shall be such that all information is available for reviewing each drawing when it is received.

All drawings submitted by the Contractor shall be certified and dated by the Contractor on the face of each drawing to be correct, accurate and shall be furnished in accordance with requirements of the specifications. County will conduct a review of Contractor's drawings and a drawing marked with one of the following review comments will be returned to the Contractor.

1. No exceptions taken.
2. Make corrections noted. No re-submittal.
3. Make corrections noted. Resubmit.
4. Rejected.
5. Not required for review.

The Contractor must incorporate the changes indicated, resubmit and obtain a Code 1 or 2 notation before release for shipment can be granted.

B. Samples

Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the work will be judged. Samples of all items of related systems (i.e. adjacent surfaces requiring similar colors but manufactured of different materials) must be submitted in the same time frame before the approval process can begin.

Where samples are required, they shall be submitted by and at the expense of the Contractor. Such submittal shall be made not less than thirty five (35) calendar days prior to the time that the materials represented by such samples need to be ordered for incorporation into

any work in accordance with the schedule. Allow at least 21 calendar days for County's review. Materials represented by such samples shall not be manufactured, delivered to the site or incorporated into any work without such review. Each sample shall bear a label showing the Contractor's name, date submitted, project name, name of the item, manufacturer's name, brand name, model number, supplier's name, and reference to the appropriate drawing, technical specification section and paragraph number, all as applicable.

Samples which have been reviewed may, at County's option, be returned to the Contractor for incorporation into the work.

C. Catalogues, Data and Certificates

Where catalogues, data or certificates are required, five (5) copies of each shall be submitted by and at the expense of the Contractor. Such submittal shall be made not less than thirty five (35) calendar days prior to the time that the materials represented by such catalogues, data or certificates must be ordered for incorporation into any work in accordance with the CPM schedule. Allow at least 21 calendar days for County's review. Material represented by such shall not be fabricated, delivered to the site or incorporated into any work without such review.

Certificates shall clearly identify the material being certified and shall include but not be limited to providing the following information: Contractor's name, project name, name of the item, manufacturer's name, and reference to the appropriate drawing, technical specification section and paragraph number all as applicable. All catalogues, data and certificates submitted by the Contractor shall be certified and dated by the Contractor on the face of each catalogue, data and certificate to be correct and shall be furnished in accordance with these requirements and the requirements of the Technical Specification, on forms provided by the County. County will conduct a review of Contractor's catalogues, data, and certificates and one copy marked with the review comments listed in paragraph A, above, will be returned to the Contractor.

GC-47 CONSTRUCTION SCHEDULE

The Project shall be monitored by a detailed Critical Path Method scheduling system. This system shall be the basis for the evaluation of all Contractor's performance. The Contractor shall, at least seven (7) calendar days prior to the pre-construction conference, submit to County for acceptance a short-term Schedule in the form of a 3-month bar chart indicating the initial activities of the Project including submittals. This short-term Schedule must be accepted by the County prior to application for the first progress payment. The Contractor, shall within (30) calendar days from and after the Contractor's receipt of written notice to proceed, and before the first progress payment is approved for payment by the County, submit to County for acceptance a detailed fabrication and construction schedule based on a critical path analysis of construction activities and sequential operations needed for the orderly performance and completion of any separable parts of any and all work in accordance with the Contract. The total project duration of the CPM schedule shall be based upon an assumed award date of 11/17/2015 and Final System Acceptance date of no later than 6/1/2017.

The CPM schedule and all reports shall be prepared with computer software by Microsoft Project.

The construction schedule shall be complete in all respects, covering, in addition to activities

and interfaces with other Contractors at the site of work, offsite activities such as design, fabrication, an allowance for weather delays, submittals, procurement and jobsite delivery of Contractor furnished material and equipment. The schedule shall be a Critical Path Method (CPM) type network drawn to a time scale using arrow or precedence type diagramming. The construction schedule activities shall mirror the payment application breakdown.

The construction schedule shall include the following:

1. Brief description of each activity.
2. All submittals, samples, approvals, fabrication, and deliveries for equipment and materials. Allow no more than sixty (60) days float between submittal approval and beginning of fabrication.
3. Activities showing scheduled start and finish, late start and finish, and float.
4. Relations between activities.
5. Duration of activities. No activity shall be scheduled for more than 20 workdays.
6. Contractual and other major milestones including phasing.
7. Schedule activities to include labor and material.
8. An allowance for delays due to weather. Contract time extensions for weather delays will be granted only when all of the conditions and criteria for evaluation of time extensions have been met pursuant to the General Conditions.
9. County activities or activities by others which will affect the Contractor's work.

Upon acceptance of the original CPM Schedule, the Early Start and Early Finish dates for all activities shall be fixed as Planned Start and Planned Finish dates. Any further revisions to the schedule must be submitted in writing and approved by the County.

The detailed CPM schedule submittal shall include five (5) color copies of the following:

1. Time Scaled Network Diagram.
2. Bar Chart in the following formats:
 - a. Sorted by activity.
 - b. Sorted by total float
 - c. Sorted by early start
 - d. Precedence and Successor report.

- e. Narrative report.
 - f. Electronic copy (One copy).
3. Submittals shall be organized under Standard CSI format.

The detailed CPM Schedule shall be updated monthly and submitted along with an updated computer diskette with the Application for Payment. Contractor shall meet with the County and County's Radio Consultant to review and verify:

- 1. Actual start and finish dates for completed activities.
- 2. Remaining duration required to complete each activity started, scheduled to start, but not completed.
- 3. Logic and time, for change orders that are to be incorporated into the diagram and computer produced schedules.
- 4. Percentage for completed and partially completed activities.

The Contractor shall submit a written narrative report as a part of his monthly review and update in a form agreed upon by the Contractor and the County. The narrative report shall include a description of problem areas; current and anticipated delaying factors and their estimated impact on performance of other activities and completion dates; and an explanation of corrective action taken or proposed.

The Contractor shall have in its employ for the length of this project, at least one qualified scheduling specialist whose responsibility as to this Contract will be to prepare, plan and draft the construction schedules, monitor the construction progress, analyze scheduling problems for resolution, update the Construction Schedule as required in the Contract, and maintain updated information as required regarding the interface with other contracts.

The Contractor agrees that whenever it becomes apparent from the current progress review meeting or the computer produced calendar dated schedule that the contract completion date will not be met, the Contractor shall execute some or all of the following remedial actions at Contractor's sole cost and expense:

- 1. Increase construction manpower in such quantities and crafts as necessary to eliminate the backlog of work.
- 2. Increase the number of working hours per shift, shifts per working day, working days per week, the amount of construction equipment, or any combination of the foregoing to eliminate the backlog of work.
- 3. Reschedule the work in conformance with the specification requirements.

Prior to proceeding with any of the above actions, the Contractor shall notify the County of

the proposed schedule changes. Such actions shall be incorporated by the Contractor into the diagram before the next update, at no additional cost.

GC-48 RESPONSIBILITY FOR WORK SECURITY

Contractor shall, at its expense, at all times conduct all operations under the Contract in a manner to avoid the risk of loss, theft or damage by vandalism, sabotage or other means to any property. Contractor shall promptly take all reasonable precautions which are necessary and adequate against any conditions which involve a risk of loss, theft or damage to its property, at a minimum. Contractor shall continuously inspect all its work, materials, equipment and facilities to discover and determine any such conditions and shall be solely responsible for discovery, determination and correction of any such condition.

Contractor shall prepare and maintain accurate reports of incidents of loss, theft or vandalism and shall furnish these reports to County within three days of each incident.

GC-49 PROTECTION OF WORK IN PROGRESS, MATERIALS AND EQUIPMENT

Contractor shall be responsible for and shall bear any and all risk of loss or damage to work in progress, all materials delivered to the site, and all materials and equipment involved in the work until system cut-over of work under this Contract. Excluded from Contractor's responsibility is any loss or damage which results from the sole active negligence of the County or its representatives.

Permanent openings or thoroughfares for the introduction of work and materials to the structure and construction site shall be protected so that upon completion, the entire work will be delivered to the County in proper, whole and unblemished condition.

GC-50 PROTECTION OF EXISTING PROPERTY

Contractor shall conduct its operation so as not to damage any existing buildings or structures. The Contractor shall verify that means and methods of construction used inside, adjacent to, under or over existing buildings will not cause damage. The Contractor shall provide protection methods which are acceptable to the County and/or its Insurance Representatives.

Unless otherwise specifically provided in the Contract, Contractor shall not do any work that would disrupt or otherwise interfere with the operation of any pipeline, telephone, electric, radio, gas, transmission line, ditch or other structure, nor enter upon lands in their natural state until approved by County. Thereafter, and before it begins such work, Contractor shall give due notice to County of its intention to start such work. Contractor shall not be entitled to any extension of time or any extra compensation on account of any postponement, interference or delay caused by any such line, ditch or structure on or adjacent to the site of work.

Contractor shall preserve and protect all cultivated and planted areas and vegetation such as trees, plants, shrubs and grass on or adjacent to the premises, which, as determined by County, do not reasonably interfere with the performance of this Contract.

Contractor shall be responsible for damage to any such areas and vegetation and for unauthorized cutting of trees and vegetation, including, without limitation, damage arising from the performance of its work through operation of equipment or stockpiling of materials. All reasonable cost in connection with any repairs or restoration necessary or required by reason of any such damage or unauthorized cutting shall be borne by Contractor.

GC-51 LABOR

Contractor shall employ only competent and skilled personnel to perform the work. Contractor shall, if requested to do so by County, remove from the jobsite any personnel of Contractor whom County determines unfit or acting or working in violation of any provision of this contract.

Contractor shall assign staff as listed in the RFP response as referenced herein. The project manager for the Contractor shall be continually involved with the project unless agreed to the contrary by County, or their employment with the Contractor is terminated and any such replacement shall have equivalent experience and credentials.

Work assignments and the settlement of jurisdictional disputes shall conform with either the Rules, Regulations and Procedures of the Plan for Settlement of Jurisdictional Disputes in the Construction Industry, and any successor agreement thereto, or any other mutually established method of determining work assignments and settling jurisdictional disputes.

Contractor shall comply with and shall cooperate with County in enforcing jobsite conditions and job work rules which directly affect the performance of the work including but not limited to starting and quitting time, smoking regulations, check-in and check-out procedures, job site safety regulations and security regulations, emergency plans and procedures, and daily clean-up.

The Contractor and subcontractors shall be bound by and comply with all Federal, State and local laws with regard to minimum wages, overtime work, hiring, and discrimination. All work necessary to be performed after regular working hours, on Sundays or legal holidays, shall be performed without additional expense to the County. The Contractor shall comply with the Copeland Anti-Kick Back Act (19 U.S.C. 874) as supplemented in the Department of Labor Regulations (29 CFR Part 3). This act provides that each Contractor or Subcontractor shall be prohibited from inducing by any means, any person employed in the construction, completion or repair of public work, to give up any part of the compensation to which he is otherwise entitled.

Contractor shall submit "Contractor's Daily Report" for each day work is accomplished. Reports shall be submitted daily to County.

GC-52 EQUAL EMPLOYMENT OPPORTUNITY

During the performance of this Contract, the Contractor agrees as follows:

- a. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, disability, sex, age, national origin, ancestry, marital status, sexual orientation, gender identity or expression, familial status, or genetic information. The Contractor will take affirmative action to ensure that applicants and employees are treated during employment without regard to their race, color,

religion, disability, sex, age, national origin, ancestry, marital status, sexual orientation, gender identity or expression, familial status, or genetic information. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the County setting forth provisions of this nondiscrimination clause.

- b. The Contractor will, in all solicitations or advertisements for employees placed for, by, or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, disability, sex, age, national origin, ancestry, marital status, sexual orientation, gender identity or expression, familial status, or genetic information.
- c. The Contractor will send to each labor union or representatives of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided by the County, advising the labor union or workers' representative of the Contractor's commitments under Section 202 of Executive Order 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- d. The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- e. The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the County and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- f. In the event of the Contractor's noncompliance with the nondiscrimination clauses of this Contract or with any of such rules, regulations, or orders, this Contract may be cancelled, terminated or suspended in whole or in part and the Contractor may be declared ineligible for further contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
 - A. The Contractor will include the provisions of paragraphs A through F in every subcontract or purchase unless exempted by rules, regulations, or orders

of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontractor or purchase order as may be directed to the Secretary of Labor as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the Contractor may request the United States to enter into such litigation to protect the interest of the United States.

- B. All regulations, guidelines, and standards lawfully adopted under the governing statutes.

GC-53 SAFETY & PROTECTION OF PERSONS & PROPERTY RESPONSIBILITY FOR SAFETY AND HEALTH

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the work to be performed under the terms of the Contract ("Work"). The Contractor shall take all precautions and follow all procedures for the safety of, and shall provide all protection to prevent injury to, all persons involved in any way in the Work and all other persons, including, without limitation, the employees, agents, guests, visitors, invitees and licensees of the County and Users who may be affected thereby. The Contractor shall set forth in writing its safety precautions and programs in connection with the Work and submit the same to the County. The County may, but shall not be obligated to, make suggestions and recommendations to the Contractor with respect thereto.

All Work, whether performed by the Contractor, its Sub-Contractors or Sub-subcontractors, or anyone directly or indirectly employed by any of them, and all equipment, appliance, machinery, materials, tools and like items incorporated or used in the Work, shall be in compliance with, and conform to:

- A. all applicable laws, ordinances, rules, regulations and orders of any public, quasi-public or other authority relating to the safety of persons and their protection against injury, specifically including, but in no event limited to, the Federal Occupational Safety and Health Act of 1970, as amended and all State, Local, City and County rules and regulations now or hereafter in effect; and
- B. all codes, rules, regulations and requirements of the County and its insurance carriers relating thereto. In the event of conflicting requirements, the more stringent shall govern.

Should the Contractor fail to provide a safe area for the performance of the Work or any portion thereof, the County shall have the right, but not the obligation, to suspend Work in the unsafe

area. All costs of any nature resulting from the suspension, by whomsoever incurred, shall be borne by the Contractor.

The Contractor shall provide, or cause to be provided, to each worker on the Job Site the proper safety equipment for the duties being performed by that worker and will not permit any worker on the Job Site who fails or refuses to use the same. The County shall have the right, but not the obligation, to order the Contractor to send a worker home for the day or to discharge a worker for his or her failure to comply with safe practices, with which order the Contractor shall promptly comply.

The Contractor shall not raise as a defense to its obligation to indemnify under this General Condition any contributing negligence of any of those indemnified hereunder, it being understood and agreed that no such contributing negligence shall relieve the Contractor from its liability to so indemnify nor entitle the Contractor to any contribution, either directly or indirectly, by those indemnified hereunder.

In any and all claims against those indemnified hereunder by any employee of the Contractor, any Subcontractor or Sub-subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this Paragraph shall not be limited in any way to any limit(s) on the amount or type of damage, compensation or benefits payable by or for the Contractor or any Subcontractor or Sub-subcontractor under any workers' compensation acts, disability benefit acts or other employee benefit acts.

PROTECTION OF WORK AND PROPERTY; RESPONSIBILITY FOR LOSS

The Contractor shall, throughout the performance of the Contract, maintain adequate and continuous protection of all completed Work and temporary facilities against loss or damage from whatever cause, shall protect the property of the County and third parties from loss or damage from whatever cause arising out of the performance of the Contract and shall comply with the requirements of the County and its insurance carriers and with all applicable laws, codes, rules and regulations with respect to the prevention of loss or damage to the property. The County, their representatives or insurance carriers may, but shall not be required to, make periodic patrols of the Job Site as a part of its normal safety, loss control and security programs. In such event, however, the Contractor shall not be relieved of its aforesaid responsibilities and the County shall not assume, nor shall it be deemed to have assumed, any responsibility otherwise imposed upon the Contractor by this Contract.

Until final acceptance of the Work by the County the Contractor shall have full and complete charge and care of and, except as otherwise provided in this subparagraph, shall bear all risk of loss of, and injury or damage to, the Work or any portion thereof (specifically including County furnished supplies, equipment or other items to be utilized in connection with, or incorporated in, the Work) from any cause whatsoever.

The Contractor shall rebuild, repair, restore and make good all losses of, and injuries or damages to, the Work or any portion thereof (specifically including County furnished supplies, equipment or other items to be utilized in connection with, or incorporated in, the Work) before final

acceptance of the Work. Such rebuilding, repair or restoration shall be at the Contractor's sole cost and expense unless the loss, injury or damage requiring such rebuilding, repair or restoration:

- a. is directly due to errors in the Contract Documents which were not discovered by the Contractor and which the Contractor could not have discovered through the exercise of due diligence;
- b. is caused by the agents or employees of the County (unless (1) the Contractor has waived its rights of subrogation against the County on account thereof as provided in the Contract Documents, or (2) such loss or damage would be covered by any policy or policies of insurance which the Contractor is required to maintain hereunder, whether the Contractor actually maintains such insurance or not, or (3) is otherwise covered by a policy or policies of insurance maintained by the Contractor, whether or not required hereunder).

SURFACE AND SUBSURFACE WATER

Surface or subsurface water or other fluid shall not be permitted to accumulate in excavations or under or in the structures. Should such conditions develop or be encountered, the water or other fluid shall be controlled and suitably disposed of by means of temporary pumps, piping, drainage lines and ditches, dams or other methods approved by the County in writing. The proposed location and coordination of temporary channels and conduits conducting accumulated water from the Job Site shall be permitted by the proper regulatory agency and submitted to the County for its prior written approval. All such work shall be done at the sole expense of the Contractor.

EMERGENCIES

In any emergency affecting the safety of persons or property, or in the event of a claimed violation of any federal or state safety or health law or regulation, arising out of or in any way connected with the Work or its performance, the Contractor shall act immediately to prevent threatened damage, injury or loss to remedy said violation, whichever is applicable. Failure by Contractor to take necessary emergency action shall entitle the County to take whatever action it deems necessary including, but not limited to, suspending the Work as provided in GC-23.

The County may offset any and all costs or expenses of whatever nature, including attorneys' fees, paid or incurred by the County in taking such emergency action against any sums then or thereafter due to the Contractor. The Contractor shall defend, indemnify and hold the County harmless against any and all costs or expenses pursuant to this Paragraph, by whomsoever incurred for which Contractor is responsible. If the Contractor shall be entitled to any additional compensation or extension of time claimed on account of emergency work which is not due to the fault or neglect of the Contractor or its Subcontractors or Sub-subcontractors, it shall be handled as a claim as provided in GC-65.

COUNTY'S STANDARDS

The County reserves the right, but assumes no duty, to establish and enforce standards, and to change the same from time to time, for the protection of persons and property, with which the

Contractor shall comply, and to review the efficacy of all protective measures taken by the Contractor. The exercise of or failure to exercise any or all of these rights by the County shall not relieve the Contractor of its duties and responsibilities under this Contract, and the County shall not thereby assume, nor be deemed to have assumed, any such duties or responsibilities of the Contractor.

GC-54 NOT USED – PROJECT SITE PROTECTION, REPLACED BY RFP EXHIBIT B 1.7.2

GC-55 FIRE PREVENTION

Contractor shall, at its expense, conform to all Federal, State, and local laws and regulations pertaining to burning, fire prevention and control within or adjacent to the project. Necessary precautions to avoid and eliminate fire hazards shall be the responsibility of the Contractor. This includes keeping the Contract work area clear of all trash at all times.

All tarpaulins used for any purpose during construction of any work shall be made of material resistant to fire, water and weather and shall bear UL labels. Lighting of any fires on premises is strictly forbidden. Controlled burning shall be with the consent of the County. Contractor shall provide portable fire extinguishers properly labeled, located and compatible with the hazard of each work area and shall instruct its personnel in their use. Wherever welding and burning are conducted, inflammable materials shall be protected and a fire watch shall be provided by Contractor to be present during the burning and welding operation to ensure that protective measures are taken and that no fires result from such operation. The fire watch shall have fire extinguisher equipment readily available and know-how for proper use.

GC-56 ILLUMINATION

When any work is performed at night or where daylight is shut off or obscured, Contractor shall, at its expense, provide artificial light sufficient to permit work to be carried on efficiently, and safely, and to permit thorough inspection. During such time periods the access to the place of work shall also be clearly illuminated. All wiring for electric light and power shall be installed and maintained in a first-class manner, securely fastened in place at all points, and shall be kept as far as possible from telephone wires, signal wires, and wires used for firing blasts.

GC-57 BEST MANAGEMENT PRACTICES

Contractor shall be responsible for evaluating the site before construction is initiated to determine if any site conditions may pose particular problems for the handling of any Regulated Substances. For example, handling Regulated Substances in the proximity of water bodies or wetlands may be improper.

Regulated Substances are substances that may cause significant harm to human health and the environment (including surface and groundwater). The Unified Land Development Code (ULDA) Section 9.3, Wellfield Protection, regulates the storage, handling, use and production of Regulated Substances within wellfield zones which may impair present and future drinking water suppliers. In addition, the ULDC, Section 9.6, Excavation, requires that Best Management Practices for the Construction industries be followed for Agricultural Area, TYPE II, TYPE IIIA and TYPE IIIB excavation activities.

If any regulated substances are stored on the construction site, they shall be stored in a location and manner which will minimize any possible risk of release to the environment. Any storage container of 55 gallons, or 440 pounds, or more containing Regulated Substances shall have constructed below it an impervious containment system constructed of materials of sufficient thickness, density and composition that will prevent the discharge to the land, groundwaters, or surface waters, of any pollutant which may emanate from said storage container or containers. Each containment system shall be able to contain 150% of the contents of all storage containers above the containment system.

Contractor shall familiarize itself with the manufacturer's safety data sheet supplied with each material containing a Regulated Substance and shall be familiar with procedures required to contain and clean up any releases of the Regulated Substance. Any tools or equipment necessary to accomplish same shall be available in case of a release.

Upon completion of construction, all unused and waste Regulated Substances and containment systems shall be removed from the construction site and shall be disposed of in a proper manner as prescribed by law.

GC-58 DUST CONTROL

The Contractor, for the duration of the Contract, shall, at its expense, maintain all excavations embankments, haul roads, access roads, plant sites, waste disposal areas, borrow areas, and all other work areas free from dust. Industry-accepted methods of dust control suitable for the area involved and approved by County will be permitted.

GC-59 WATER POLLUTION

Contractor shall, at its expense, provide suitable facilities to prevent the introduction of any substance or materials into any stream, river, lake or other body of water which may pollute the water or constitute substances or materials deleterious to fish and wildlife.

GC-60 AIR POLLUTION

The Contractor shall, at its expense, so perform its work as not to discharge into the atmosphere from any source whatever smoke, dust, or other air contaminants in violation of the laws, rules and regulations of all Federal, State and local air and water pollution requirements including, but not limited to: Registering with the Palm Beach County Health Department, Air Pollution Board, any equipment requiring operating permits by said Board; Adhering to all Palm Beach County Air Pollution Board Regulations.

GC-61 EXPLOSIVES & HAZARDOUS MATERIALS

Contractor shall obtain all required Federal, State and local permits and licenses and shall be responsible for the safe and proper handling, transporting, storage and use of any explosive or hazardous materials brought onto or encountered within the site, and at its expense, make good any damage caused by its handling, transporting, storage and use. The Contractor will notify the County immediately if explosive or hazardous materials are encountered on the site. Transporting explosive or hazardous materials onto the site will require prior written approval

from the County. The Contractor shall maintain and Post as necessary Material Hazard Data Sheets for all applicable Hazardous Materials used in the course of his work.

In the event that hazardous material is improperly handled or stored by the Contractor, its subcontractors, any sub-sub contractors, or any employee or agent of any of the aforementioned which results in contamination of the site, Contractor shall immediately notify the County and the appropriate governmental authority and shall take whatever action is necessary or desirable to remediate the contamination at the Contractor's sole cost and expense. Further, Contractor shall indemnify and hold harmless from any and all cost, expense, action, or liability whatsoever resulting from such contamination and/or remedial activities.

GC-61(a) ASBESTOS NOTIFICATION

Prior to the renovation of any structure, the County conducts an inspection for asbestos-containing building materials (ACBM), through a review of current surveys or the request for a new survey. All asbestos surveys are conducted under the direction of Florida Licensed Asbestos Consultants contracted by the County.

Prior to the renovation of any structure, the County facilitates the removal of all ACBM that may be distributed during the renovations, (except bituminous roofing materials), unless stated otherwise in the contract documents. All asbestos removal is conducted by a Florida Licensed Asbestos Contractor contracted by the County.

An asbestos summary report may be included as part of the contract documents. If not attached, it is the Contractor's responsibility to contact the County and request the report.

Licensed Asbestos Contractors are not required for removing or repairing asbestos containing roofs, except for transite (cementitious) shingles. If the work specified will disturb asbestos containing roofing materials, you must comply with all requirements of OSHA 1926.58 and ASBESTOS NESHAPS. A summary of these requirements are outlined by the National Roofing Contractors Association (NRCA). A licensed roofer who has training as an asbestos competent person is required for projects disturbing asbestos roof materials. The County will provide an asbestos survey of the roof.

If materials are discovered that are suspect asbestos materials that were not previously sampled, stop all work that will disturb these materials and immediately notify the County.

GC-62 INSPECTION: REJECTION OF MATERIALS AND WORKMANSHIP

All materials and equipment furnished and work performed shall be properly inspected by Contractor, at its expense, and shall at all times be subject to quality surveillance, observations or quality audit by County. Contractor shall provide safe and adequate facilities and all samples, drawings, lists and documents necessary for such quality surveillance, observation or quality audit. For this purpose County shall be afforded full and free access to the shops, factories or places of business of Contractor and its subcontractors and suppliers for such quality surveillance, observation or quality audit and to determine the status of the work. If Contractor covers all or any portion of the work prior to any quality surveillance or test by County, the cost of any necessary uncovering and replacing shall be borne by Contractor. Neither the failure to

make such quality surveillance, observance or quality audit, nor to discover defective workmanship, materials, or equipment, nor acceptance of or payment to Contractor for such work, materials or equipment shall prejudice the rights of County thereafter to correct or reject the same as hereinafter provided.

If any material, equipment or workmanship is determined by County, either during performance of the work or on final quality surveillance, or during any applicable warranty period (expressed or implied), to be defective or not complying with the requirements of this contract, County shall notify Contractor in writing that such material, equipment or work is rejected and the County reserves the right to withhold payment on any such item. Thereupon, Contractor shall, at its own expense, immediately remove and replace or correct such defective material, equipment or work by making the same comply strictly with all requirements of the Contract.

GC-63 NOT USED – TESTING, REPLACED BY RFP EXHIBIT B, SECTION 10

GC-64 PROGRESS

Contractor shall give County full information in advance as to its plans for performing each part of the work. If at any time during the progress of work, Contractor's actual progress is inadequate to meet the requirements of the Contract, County may so notify Contractor who shall thereupon take such steps as may be necessary to improve its progress. If within a reasonable period as determined by County, Contractor does not improve performance to meet the currently approved contract construction schedule, County may require an increase in Contractor's labor force, the number of shifts, overtime operations, additional days of work per week and an increase in the amount of construction plant; all without additional cost to County. Neither such notice by County nor County's failure to issue such notice shall relieve Contractor of its obligation to achieve the quality of work and rate of progress required by the Contract.

Failure of Contractor to comply with the instructions of County may be grounds for determination by County that Contractor is not prosecuting its work with such diligence as will assure completion within times specified. Upon such determination, County may terminate Contractor's right to proceed with the performance of the Contract, or any separable part thereof, in accordance with the applicable provisions of this Contract.

GC-65 CHANGES

County may, at any time, without invalidating the Contract and without notice to the Surety (ies), make changes in the work by issuing a written and mutually agreed Change Order.

County may issue written orders to Contractor for any changes in the event of an emergency which County determines endangers life or property. Such orders will be confirmed in writing as soon as practicable. Such orders, whether written or oral, may be accompanied by drawings and data as are necessary to show the extent of such ordered work.

Contractor shall commence such changed work so that all dates set forth in Contractor's current construction schedule as accepted by County will be met. In the event of an emergency which County determines endangers life or property, Contractor shall immediately commence such changes as required by County in order to mitigate or remove the emergency condition. Failure to

commence any such change in timely fashion shall entitle County to invoke the provisions of the GENERAL CONDITIONS entitled TERMINATION FOR DEFAULT.

Unless otherwise required, Contractor shall, within twenty-one (21) calendar days following receipt of a written contract Field Bulletin, submit in writing to County a Contract Change Proposal for accomplishing such change, which proposal shall reflect the increase or decrease, if any, in cost to County of performing the change under the Contract in comparison to what the cost would have been, had such change not been offered.

The proposal shall state the Contractor's added and/or deleted compensation in detail, including but not limited to:

1. Firm-fixed fee cost
2. Subcontractor costs
3. Time extension, if any
4. A detailed description of any impacts this change will have on any activities on the Critical Path which would affect any of the Milestone Dates;
5. Proof of payment of any tax liability resulting from a specific change (if requested by County).

Under no circumstances shall Contractor apply for or be entitled to recover extended home office overhead costs associated with a change in the work, whether or not calculated in accordance with the Eichleay Formula.

Any time extension request shall be submitted in accordance with GC-27. County may make changes to the work after a contractual Substantial Completion date and will state in the written change order if the completion of the work is required for a Substantial Completion. If the work is required to be completed before a Substantial Completion date, then the provisions of GC-27 apply. If the work may be completed after a Substantial Completion date, then the work will be considered as a separate phase of the contract with a separate time frame and completion date and will not affect a contractual Substantial Completion date.

GC-66 NOT USED – RECORD DRAWINGS AND SPECIFICATIONS, REPLACED BY RFP EXHIBIT B, SECTION 12

GC-67 NOT USED – MEASUREMENT AND PAYMENT FOR WORK, REPLACED BY RFP Exhibit B, SECTION 16 AS MODIFIED BY THE NEGOTIATED PAYMENT SCHEDULE APPENDIX D Schedule A

GC-68 NOT USED – PROGRESS PAYMENT PROCEDURES, REPLACED BY RFP EXHIBIT B, SECTION 16.2

GC-69 NOT USED - USE OF COMPLETED PORTIONS OF WORK

GC-70 NOT USED – ALLOWANCES AND UNIT PRICES, REPLACED BY RFP EXHIBIT B, SECTION 16

GC-71 NOT USED – SUBSTANTIAL COMPLETION, REPLACED BY RFP EXHIBIT B, SECTION 15.1

GC-72 NOT USED – FINAL INSPECTION AND ACCEPTANCE, REPLACED BY RFP EXHIBIT B, SECTION 15.2

GC-73 DISPOSAL OF MATERIAL OUTSIDE PROJECT LIMITS

The Contractor shall make its own arrangements for disposal of materials outside the project limits and he shall pay all costs involved. The County reserves the right to retain any salvage material or equipment scheduled for removal. Should the County elect to retain salvaged materials or equipment, the County will provide appropriate on-site storage and protection. The County will be responsible for transporting from the site any materials or equipment it has elected to retain. Off-site disposal of any items not retained by the County shall be the responsibility of the Contractor.

When any material is to be disposed of outside the project limits, the Contractor shall first obtain a written permit from the property County on whose property the disposal is to be made and he shall file in writing with the County said permit or the certified copy thereof together with a written release from the property County absolving the agency of any and all responsibility in connection with the disposal of material on said property.

When material is disposed of as above provided and the disposal location is visible from the project, the Contractor shall dispose of the material in a neat and uniform manner.

GC-74 IDENTITY OF INTEREST WITH SUBCONTRACTORS/SUPPLIERS

The Contractor represents to the County that to the best of its knowledge, neither the Contractor, nor any officer, director, partner or shareholder who holds ten percent (10%) or more of the outstanding stock of the Contractor, has any financial interest in, or as an officer, director, partner or ten percent (10%) plus shareholder of any firm, person or entity which has been or may be contracted with to furnish labor, material, equipment or professional services in connection with the construction or the Project. Contractor agrees to give written notification and obtain the approval of the County before entering into any Contract on this Project with any Subcontractor or material man where there exists any identity of interest.

GC-75 CLEANING UP

Contractor shall, at all times, at its expense, keep its work areas in a neat, clean and safe condition. Upon completion of any portion of the work, Contractor shall, within forty-eight (48) hours, remove all of its equipment, construction plant, temporary structures and surplus materials not to be used at or near the same location during later stages of work.

GC-76 NOT USED – PROJECT SIGNS

GC-77 NOT USED – CONSTRUCTION INCENTIVE PROGRAM

SPECIAL CONDITIONS

SC-1 SPECIAL CONDITIONS

The following supplements modify, change, delete from, or add to the General Conditions of this Contract. Where any paragraph or subparagraph is modified or deleted by these supplements, the unaltered provision of that paragraph, subparagraph or clause shall remain in effect.

SC-2 LIMITATION OF LIABILITY/ NO WAIVER

Except for personal injury, death or damage to tangible property, Motorola's total liability, whether for breach of contract, warranty, negligence, strict liability in tort, indemnification, or otherwise, will be limited to the direct damages recoverable under law, but not to exceed the Contract Price. **ALTHOUGH THE PARTIES ACKNOWLEDGE THE POSSIBILITY OF SUCH LOSSES OR DAMAGES, THEY AGREE THAT MOTOROLA WILL NOT BE LIABLE FOR ANY COMMERCIAL LOSS; INCONVENIENCE; LOSS OF USE, TIME, DATA, GOOD WILL, REVENUES, PROFITS OR SAVINGS; OR OTHER SPECIAL, INCIDENTAL, INDIRECT, OR CONSEQUENTIAL DAMAGES IN ANY WAY RELATED TO OR ARISING FROM THIS CONTRACT, THE SALE OR USE OF THE EQUIPMENT OR SOFTWARE, OR THE PERFORMANCE OF SERVICES BY MOTOROLA PURSUANT TO THIS CONTRACT.** This limitation of liability provision survives the expiration or termination of the Contract and applies notwithstanding any contrary provision. No action for contract breach or otherwise relating to the transactions contemplated by this Contract may be brought more than one (1) year after the accrual of the cause of action, except for money due upon an open account.

SC-3 TRAINING

Any training to be provided by Motorola to Customer will be described in the Statement of Work. Customer will notify Motorola immediately if a date change for a scheduled training program is required. If Motorola incurs additional costs because Customer reschedules a training program less than thirty (30) days before its scheduled start date, Motorola may recover these additional costs.

SC-4 SYSTEM ACCEPTANCE

Refer to RFP Exhibit B, SCOPE OF WORK, SECTION 15, SUBSTANTIAL COMPLETION AND FINAL ACCEPTANCE.

SC-5 WARRANTY

REFER TO RFP EXHIBIT B, SCOPE OF WORK, SECTION 13, WARRANTY AND MAINTENANCE REQUIREMENTS.

The following terms augment the Warranty Conditions defined in RFP Exhibit B. The RFP Exhibit B language takes precedence in the event of a conflict, with the exception that Motorola

will repair or replace defective Equipment. Motorola will not be required to redesign defective Equipment.

“Warranty Period” means one (1) year from the date of Final System Acceptance.

SYSTEM FUNCTIONALITY. Motorola represents that the System will perform in accordance with the Specifications in all material respects. Upon Final Acceptance, this System functionality representation is fulfilled. Motorola is not responsible for System performance deficiencies that are caused by ancillary equipment not furnished by Motorola which is attached to or used in connection with the System or for reasons or parties beyond Motorola’s control, such as natural causes; the construction of a building that adversely affects the microwave path reliability or radio frequency (RF) coverage; the addition of frequencies at System sites that cause RF interference or intermodulation; or Customer changes to load usage or configuration outside the Specifications.

EQUIPMENT WARRANTY. During the Warranty Period, Motorola warrants that the Equipment under normal use and service will be free from material defects in materials and workmanship.

MOTOROLA SOFTWARE WARRANTY. Motorola warrants the Motorola Software in accordance with the terms of the Software License Agreement and the provisions of this Section that are applicable to the Motorola Software.

EXCLUSIONS TO EQUIPMENT AND MOTOROLA SOFTWARE WARRANTIES. These warranties do not apply to: (i) defects or damage resulting from: use of the Equipment or Motorola Software in other than its normal, customary, and authorized manner; accident, liquids, neglect, or acts of God; testing, maintenance, disassembly, repair, installation, alteration, modification, or adjustment not provided or authorized in writing by Motorola; Customer’s failure to comply with all applicable industry and OSHA standards; (ii) breakage of or damage to antennas unless caused directly by defects in material or workmanship; (iii) Equipment that has had the serial number removed or made illegible; (iv) batteries (because they carry their own separate limited warranty) or consumables; (v) scratches or other cosmetic damage to Equipment surfaces that does not affect the operation of the Equipment; and (vi) normal or customary wear and tear.

WARRANTY CLAIMS. To assert a warranty claim, Customer must notify Motorola in writing or electronically to specifically open a system support case of the claim before the expiration of the Warranty Period. Upon receipt of this notice, Motorola will investigate the warranty claim. If this investigation confirms a valid warranty claim, Motorola will (at its option and at no additional charge to Customer) repair the defective Equipment or Motorola Software, replace it with the same or equivalent product, or refund the price of the defective Equipment or Motorola Software. That action will be the full extent of Motorola’s liability for the warranty claim. If this investigation indicates the warranty claim is not valid, then Motorola may invoice Customer for responding to the claim on a time and materials basis using Motorola’s then current labor rates. Repaired or replaced product is warranted for the balance of the original applicable warranty period. All replaced products or parts will become the property of Motorola.

ORIGINAL END USER IS COVERED. THESE EXPRESS LIMITED WARRANTIES ARE EXTENDED BY MOTOROLA TO THE ORIGINAL USER PURCHASING THE SYSTEM FOR COMMERCIAL, INDUSTRIAL, OR GOVERNMENTAL USE ONLY, AND Are not assignable or transferable.

DISCLAIMER OF OTHER WARRANTIES. THESE WARRANTIES ARE THE COMPLETE WARRANTIES FOR THE EQUIPMENT AND MOTOROLA SOFTWARE PROVIDED UNDER THIS CONTRACT AND ARE GIVEN IN LIEU OF ALL OTHER WARRANTIES. MOTOROLA DISCLAIMS ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE

SC-6 MAINTENANCE SERVICE

Refer to Appendix G Maintenance Service Agreement

SC-7 PRESERVATION OF MOTOROLA'S PROPRIETARY RIGHTS

Motorola, the third party manufacturer of any Equipment, and the copyright County of any Non-Motorola Software own and retain all of their respective Proprietary Rights in the Equipment and Software, and nothing in this Contract is intended to restrict their Proprietary Rights. All intellectual property developed, originated, or prepared by Motorola in connection with providing to Customer the Equipment, Software, or related services remain vested exclusively in Motorola, and this Contract does not grant to Customer any shared development rights of intellectual property. Except as explicitly provided in the Software License, Motorola does not grant to Customer, either directly or by implication, estoppel, or otherwise, any right, title or interest in Motorola's Proprietary Rights. Customer will not modify, disassemble, peel components, decompile, otherwise reverse engineer or attempt to reverse engineer, derive source code or create derivative works from, adapt, translate, merge with other software, reproduce, distribute, sublicense, sell or export the Software, or permit or encourage any third party to do so. The preceding sentence does not apply to Open Source Software which is governed by the standard license of the copyright County.

SC-8 ADMINISTRATOR LEVEL ACCOUNT ACCESS

Motorola will provide Customer with Administrative User Credentials. Customer agrees to only grant Administrative User Credentials to those personnel with the training or experience to correctly use the access. Customer is responsible for protecting Administrative User Credentials from disclosure and maintaining Credential validity by, among other things, updating passwords when required. Customer may be asked to provide valid Administrative User Credentials when in contact with Motorola System support. Customer understands that changes made as the Administrative User can significantly impact the performance of the System. Customer agrees that it will be solely responsible for any negative impact on the System or its users by any such changes. System issues occurring as a result of changes made by an Administrative User may impact Motorola's ability to perform its obligations under the Contract or its Maintenance and Support Agreement. In such cases, a revision to the appropriate provisions of the Contract, including the Statement of Work, may be necessary. To the extent Motorola provides assistance

to correct any issues caused by or arising out of the use of or failure to maintain Administrative User Credentials, Motorola will be entitled to bill Customer and Customer will pay Motorola on a time and materials basis for resolving the issue.

SC-9 SOFTWARE LICENSE AGREEMENT

Refer to Appendix “B”, Motorola Software License Agreement.

Motorola Software. Motorola shall grant to the County, a nonexclusive, non-transferrable and fully paid software license, to use all software, as herein defined and described in this Contract and related documentation. The software license(s) shall include, at no additional cost to the County, any improvements, additions or modifications (up-dates), up to time of Final System Acceptance, version or versions of the Software and Software Documentation licensed under this Contract.

Non-Motorola Software. Any Non-Motorola Software is licensed to County in accordance with the Motorola License Agreement in Appendix "B" ("License"), terms, and restrictions of the copyright County on the Effective Date unless the copyright County has granted to Motorola the right to sublicense the Non-Motorola Software pursuant to the Software License Agreement, in which case the License applies and the copyright County will have all of licensor's rights and protections under the License. Motorola makes no warranties of any kind regarding Non-Motorola Software. Non-Motorola Software may include Open Source Software.

Open Source Software. All Open Source Software is licensed to County in accordance with, and County agrees to abide by, the provisions of the standard license of the copyright County and not the Software License Agreement. Upon request by County, Motorola will use commercially reasonable efforts to determine whether any Open Source Software will be provided under this Contract; and if so, identify the Open Source Software and provide to County a copy of the applicable standard license (or specify where that license may be found); and provide to County a copy of the Open Source Software source code if it is publicly available without charge (although a distribution fee or a charge for related services may be applicable).

Motorola represents that all Software is fully functional with the Equipment and System included in this Contract.

SC-10 STANDARD OF CARE

Motorola, by the execution of this Contract represents that it is possessed of a unique degree of care, learning, skill, and ability than that which is ordinarily possessed by other members of its industry and profession and, further, contracts that in the performance of the duties herein set forth it will furnish its professional skill and judgment with a high degree of care and diligence in accordance with the highest standards of professional practices in the industry and in accordance with applicable federal, state and local laws, statutes, ordinances, codes, orders, rules, and regulations and administrative interpretations thereof.

Motorola represents that it shall design, manufacture, install, and test for compliance, fully functional System which meets or exceeds all of the requirements of the County as set forth in

this Contract and that will be compatible with the County's existing RF Infrastructure as specified in table 1.0. Motorola agrees that the design of the system will ensure interoperability with all P25 Radio and Console Subsystems that comply to P25 TIA 102.BACA for voice and TIA 102.BACD for supplementary data interoperability. Only the features which are defined by P25 ISSI standard, have been implemented and are in common between ISSI vendors are supported. Motorola represents that the System which it is designing and supplying to the County will comply with all applicable Federal, State, and local laws, codes, rules, and regulations. Motorola represents that, except as specifically excluded in this Contract, the Prices set forth in Appendix D incorporates all compensation for Motorola for all services, materials, equipment, structures required to supply the County with a fully functional system which meets or exceeds, in all aspects, the system described in this Contract.

Motorola has visited all sites required for successful implementation of the Project, become familiar with local conditions under which the work is to be performed and correlated personal observations with the requirements of the Project. Based on that review, Motorola represents that it has sufficient information to perform the work specified in the Contract Documents.

SC-11 SURVIVAL OF TERMS

The following provisions will survive the expiration or termination of this Contract for any reason: GC-31 Insurance; GC-29 Patent Indemnity; GC-30 Indemnity; SC-2 Limitation of Liability; SC-5 Disclaimer of Implied Warranties; SC-7 Proprietary Rights and Appendix B Software License Agreement.

SC-12 PUBLIC RECORDS LAW

Confidentiality Obligation. Each party is a disclosing party ("Discloser") and a receiving party ("Recipient") under this Contract. In order for the following provisions to apply, the Discloser must identify what qualifies as Confidential Information upon disclosure to the Recipient. During the term of this Contract and for a period of three (3) years from the date of expiration or termination of this Contract, Recipient will (i) not disclose Confidential Information to any third party; (ii) restrict disclosure of Confidential Information to only those employees (including, but not limited to, employees of any wholly owned subsidiary, a parent company, any other wholly owned subsidiaries of the same parent company), agents or consultants who must be directly involved with the Confidential Information for the purpose and who are bound by confidentiality terms substantially similar to those in this Contract; (iii) not reverse engineer, de-compile or disassemble any Confidential Information; (iv) use the same degree of care as for its own information of like importance, but at least use reasonable care, in safeguarding against disclosure of Confidential Information; (v) promptly notify Discloser upon discovery of any unauthorized use or disclosure of the Confidential Information and take reasonable steps to regain possession of the Confidential Information and prevent further unauthorized actions or other breach of this Contract; and (vi) only use the Confidential Information as needed to fulfill this Contract.

Required Disclosure. If a Recipient is required to disclose Confidential Information pursuant to applicable law, statute, or regulation, or court order, the Recipient will give to the Discloser prompt written notice of the request and a reasonable opportunity to object to such disclosure

and seek a protective order or appropriate remedy. If, in the absence of a protective order, the Recipient determines, upon the advice of counsel, that it is required to disclose such information, it may disclose only Confidential Information specifically required and only to the extent required to do so. Motorola represents that it has a full understanding of FS 119 and that in the event that it seeks protection from disclosure pursuant to this Section that it will do so in the timeframes required by FS 119 and all defenses of those protections are at Motorola's expense.

Confidential Exceptions. Recipient is not obligated to maintain as confidential, Confidential Information that Recipient can demonstrate by documentation (i) is now available or becomes available to the public without breach of this Contract; (ii) is explicitly approved for release by written authorization of Discloser; (iii) is lawfully obtained from a third party or parties without a duty of confidentiality; (iv) is known to the Recipient prior to such disclosure; or (v) is independently developed by Recipient without the use of any Discloser's Confidential Information or any breach of this Contract.

Ownership and Retention. All Confidential Information remains the property of the Discloser and will not be copied or reproduced without the express written permission of the Discloser, except for copies that are absolutely necessary in order to fulfill this Contract. Within ten (10) days of receipt of Discloser's written request, Recipient will return all Confidential Information to Discloser along with all copies and portions thereof, or certify in writing that all such Confidential Information has been destroyed. However, Recipient may retain one (1) archival copy of the Confidential Information that it may use only in case of a dispute concerning this Contract. No license, express or implied, in the Confidential Information is granted other than to use the Confidential Information in the manner and to the extent authorized by this Contract. The Discloser warrants that it is authorized to disclose any Confidential Information it discloses pursuant to this Contract.

SC-13 INTENT TO INSIST IDENTIFIED TEAM MEMBERS EXECUTE PROJECT

The County insists that those indicated as a part of the Motorola's team actually execute the project and that the Project Manager Motorola be continually involved with the project unless agreed to the contrary by County, or their employment with the Respondent is terminated.

SC-14 EQUAL EMPLOYMENT EMPLOYER

The Respondent must be an equal employment opportunity employer. Each Respondent must complete, sign and furnish with its Response the statement titled "Statement of Participation in Contracts Subject to Nondiscrimination Clause", which is incorporated in the Response Certification Form attached hereto as Exhibit "D" to the RFP. Failure to complete this statement will be cause for rejection of the Response.

SC-15 AFFIRMATIVE ACTION PROGRAM

Pursuant to Executive Order 11246, as amended, Palm Beach County does have an Affirmative Action Program in connection with equal employment opportunities. It is recommended that

those Respondents who have not initiated an Affirmative Action Program give consideration toward pursuing such programs.

SC-16 CRIMINAL HISTORY RECORDS CHECK

If Contractor's employees or subcontractors' employees are required under this contract to enter a "critical facility" as identified in Resolution R2013-1421, those employees shall undergo a criminal history record check in order to be granted access pursuant to the latest version of Chapter 2, Article IX of the Palm Beach County Code. In addition, for access to a Palm Beach County Sheriff's Office facility, an additional criminal history records check will be required.

Prior to commencement of work within a critical facility, the Contractor shall make arrangements through the County's Electronic Services and Security Division/Access section for its employees and those of its subcontractors to have finger print based criminal history record checks performed. Those employees clear of disqualifying offenses will be granted an ID badge which must be worn at all times. A list of disqualifying offenses is available upon request. Any person found to have a disqualifying criminal offense will be denied unescorted access to the project. The Contractor will be charged a nominal fee for lost cards.

Although County agrees to pay for all applicable FDLE/FBI fees required for criminal history record checks, the Contractor shall be solely responsible for all direct and indirect costs associated with complying with Chapter 2, Article IX of the Palm Beach County Code.

SC-17 SMALL BUSINESS ENTERPRISE (SBE) PROGRAM

The County has established a minimum goal of 15% SBE participation of the contract price, as amended from time to time. Although not part of the selection consideration, the Respondents are encouraged to identify opportunities for participation by Palm Beach County certified SBEs as they are preparing their proposals and as they may arise during the course of the Contract.

SC-18 PUBLIC CONSTRUCTION BOND

Within ten (10) business days of concluding negotiation on the final Contract, the Respondent shall furnish to the County, on forms provided by the County, the following:

- Public Construction Bond in the Amount of \$16,897,869.
- Form of Guarantee

Such Public Construction Bond shall incorporate by reference all of the terms and conditions of the Contract Documents, including but not limited to the Respondent and Surety's obligation for liquidated damages as well as Surety's acknowledgment regarding any and all provisions addressing or regarding "no damages for delay", as provided for in the General Conditions.

The Surety Company, in addition to the above requirements, shall be currently listed with the United States Department of Treasury for an amount greater than the Contract amount. The

Respondent, at the time of his/her execution of the Contract, shall provide, with the Public Construction Bond described above, a copy of the surety company's current valid Certificate of Authority issued by the United States Department of the Treasury under SS 31, U.S.C. 9304-9308.

The Respondent shall require the attorney-in-fact who executes the required bonds on behalf of the Surety to affix thereto a certified and current copy of his Power of Attorney. If Respondent obtains bonds from any Subcontractor, Palm Beach County shall be named as additional obligee.

SC-19 INSURANCE REQUIREMENTS

The selected Respondent shall furnish to the County certificates of insurance evidencing the existence of current valid, and binding insurance policies for the limits and coverage in accordance with the requirements delineated in the General Conditions, where such insurance is to be provided by the Respondent, or as otherwise modified within the Contract Documents. Motorola will be responsible for its insurance deductibles.

SC-20 OFFICE OF THE INSPECTOR GENERAL

Palm Beach County has established the Office of the Inspector General which is authorized and empowered to review past, present and proposed County contracts, transactions, accounts and records. All contractors and parties doing business with the County shall fully cooperate with the Inspector General including providing access to records relating to this RFP and any resulting contract. The Inspector General has the power to subpoena witnesses, administer oaths, require the production of records, and audit, investigate, monitor, and inspect the activities of the Respondent, its officers, agents, employees, and lobbyists in order to ensure compliance with contract specifications and detect corruption and fraud.

SC-21 TITLE AND SHIPPING ADDRESSES

Title to the Equipment will pass to Customer upon final system acceptance. Title to Software will not pass to Customer at any time. The address which is the final destination where the Equipment will be delivered and installed will be Customer Designated Sites within Palm Beach County.

APPENDIX B SOFTWARE LICENSE AGREEMENT

This Appendix B Software License Agreement ("License") is between Motorola Solutions, Inc. ("Motorola") and Palm Beach County in Florida ("Licensee"). For good and valuable consideration, the parties agree as follows:

Section 1 DEFINITIONS

1.1 "Designated Products" means products provided by Motorola to Licensee with which or for which the Software and Documentation is licensed for use.

1.2 "Documentation" means product and software documentation that specifies technical and performance features and capabilities, and the user, operation and training manuals for the Software (including all physical or electronic media upon which such information is provided).

1.3 "Open Source Software" means software with either freely obtainable source code, license for modification, or permission for free distribution.

1.4 "Open Source Software License" means the terms or conditions under which the Open Source Software is licensed.

1.5 "Primary Contract" means the Project No. 14212 Contract to which this Appendix is attached.

1.6 "Security Vulnerability" means a flaw or weakness in system security procedures, design, implementation, or internal controls that could be exercised (accidentally triggered or intentionally exploited) and result in a security breach such that data is compromised, manipulated or stolen or the system damaged.

1.7 "Software" (i) means proprietary software in object code format, and adaptations, translations, de-compilations, disassemblies, emulations, or derivative works of such software; (ii) means any modifications, enhancements, new versions and new releases of the software provided by Motorola; and (iii) may contain one or more items of software owned by a third party supplier. The term "Software" does not include any third party software provided under separate license or third party software not licensable under the terms of this License.

Section 2 SCOPE

Motorola and Licensee enter into this License in connection with Motorola's delivery of certain proprietary Software or products containing embedded or pre-loaded proprietary Software, or both. This License contains the terms and conditions of the license Motorola is providing to Licensee, and Licensee's use of the Software and Documentation.

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solely in connection with Licensee's use of the Designated Products. This License does not grant any rights to source code.

3.2. If the Software licensed under this License contains or is derived from Open Source Software, the terms and conditions governing the use of such Open Source Software are in the Open Source Software Licenses of the copyright owner and not this License. If there is a conflict between the terms and conditions of this License and the terms and conditions of the Open Source Software Licenses governing Licensee's use of the Open Source Software, the terms and conditions of the license grant of the applicable Open Source Software Licenses will take precedence over the license grants in this License. If requested by Licensee, Motorola will use commercially reasonable efforts to: (i) determine whether any Open Source Software is provided under this License; (ii) identify the Open Source Software and provide Licensee a copy of the applicable Open Source Software License (or specify where that license may be found); and, (iii) provide Licensee a copy of the Open Source Software source code, without charge, if it is publicly available (although distribution fees may be applicable).

Section 4 LIMITATIONS ON USE

4.1. Licensee may use the Software only for Licensee's internal business purposes and only in accordance with the Documentation. Any other use of the Software is strictly prohibited. Without limiting the general nature of these restrictions, Licensee will not make the Software available for use by third parties on a "time sharing," "application service provider," or "service bureau" basis or for any other similar commercial rental or sharing arrangement.

4.2. Licensee will not, and will not allow or enable any third party to: (i) reverse engineer, disassemble, peel components, decompile, reprogram or otherwise reduce the Software or any portion to a human perceptible form or otherwise attempt to recreate the source code; (ii) modify, adapt, create derivative works of, or merge the Software; (iii) copy, reproduce, distribute, lend, or lease the Software or Documentation to any third party, grant any sublicense or other rights in the Software or Documentation to any third party, or take any action that would cause the Software or Documentation to be placed in the public domain; (iv) remove, or in any way alter or obscure, any copyright notice or other notice of Motorola's proprietary rights; (v) provide, copy, transmit, disclose, divulge or make the Software or Documentation available to, or permit the use of the Software by any third party or on any machine except as expressly authorized by this License; or (vi) use, or permit the use of, the Software in a manner that would result in the production of a copy of the Software solely by activating a machine containing the Software. Licensee may make one copy of Software to be used solely for archival, back-up, or disaster recovery purposes; *provided* that Licensee may not operate that copy of the Software at the same time as the original Software is being operated. Licensee may make as many copies of the Documentation as it may reasonably require for the internal use of the Software.

4.3. Unless otherwise authorized by Motorola in writing, Licensee will not, and will not enable or allow any third party to: (i) install a licensed copy of the Software on more than one unit of a Designated Product; or (ii) copy onto or transfer Software installed in one unit of a Designated Product onto one other device. Licensee may temporarily transfer Software installed on a Designated Product to another device if the Designated Product is inoperable or malfunctioning, if Licensee provides written notice to Motorola of the temporary transfer and identifies the device on which the Software is transferred. Temporary transfer of the Software to another device must be discontinued when the original Designated Product is returned to operation and the Software must be removed from the other device. Licensee must provide prompt written notice to Motorola at the time temporary transfer is discontinued.

4.4. When using Motorola's Radio Service Software ("RSS"), Licensee must purchase a separate license for each location at which Licensee uses RSS. Licensee's use of RSS at a licensed location does

not entitle Licensee to use or access RSS remotely. Licensee may make one copy of RSS for each licensed location. Licensee shall provide Motorola with a list of all locations at which Licensee uses or intends to use RSS upon Motorola's request.

4.5. Licensee will maintain, during the term of this License and for a period of two years thereafter, accurate records relating to this license grant to verify compliance with this License. Motorola or an independent third party ("Auditor") may inspect Licensee's premises, books and records, upon reasonable prior notice to Licensee, during Licensee's normal business hours and subject to Licensee's facility and security regulations. Motorola is responsible for the payment of all expenses and costs of the Auditor. Any information obtained by Motorola and the Auditor will be kept in strict confidence by Motorola and the Auditor and used solely for the purpose of verifying Licensee's compliance with the terms of this License.

Section 5 OWNERSHIP AND TITLE

Motorola, its licensors, and its suppliers retain all of their proprietary rights in any form in and to the Software and Documentation, including, but not limited to, all rights in patents, patent applications, inventions, copyrights, trademarks, trade secrets, trade names, and other proprietary rights in or relating to the Software and Documentation (including any corrections, bug fixes, enhancements, updates, modifications, adaptations, translations, de-compilations, disassemblies, emulations to or derivative works from the Software or Documentation, whether made by Motorola or another party, or any improvements that result from Motorola's processes or, provision of information services). No rights are granted to Licensee under this License by implication, estoppel or otherwise, except for those rights which are expressly granted to Licensee in this License. All intellectual property developed, originated, or prepared by Motorola in connection with providing the Software, Designated Products, Documentation or related services, remains vested exclusively in Motorola, and Licensee will not have any shared development or other intellectual property rights.

Section 6 LIMITED WARRANTY; DISCLAIMER OF WARRANTY

6.1. The commencement date is Final System Acceptance and the term of the Software warranty will be one year from Final System Acceptance (the "Warranty Period"). If Licensee is not in breach of any of its obligations under this License, Motorola warrants that the unmodified Software, when used properly and in accordance with the Documentation and this License, will be free from a reproducible defect that eliminates the functionality or successful operation of a feature critical to the primary functionality or successful operation of the Software. Whether a defect occurs will be determined by Motorola solely with reference to the Documentation. Motorola does not warrant that Licensee's use of the Software or the Designated Products will be uninterrupted, error-free, completely free of Security Vulnerabilities, or that the Software or the Designated Products will meet Licensee's particular requirements. Motorola makes no representations or warranties with respect to any third party software included in the Software.

6.2 Motorola's sole obligation to Licensee and Licensee's exclusive remedy under this warranty is to use reasonable efforts to remedy any material Software defect covered by this warranty. These efforts will involve either replacing the media or attempting to correct significant, demonstrable program or documentation errors or Security Vulnerabilities. If Motorola cannot correct the defect within a reasonable time, then at Motorola's option, Motorola will replace the defective Software with functionally-equivalent Software, license to Licensee substitute Software which will accomplish the same objective, or terminate the license and refund the Licensee's paid license fee.

6.3. Warranty claims are described in the Primary Contract.

6.4. The express warranties set forth in this Section 6 are in lieu of, and Motorola disclaims, any and all other warranties (express or implied, oral or written) with respect to the Software or Documentation, including, without limitation, any and all implied warranties of condition, title, non-infringement, merchantability, or fitness for a particular purpose or use by Licensee (whether or not Motorola knows, has reason to know, has been advised, or is otherwise aware of any such purpose or use), whether arising by law, by reason of custom or usage of trade, or by course of dealing. In addition, Motorola disclaims any warranty to any person other than Licensee with respect to the Software or Documentation.

Section 7 TRANSFERS

Licensee will not transfer the Software or Documentation to any third party without Motorola's prior written consent. Motorola's consent may be withheld at its discretion and may be conditioned upon transferee paying all applicable license fees and agreeing to be bound by this License. If the Designated Products are Motorola's radio products and Licensee transfers ownership of the Motorola radio products to a third party, Licensee may assign its right to use the Software (other than RSS and Motorola's FLASHport® software) which is embedded in or furnished for use with the radio products and the related Documentation; *provided* that Licensee transfers all copies of the Software and Documentation to the transferee, and Licensee and the transferee sign a transfer form to be provided by Motorola upon request, obligating the transferee to be bound by this License.

Section 8 TERM AND TERMINATION

8.1 Licensee's right to use the Software and Documentation will begin when the Primary Contract is signed by both parties and will continue for the life of the Designated Products with which or for which the Software and Documentation have been provided by Motorola, unless Licensee breaches this License, in which case this License and Licensee's right to use the Software and Documentation may be terminated immediately upon notice by Motorola.

8.2 Within thirty (30) days after termination of this License, Licensee must certify in writing to Motorola that all copies of the Software have been removed or deleted from the Designated Products and that all copies of the Software and Documentation have been returned to Motorola or destroyed by Licensee and are no longer in use by Licensee.

8.3 Licensee acknowledges that Motorola made a considerable investment of resources in the development, marketing, and distribution of the Software and Documentation and that Licensee's breach of this License will result in irreparable harm to Motorola for which monetary damages would be inadequate. If Licensee breaches this License, Motorola may terminate this License and be entitled to all available remedies at law or in equity (including immediate injunctive relief and repossession of all non-embedded Software and associated Documentation unless Licensee is a Federal agency of the United States Government). If Licensee's breach of this License is curable, Licensee will cure such breach within twenty-four (24) hours, or as soon thereafter as possible, not to exceed two (2) days.

Section 9 UNITED STATES GOVERNMENT LICENSING PROVISIONS

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Technical Data and Computer Software clause at DFARS 252.227-7013 (OCT 1988), if applicable. The Software and Documentation may or may not include a Restricted Rights notice, or other notice referring to this License. The provisions of this License will continue to apply, but only to the extent that they are consistent with the rights provided to the Licensee under the provisions of the FAR or DFARS mentioned above, as applicable to the particular procuring agency and procurement transaction.

Section 10 CONFIDENTIALITY

Licensee acknowledges that the Software and Documentation contain Motorola's valuable proprietary and Confidential Information and are Motorola's trade secrets, and that the provisions in the Primary Contract concerning Confidential Information apply.

Section 11 LIMITATION OF LIABILITY

The Limitation of Liability provision is described in the Primary Contract.

Section 12 NOTICES

Notices are described in the Primary Contract.

Section 13 GENERAL

13.1. **COPYRIGHT NOTICES.** The existence of a copyright notice on the Software will not be construed as an admission or presumption of publication of the Software or public disclosure of any trade secrets associated with the Software.

13.2. **COMPLIANCE WITH LAWS.** Licensee acknowledges that the Software is subject to the laws and regulations of the United States and Licensee will comply with all applicable laws and regulations, including export laws and regulations of the United States. Licensee will not, without the prior authorization of Motorola and the appropriate governmental authority of the United States, in any form export or re-export, sell or resell, ship or reship, or divert, through direct or indirect means, any item or technical data or direct or indirect products sold or otherwise furnished to any person within any territory for which the United States Government or any of its agencies at the time of the action, requires an export license or other governmental approval. Violation of this provision is a material breach of this License.

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13.5. **THIRD PARTY BENEFICIARIES.** This License is entered into solely for the benefit of Motorola and Licensee. No third party has the right to make any claim or assert any right under this License, and no third party is deemed a beneficiary of this License. Notwithstanding the foregoing, any

licensor or supplier of third party software included in the Software will be a direct and intended third party beneficiary of this License.

13.6. SURVIVAL. Sections 4, 5, 6.3, 7, 8, 9, 10, 11 and 13 survive the termination of this License.

13.7. ORDER OF PRECEDENCE. In the event of inconsistencies between this Appendix and the Primary Contract, the parties agree that this Appendix prevails, only with respect to Software.

13.8 SECURITY. Motorola uses reasonable means in the design and writing of its own Software and the acquisition of third party Software to limit Security Vulnerabilities. While no software can be guaranteed to be free from Security Vulnerabilities, if a Security Vulnerability is discovered, Motorola will take the steps set forth in Section 6 of this License.

APPENDIX C - TAB 7

PROJECT APPROACH NEGOTIATED

APCO P25 TRUNKED SIMULCAST COUNTYWIDE PUBLIC SAFETY RADIO SYSTEM

MAY 21, 2015

PROJECT NO. 14212

TECHNICAL PROPOSAL

PALM BEACH COUNTY RADIO SYSTEM



The design, technical, pricing, and other information ("Information") furnished with this submission is proprietary information of Motorola Solutions, Inc. ("Motorola") and is submitted with the restriction that it is to be used for evaluation purposes only. To the fullest extent allowed by applicable law, the Information is not to be disclosed publicly or in any manner to anyone other than those required to evaluate the Information without the express written permission of Motorola.

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PROJECT APPROACH - NEGOTIATED

7.1 PROJECT MANAGEMENT PLAN

Motorola Solutions, Inc. (Motorola) is an experienced prime contractor and integrator of significant statewide, countywide, and citywide projects. Many members of Motorola's project staff have played key roles in designing and implementing systems similar in size and scope as proposed for Palm Beach County (County).

Motorola is proud of our legacy of industry leadership and our history of close working relationships with many state and local government users.

Motorola has the largest global network of system engineers, technologists, specialists, and project managers—over a thousand professionals—focused on the design, deployment, servicing, and managing of public safety systems around the world. Our personnel have deployed over 1,000 public safety standards-based systems and have developed the system integration expertise and methodologies to deploy mission-critical systems for the public safety and government markets.

Our team of project managers, engineers, and service personnel will be the County's partner for the entire life of the system, from planning and designing the system in the proposal stage, to deploying and integrating the network as quickly, efficiently, and cost-effectively as possible without subordinating quality, cost, or schedule.

As shown in Figure 7-1, our project approach is based on the industry standard Project Management Body of Knowledge (PMBOK) process, a standard developed by the Project Management Institute (PMI). The PMBOK encompasses generally accepted project management methodologies and processes. Motorola's Project Management organization strongly encourages PMI certification, and we require it as a qualification to run complex projects.

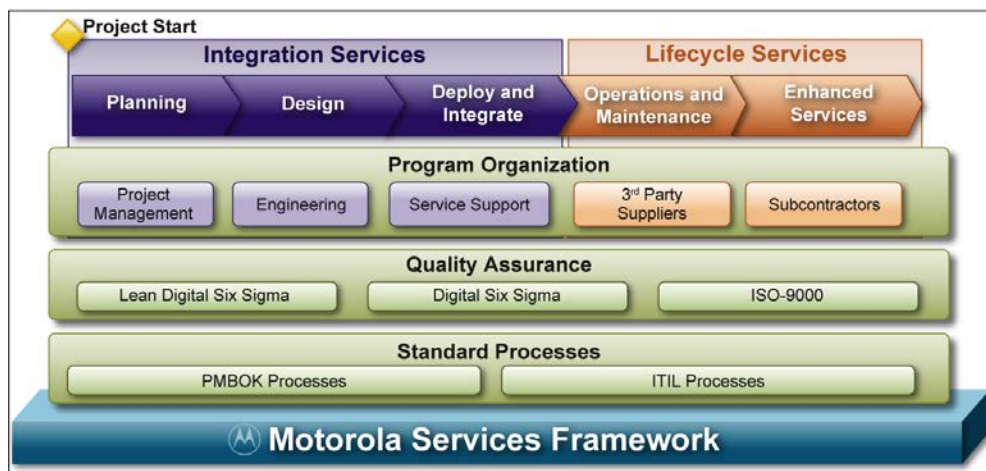


Figure 7-1: Motorola's services framework incorporates the PMI model and PMBOK processes to provide a

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PALM BEACH COUNTY RADIO SYSTEM

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to the restrictions on the cover page.

low-risk implementation of Palm Beach County's complex system

Our approach allows Motorola to control risk, schedule, and costs throughout the term of the contract and partner with the County to meet the scheduled goals and implementation of the system. These Project Management and System Integration skills and processes will be applied to the successful implementation of the County's system, following this detailed Statement of Work (SOW).

7.1.1 System Implementation Overview

Figure 7-2 below is an overview of activities and deliverables for major phases of the system implementation process.

DESIGN REVIEW & CIVIL REVIEW	PROCUREMENT AND STAGING	INSTALLATION	SITE DEVELOPMENT AND MANAGEMENT	ACCEPTANCE TESTING	TRAINING	CUTOVER	TRANSITION TO LIFE CYCLE SUPPORT
ACTIVITY							
<ul style="list-style-type: none">• Capture elements of the system design.• Develop testing procedures.• Develop training plan.	<ul style="list-style-type: none">• Manufacture & purchase equipment.• Factory Staging.• Component Test.• Factory Acceptance Test.	<ul style="list-style-type: none">• Equipment is installed.• System is optimized.		<ul style="list-style-type: none">• Functionality Test.• Coverage Test.• 30 day Burn-in Test.	Train all users per training plan.	Execute cutover plan.	Enter the Warranty period.
DELIVERABLE							
<ul style="list-style-type: none">• Project Plan.• Comms Plan.• Project Schedule.• Quality Plan.• Risk Plan.• Testing Plan.	Shipped system to field after Factory Acceptance Test.	Installation completed as agreed upon CDR.		Successful test completion.	All users trained.	Successful cutover.	Ongoing system maintenance.

Figure 7-2: System Implementation Overview

7.1.2 Project Communication Plan

An effective communications plan between the Motorola project team and Palm Beach County representatives is critical to the success of the project. Effective team integration occurs only when everyone is operating with the same information and all share information in a timely and effective manner. Motorola uses a thorough communications management process for our projects. The advantages of Motorola's communications management process to the County and its supporting agencies are:

- Accurate measure of project success.
- Continuous access to status reports, schedules, and other key documents.
- Provides the field team with immediate fast-track issue resolution information.
- Avoids costly miscommunications.

This communications management approach includes status reporting, stakeholder oversight, document classification, and, online tools and repositories. The communication plan will define and

formalize key meetings, their frequency and required attendees. This will provide the County with meaningful and focused meetings that accomplish the goals and objectives set prior to each meeting.

Motorola's communication plan will identify the key stakeholders and project team members on the project. Communication tools include email, status reports, phone, fax, and websites. These tools will be used by the project team to inform and report on progress during the project. Web tools, specifically Motorola's Compass extranet, will be used to store project information such as site plans, permits, audits and other site development information. Palm Beach County representatives can quickly view the status of each individual site and the progress with respect to the schedule. Site documentation will be readily available for use by both the County and the project team.

Regular bi-weekly and monthly reports are posted on the Compass project extranet website, available to the project community through a secure internet site. These reports will consist of the following:

- Regular reports regarding project status.
- Monthly risk meetings with the County, associated risk lists, and immediate response if a risk item becomes an issue.
- Executive status meetings with County stakeholders as determined by the Palm Beach County project team.
- Process Audit Reports.

Motorola's Compass extranet site will also be used to store and retrieve all project documentation. The County will have online access to project documents such as schedules, status reports, risk logs, requirements documents and change requests. Version control will ensure that the most current documentation and all past versions are available for review.

Status reports will highlight any potential issues and identify the action being taken to mitigate them. Action items will be assigned to individuals and completion dates will be tracked to ensure the items are completed. Status Reports will also be used to provide CRESA with an accurate assessment of the progress of the project and give visibility to the resource requirements to complete the near term tasks. Action item lists will be maintained and updated on a weekly basis to identify and quickly resolve identified items.

The final Project Communication Plan will be finalized as part of the Customer Design Review.

7.1.3 Quality Assurance Plan

It is Motorola's policy to produce and provide products and services of the highest quality that meet or exceed the needs of our customers. Motorola has a well-established reputation for designing and developing high quality products and systems on schedule and within budget. Motorola will perform all work consistent with high quality commercial practices and in accordance with Motorola's quality standards for fixed equipment installations and all applicable manufacturer installation and maintenance manuals. Motorola will comply with all applicable standards such as Electronics Industries Association (EIA) and FCC standards and regulations in effect at the time of contract execution.

An effective Quality Assurance / Quality Control Plan is essential in order to deliver to the County a best-in-class radio system. Our comprehensive Quality Management System (QMS), shown in Figure 7-3, outlines the policies, procedures and processes for dynamically improving business performance.

Motorola has selected the ISO 9001 Quality Management System as the quality management system standard to control our business activities. We have developed a quality manual that includes the scope of the quality management system, documented procedures established for the quality management system, and a description of the interaction between the processes of the quality management system.

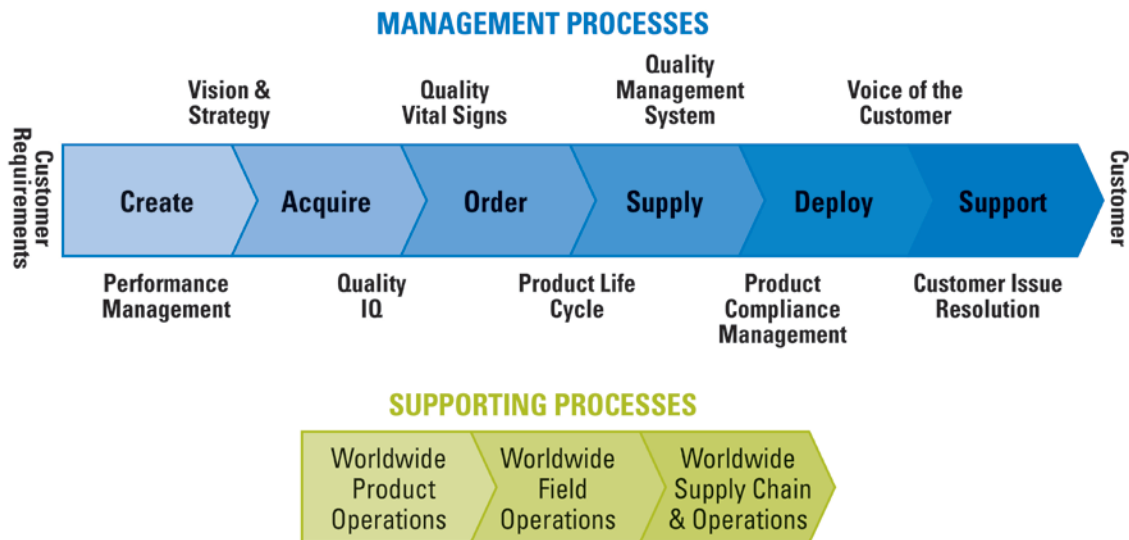


Figure 7-3: Motorola's customer-focused quality processes

The International Organization for Standardization's ISO 9000 series describes standards for a quality management system addressing the processes surrounding the design, development and delivery of a general product or service. Organizations can participate in a continuing certification process to demonstrate their continuous quality improvement, effectiveness with quality management and compliance with the standards.

In addition to our ISO 9001 Quality Management Certification, Motorola has a robust Environmental, Health, and Safety policy. Our stated vision for EHS is to be a globally recognized benchmark within our industry for successful integration of environmental, health, safety and corporate responsibility principles in company's day-to-day operations to ensure superior business performance. Motorola facilities are also certified to the ISO 14001:2008 and OSHAS: 2007 standards.

Another pillar of Motorola's focus on quality is our desire to improve our processes to drive costs out of our products and services through our Services Process Improvement program. This program is based upon the Six Sigma philosophy and strategy. It seeks to improve the quality of process outputs by identifying and removing the causes of defects (errors) and minimizing variability in manufacturing, services and business processes. It uses a set of quality management methods, including statistical methods, and creates a special infrastructure of people within the organization ("Black Belts", "Green Belts", etc.) who are experts in these methods.

More recently, Motorola has embraced the Lean Six Sigma—or simply Lean—strategy which even more rapidly addresses opportunities to drive costs out of our project implementations. Currently, our Services Process Improvement Program has nearly forty active improvement projects in our North America Services operation alone—all with the common goal of driving costs out of our business processes.

7.1.3.1 Quality Assurance Steps and Procedures

Since Motorola's QMS is an end to end quality management system, the entire span of the project is monitored continuously for adherence to quality deliverables. Quality is assured through vigilance in active management techniques. This section outlines the Quality Control Plan (QCP) steps and procedures that will be used by Motorola in the implementation of the project from proposal through final acceptance.

The QCP for Palm Beach County identifies processes and activities that are monitored for quality metric compliance, represented in Table 7-1: below.

Table 7-1: Processes in place to verify quality in specific implementation and deployment activities.

Deployment	System	Assurance
System Design	<ul style="list-style-type: none">▪ System Requirements▪ Design Review▪ Site Design	<ul style="list-style-type: none">▪ Compliance to Requirements▪ Joint approval
Project Management	<ul style="list-style-type: none">▪ SI-Gates▪ Status Reports▪ Status Meetings▪ Project Schedule▪ Issue Tracking Log▪ Risk Analysis	<ul style="list-style-type: none">▪ Supervision▪ Sample Inspection▪ Audits▪ Project Reviews▪ PMO Governance▪ Dedicated Master Schedule
Grounding/Electrical/Power Installation	<ul style="list-style-type: none">▪ Drawings/Electrical Plan▪ National and Local Codes▪ Motorola R56 Standards	<ul style="list-style-type: none">▪ Supervision▪ Sample Inspection
Network Equipment Installation	<ul style="list-style-type: none">▪ Motorola R56 Standards▪ System Design▪ Diagrams/Documentation▪ Optimization Procedures	<ul style="list-style-type: none">▪ Supervision▪ Sample Inspection
System Acceptance	<ul style="list-style-type: none">▪ Equipment Verification▪ Feature/Functionality Testing▪ Coverage Testing	<ul style="list-style-type: none">▪ Sample Inspection▪ Contract Review

7.1.3.2 Design Analysis and Verification

Design Review meetings will be held between Motorola and the County to review the system design and project plan. The design and plan will be agreed upon and approved before the project proceeds.

The Design Review is structured for alignment with the schedule for deployment of the P25 system. Design agreement and approval by Palm Beach County and Motorola will ensure a common understanding of system parameters and expected performance.

7.1.3.3 Design Changes and Document Control

Any change in system design/project scope will be managed through a Change Order. The Change Order will be approved and signed by both Motorola and the County. Key project documents will be controlled through a centralized file repository and these documents will have version control fields.



7.1.3.4 Factory Staging

A critical quality assurance step is the factory staging of Palm Beach County's system equipment at Motorola's Customer Center for Solutions Integration (CCSi), an ISO 9000 certified process. Staging equipment at CCSi will provide a central point, in a controlled environment, to test the functionality of the system and the proper operation of all critical components. Access to development engineering and Motorola's lab resources further enhance the benefits of staging. Since equipment cabling is factory made and tested field installation and optimization cycle time will be significantly reduced while the possibility of introducing cabling errors during installation is virtually eliminated. Equipment is also labeled and inventoried at CCSi in an efficient and consistent manner in compliance with the County's requirements.

7.1.3.5 Material Receiving, Storage, and Shipping / Equipment Inventory and Tracking

Equipment packing and inventory lists will be used to manage equipment logistics and warehousing. CCSi's bar coding system will be used to label all equipment shipped from CCSi. Shock sensors will be applied to sensitive equipment to determine if damage may have occurred during transit. An inventory and maintenance tracking system will be used to track inventory as it moves from shipment through installation to reduce lost or missing equipment.

7.1.3.6 Installation Personnel Training and Certification

All Motorola installation personnel are trained on Motorola R56 installation guidelines.

7.1.3.7 Field Installation and Inspection

Motorola local installation teams will install per our quality standards and Motorola's team will inspect the equipment at the County's sites as they are installed and commissioned.

7.1.3.8 Non-Conforming Products/Modules/Components

Equipment that is found not to be in conformance with published specifications will be tagged, repaired, and/or replaced. Each non-conformance shall have a non-conformance record that will be included in the corrective action report.

7.1.3.9 System Testing and Validation

The core site equipment will be staged at Motorola's facility in Schaumburg, IL. Before the equipment leaves the staging facility, a number of pre-installation performance and functionality tests will be executed to verify that the system is operating properly. After the equipment has been installed in the field, acceptance tests will be executed to verify that the system has been installed correctly and is ready for use. Through the use of a Requirements Traceability Matrix (RTM), the Project Team will be able to correlate system design and performance parameters from design through testing and delivery for traceable requirements management.

7.1.3.10 Training of Palm Beach County Personnel

Motorola will conduct customized training courses to thoroughly train agency personnel on the use of the system, and the County's technical personnel on the operation and support of the system. Motorola's proposed training plan is further detailed in response to Requirement 13.5.1 in Section 5, Point-by-Point Response, Proposer Qualifications, and System Description.



7.1.3.11 Implementation/Migration

A detailed project schedule and migration plan has been created to document system installation and commissioning steps and milestones. The project schedule describes how and when the site/equipment installations will occur. The migration plan describes how and when users will transition to the new system and when it will be put into service. These documents will be reviewed during the detail design review process in conjunction with input from the County once all the existing users have been identified.

7.1.3.12 Project Documentation

Various documents will be used throughout the project lifecycle. The actual project templates and documentation used to verify the adequacy of the actual processes and procedures used to develop and/or deliver products/services will vary based on specific project needs.

7.1.4 Change Control Plan

Motorola's Change Control Process includes elements of scope, cost, schedule, risk, quality, communications, and subcontract management to minimize the need for changes and is utilized on all of our projects, regardless of size. At a high level, Motorola's approach to change management is focused on the consistent application of the elements that make up Motorola's Project Management Methodology:

- **Quality Management:** The project and its deliverables meet Motorola's exacting standards and all Palm Beach County's requirements for quality and performance.
- **Scope Management:** The scope of the project will be managed through the change management process to ensure that any changes in scope are identified and the impact of those changes are communicated and approved prior to implementation. Motorola's integrated team, consisting of Motorola and its subcontractors/suppliers will manage the scope of the project following the same rigorous scope and change management processes to ensure the project is completed on time and on budget.
- **Risk Management:** Motorola's risk management process keeps the potential risks highlighted during the project. As a risk item is eliminated, it is removed from the list, any new risks are added and mitigation plans are developed to minimize the impact of an event to the project.
- **Schedule Management:** Schedules are utilized to manage resources, equipment, subcontractors, and tasks on the project. The schedule management process shows the status of each task and allows the project manager to allocate resources as needed to ensure timely completion of all tasks. This allows optimal use of project resources and reduces the possibility of delays.
- **Communications Management:** Keeps all project stakeholders informed of the status of the project and enables them to get timely information regarding the project progress. Communications Management ensures all team members are kept informed of the upcoming tasks and assignments so they can provide feedback to improve the project performance.
- **Subcontractor Management:** Motorola's subcontractors are critical to the success of the Palm Beach County project and are managed as team members and key contributors. Their experience and expertise enables Motorola to provide the County with world-class technologies and a world class implementation while keeping the project cost effective and predictable.



This proven cost-management methodology has been used successfully to deliver many large projects such as the State of Michigan, State of Minnesota, State of Illinois, and hundreds of other multi-agency projects in the United States and internationally within their anticipated timelines and projected budgets.

Motorola will do the best job possible to understand the requirements and needs of the County and its agency users up front so that a system solution is designed to meet those needs and requirements with as little need for change as possible. For Palm Beach this process has already begun with this proposal, and will continue with regular meetings and dialog through all of the system's lifecycle phases to include; design, design review, and design approval phases, implementation, testing, acceptance, initiation into service, and the Maintenance phase. With even the most rigorous process, some changes are inevitable, and Motorola has a comprehensive Change Control Process in place to streamline the change management process. This section will detail Motorola processes used to manage change during implementation of the County's P25 System.

7.1.4.1 Change Control Objectives

Motorola's project philosophy is to invest in the pre-contract efforts to understand our customer's objectives from the initiation phase of the proposal and to utilize our proven advanced tools to develop a system design, scope of work, and realistic schedule that matches these objectives up front which results in minimized change orders that can improve cost and schedule performance during implementation.

The objective of Motorola's change control process is to manage the project scope, and insure compliance to project timelines and budgetary requirements. Motorola's process includes structured meetings beginning in the System Design Phase between our pre-contract team and our customer. We ensure our understanding of customer needs, goals, objectives, and any special circumstances which need to be addressed to ensure the success of the project.

7.1.4.2 Change Recommendations Based on Gap Analysis

During the pre-contract process, Motorola's engineers and project management team developed a detailed design plan using our advanced coverage tools to ensure the proposed system design meets your needs. Motorola will review the detailed design plan as compared to the requirements with the County. Through the use of Risk Management and Gap Analysis techniques, potential changes can be identified and quantified with the County. When a change is found to be required, Motorola will analyze the potential impact to the entire project and determines whether any adjustments can be made to scope, schedule, or costs to mitigate, neutralize, or offset the impact of the change. The resultant change will be documented in a Change Request and sent to Palm Beach's project team for approval prior to the change being implemented. Due to our extensive pre-contract investment with our customers, Motorola has demonstrated success in minimizing the need for change orders, and thereby minimizes their impact on our customers' budgets.

7.1.4.3 Stakeholder Participation Strategies in Proposing and Prioritizing Changes

During the design review, Motorola and the County will review the proposed solution, including the preliminary design and statement of work, which reflects the requirements as defined in the Request for Proposal (RFP). Motorola's Statement of Work defines Motorola's proposed solution in detail. Our work schedule is detailed down to the individual tasks and deliverables. We have also highlighted stakeholder roles and responsibilities in the SOW.



Also during the design review, the County and Motorola will optimize the proposed phased implementation approach to save time and cost while meeting the County's needs and requirements. Motorola will provide guidance and cost-effective solutions that anticipate not only the current needs and requirements but also allow for enhancements to meet Palm Beach County's future needs. Throughout this interactive process, Palm Beach County, its member agencies, and stakeholders will be afforded opportunities for participative involvement in cost savings, risk mitigation, and the change management process. The County will have ongoing visibility to the project schedule with the ability to make informed decisions regarding any requested changes during the project.

7.1.4.4 Success Factors and Measuring Success

Over the course of the project, through design review, project update meetings, status reports, schedules, and other project deliverables, the measure of success of the project will ultimately be determined by Motorola's adherence to the scope, cost, and schedule milestones. These benchmarks, their variances, and the approved change requests will be used to gauge overall project success. Additionally, the cost savings realized by implementing proactive change orders can have a positive impact in the overall budget performance of the project.

7.1.4.5 Effective Change Management during Project Delivery

Once the project design review is completed and design is approved by the County, Motorola will maintain effective change management during the project to capture the impact of any proposed changes to the requirements during implementation. Motorola will collaborate with the County to determine the impact of any change request with respect to scope, cost, and schedule. Our approach enables us to respond quickly to project changes, adapting our delivery schedule, resource allocation scheme, and individual task assignments when a scope change is required.

7.1.4.6 Palm Beach County Standard Project Forms

Provided on the following pages.



Construction Change Directive (CCD)

PALM BEACH COUNTY CAPITAL IMPROVEMENTS DIVISION	
CONSTRUCTION CHANGE DIRECTIVE (CCD)	
TO:	CCD NUMBER: _____
ATTENTION:	DATE: _____
FROM:	PROJECT NAME: _____
	PROJECT NUMBER: _____
	CONTRACT NUMBER: _____
<p>PROCEED WITH THE FOLLOWING WORK ON A TIME AND MATERIALS BASIS PER GENERAL CONDITION 65.</p> <p>CAUSE FOR THE DIRECTIVE:</p> <p>DESCRIPTION OF WORK:</p> <p style="text-align: center;">NOTIFICATION MUST BE GIVEN TO OWNER PRIOR TO WORK COMMENCING WORK TICKETS MUST BE SIGNED DAILY BY OWNER'S REPRESENTATIVE</p>	
<p>Issued By: _____</p> <p>DESIGN PROFESSIONAL</p> <p>BY: _____ DATE _____</p> <p>NOTE: The Contractor shall submit all documentation for payment of this work within 21 calendar days of the completion of the above referenced CCD.</p> <p>DISTRIBUTION:</p> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%;">OWNER'S REPRESENTATIVE</div> <div style="width: 45%;">DATE</div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 45%;">OWNER</div> <div style="width: 45%;">DATE</div> </div>	

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PALM BEACH COUNTY RADIO SYSTEM



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Project Approach - NEGOTIATED C-74

Construction Change Proposal (CCP)

PALM BEACH COUNTY	
CONSTRUCTION CHANGE PROPOSAL (CCP)	
TO:	CCP NUMBER: _____
	DATE: _____
ATTENTION:	PROJECT NAME: _____
REFERENCE:	PROJECT NUMBER: _____
	CONTRACT NUMBER: _____
<p>We propose to accomplish the MODIFICATIONS identified in FIELD BULLETIN FB #_____ and as described herein. Except as modified below, the original contract and all prior amendments shall remain in full force and effect.</p> <p>DESCRIPTION:</p> <div style="margin-left: 40%;"> PROPOSED CONTRACT PRICE CHANGE (increases) \$ _____ (decrease) (unchanged) </div> <div style="margin-left: 40%;"> PROPOSED CONTRACT TIME CHANGE (increases) _____ days (unchanged) </div> <div style="margin-left: 40%;"> PROPOSED NEW SUBSTANTIAL COMPLETION _____ date </div>	
<div style="float: right; width: 50%;"> FROM: _____ CONTRACTOR </div> <div style="clear: both;"></div> <div style="margin-top: 10px;"> SIGNED: _____ DATE: _____ </div>	

Change Order

PALM BEACH COUNTY		
CHANGE ORDER		
ISSUED TO:	CHANGE ORDER NO.:	
PROJECT: PROJECT NO.	REFERENCE CCP NO.:	
	RESOLUTION NO.:	
	DISTRICT NO.:	
The completion date, contract price, and all terms, covenants, and conditions of the above referenced contract, except as duly modified by this and previous Change Orders, if any, shall remain in full force and effect.		
DESCRIPTION OF CHANGE:		
CONTRACT PRICE Original Contract Price: \$0.00 Previous CO # _____ through _____: \$0.00 This Change Order No. _____: \$0.00 ADJUSTED Contract Price: _____	COMPLETION DATE Contract Completion Date will be increased by <u>insert #days</u> calendar days. Contract Notice to Proceed Date: _____ Contract Substantial Completion Date: _____ ADJUSTED Substantial Completion Date: _____	
CONTRACTOR Execution of this change order acknowledges final settlement of, and releases, all claims for costs and time associated, directly or indirectly, with the above stated modification(s), including all claims for cumulative delays or disruptions resulting from, caused by, or incident to such modifications(s), and including any claim that the above stated modification(s) constitutes, in whole or part, a cardinal change to the contract. The above changes are accepted: Contractor _____ By: _____ Title: _____ Date: _____	DESIGN PROFESSIONAL The above changes are recommended for approval by the Owner: Design Professional _____ By: _____ Title: _____ Date: _____	PALM BEACH COUNTY Recommended By: By: _____ Title: <u>Project Manager</u> Date: _____ By: _____ Title: <u>Director – CID</u> Date: _____ By: _____ Title: <u>Director, FD&O</u> Date: _____ By: _____ Legal Sufficiency – CAO Date: _____ Approved By: By: _____ Shelley Vana, Mayor Title: <u>Mayor</u> Date: _____
Rev. 2/2008		

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Project Approach - NEGOTIATED C-76

Application and Certificate of Payment

APPLICATION AND CERTIFICATE OF PAYMENT

TO (OWNER):	PROJECT: PROJECT #: OWNER'S ACCOUNT #	APPLICATION #
FROM (CONTRACTOR):	VIA (Consultant):	PERIOD ENDING: COMMENCEMENT DATE: ORIGINAL CONTRACT PERIOD: EXTENDED CONTRACT PERIOD: CONTRACT COMPLETION DATE:

CONTRACTOR'S APPLICATION FOR PAYMENT		
CHANGE ORDER SUMMARY		
Change Orders approved in previous months by Owner	ADDITIONS	DEDUCTIONS
TOTAL Thru CO#		
Approved this Month		
No. Date Approved		
TOTALS	0	0
Net change by Change Orders	0	

Application is made for Payment, as shown below, in connection with the Contract. Continuation Sheets are attached.

1. ORIGINAL CONTRACT SUM	\$	0	
2. Net change by Change Orders	\$	0	
3. CONTRACT SUM TO DATE	\$	0	(1 + 2)
4. TOTAL COMPLETED & STORED TO DATE	\$	0	
5. TOTAL RETAINAGE:	\$	0	(5a+5b)
a. 10% of Completed Work	\$		
b. Stored Material	\$		
6. TOTAL EARNED LESS RETAINAGE	\$	0	(4 - 5)
7. LESS PREVIOUS CERT. FOR PAYMENT	\$	0	
8. CURRENT PAYMENT DUE	\$	0	(6 - 7)
9. BALANCE TO FINISH (INCLUDING RETAINAGE)	\$	0	(3-7-8)

CONTRACTOR'S CERTIFICATION FOR PAYMENT

The undersigned contractor certifies that, to the best of its knowledge, information and belief, the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and Payments received from Owner, and that current payment shown here is now due. Further, Contractor states that as of the date of this application, it has no claims against the Owner, except as may be set forth in an attachment to this Certificate for Payment. Any claims accruing as of the date of this application which are not listed in an attachment hereto are waived.

CONTRACTOR:

By: _____ Date: _____

State of:

County of:

The foregoing Instrument was acknowledged before me this _____ day of _____ by

_____ of _____, a _____

corporation, on behalf of the corporation. He/she is personally known to me or has produced

_____ as identification and did (did not) take an oath.
My Commission Expires: _____

Notary:

CONSULTANT CERTIFICATION FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising the above application, the Consultant certifies to the Owner that to the best of the Consultant's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

CONSULTANT:

By: _____ Date: _____

AMOUNT CERTIFIED: \$

OWNER:

By: _____ Date: _____

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Project Approach - NEGOTIATED C-77

Contractor's Daily Report

PALM BEACH COUNTY									
CONTRACTOR'S DAILY REPORT									
TO: Palm Beach County Project Manager					DATE: _____				
FROM: Contractor Superintendent					PROJECT NAME: _____				
COPY: Design Consultant Project Manager					PROJECT NUMBER: _____				
WORK PERIOD:		WEATHER CONDITIONS:		AM TEMP _____		9 SUNNY		9 CLOUDY	
_____AM TO _____PM				PM TEMP _____		9 SUNNY		9 CLOUDY	
						9 RAIN		9 WINDY	
						9 RAIN		9 WINDY	
EXTRA WORK (TIME/MATERIAL)*		YES NO		MATERIALS DELIVERED		YES NO			
WORK DELAYS*		9 9		MAJOR EQUIPMENT ARRIVED		9 9			
TESTS COMPLETED		9 9		MAJOR EQUIPMENT DEPARTED		9 9			
				INSPECTIONS		9 9			
EXPLAIN ALL "YES" ANSWERS BELOW									

CONTRACTOR/SUB	QTY-WORKERS	WORK PERFORMED TODAY
TOTAL		

DIFFICULTIES & COMMENTS: _____ _____ _____ _____ _____ _____ _____	Add additional sheets as necessary.
--	-------------------------------------

Deficiency Report (DR)

[illegible]

Field Bulletin (FB)

PALM BEACH COUNTY						
FIELD BULLETIN (FB)						
TO: ATTENTION: REFERENCE:	FB NUMBER: _____ DATE: _____ PROJECT NAME: _____ PROJECT NUMBER: _____ CONTRACT NUMBER: _____					
<p>THIS BULLETIN IS NOT A CHANGE IN THE ABOVE CONTRACT NOR AN AUTHORIZATION TO THE CONTRACTOR TO PERFORM WORK, OTHER THAN CONTRACT WORK, OR TO STOP OR SUSPEND WORK UNLESS SPECIFICALLY AUTHORIZED BY THIS BULLETIN. However, it covers certain PROPOSED MODIFICATIONS to the work covered by said contract.</p> <p>CAUSE:</p> <p>DESCRIPTION:</p> <p>NOTE: The Contractor shall submit, within 21 days of receipt of this Bulletin, a CONSTRUCTION CHANGE PROPOSAL # _____, in detailed form, for the above referenced project.</p>						
ORIGINATOR: <table style="width: 100%; border: none;"> <tr> <td style="width: 33%; text-align: center; border-bottom: 1px solid black;">FIRM</td> <td style="width: 33%; text-align: center; border-bottom: 1px solid black;">SIGNATURE</td> <td style="width: 33%; text-align: center; border-bottom: 1px solid black;">DATE</td> </tr> </table>			FIRM	SIGNATURE	DATE	
FIRM	SIGNATURE	DATE				
REMARKS: _____ _____ _____						
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> DISTRIBUTION: Owner's Project Manager Owner's Field Representative </td> <td style="width: 50%; vertical-align: top;"> <table style="width: 100%; border: none;"> <tr> <td style="width: 60%; text-align: center; border-bottom: 1px solid black;">DESIGN PROFESSIONAL</td> <td style="width: 40%; text-align: center; border-bottom: 1px solid black;">DATE</td> </tr> </table> </td> </tr> </table>			DISTRIBUTION: Owner's Project Manager Owner's Field Representative	<table style="width: 100%; border: none;"> <tr> <td style="width: 60%; text-align: center; border-bottom: 1px solid black;">DESIGN PROFESSIONAL</td> <td style="width: 40%; text-align: center; border-bottom: 1px solid black;">DATE</td> </tr> </table>	DESIGN PROFESSIONAL	DATE
DISTRIBUTION: Owner's Project Manager Owner's Field Representative	<table style="width: 100%; border: none;"> <tr> <td style="width: 60%; text-align: center; border-bottom: 1px solid black;">DESIGN PROFESSIONAL</td> <td style="width: 40%; text-align: center; border-bottom: 1px solid black;">DATE</td> </tr> </table>	DESIGN PROFESSIONAL	DATE			
DESIGN PROFESSIONAL	DATE					



Field Instructions (FI)

PALM BEACH COUNTY					
FIELD INSTRUCTIONS (FI)					
TO:	FI NUMBER:				
	DATE:				
ATTENTION:	PROJECT NAME:				
	PROJECT NUMBER:				
REFERENCE:	CONTRACT NUMBER:				
<p>This field instruction is interpreted to be within the scope of the referenced contract and as such is not an authorization for additional work or time.</p>					
REASON FOR INSTRUCTIONS		<input type="checkbox"/> Response to RFI # _____ <input type="checkbox"/> Field Observation <input type="checkbox"/> Other _____			
INSTRUCTIONS: 					
DESIGN PROFESSIONAL		SIGNED:			DATE:
CONTRACTOR ACKNOWLEDGMENT		SIGNED:			DATE:
DISTRIBUTION:	Owner's Project Manager Owner's Field Representative				

Field Observation Report

Field Observation Report

Facilities Development & Operations Department – Capital Improvements Division

Project Name/#:

Report #:

Contractor:

Consultant:

Date:

Time In:

Time Out:

Weather:

Any Weather Delays to Critical Path?

Personnel on Job:

SBE Contractors on Job:

Also note non-SBEs doing work assigned to SBE per Schedule 1

Work Observed:

Areas Available for Work, but no Activity:

Materials Delivered:

Items Discussed:

Remarks:

Attach additional sheets, if necessary

Signed By: _____

Project Manager: _____ Date: _____

File: Project # _____



Non-Conformance Report (NCR)

PALM BEACH COUNTY	
NON-CONFORMANCE REPORT (NCR)	
TO:	NCR NUMBER: _____
	DATE: _____
ATTENTION:	PROJECT NAME: _____
REFERENCE:	CONTRACT NUMBER: _____
<p>DEFICIENCY REPORT #_____ dated ____ / ____ / ____ has not been corrected. Unless corrective work is commenced within three (3) working days, the Owner may exercise the option in GC 62 "Inspection: Rejection of Materials and Workmanship" to withhold payment sufficient to correct the deficiency.</p> <p>DESCRIPTION OF WORK:</p> 	
DESIGN PROFESSIONAL	SIGNED: _____ DATE: _____
CONTRACTOR ACKNOWLEDGMENT	SIGNED: _____ DATE: _____
DISTRIBUTION: Owner's Project Manager Owner's Field Representative	

Request for Information (RFI)

PALM BEACH COUNTY	
PROJECT: _____	
REQUEST FOR INFORMATION (RFI)	RFI # _____
TO: _____	PROJECT NUMBER: _____
ATTENTION: _____	DATE: _____
FROM: _____	CONTRACT NUMBER: _____
SUBJECT: _____	
DRAWING LOCATION: _____	SPECIFICATION SECTION: _____
INFORMATION REQUIRED:	
ORIGINATOR: _____	DATE: _____
RECEIVED BY: _____	DATE: _____
REPLY REQUESTED FROM:	
REPLY: 9 DP 9 OPR 9 OTHER _____	
DISTRIBUTION:	SIGNED BY: _____
	DATE: _____

OSBA Schedule 3 (SBE-M/WBE Activity Form)

OSBA SCHEDULE 3 SBE-M/WBE ACTIVITY FORM

SBE-M/WBE ACTIVITY FOR MONTH ENDING _____ PROJECT#: _____

PROJECT NAME _____

PRIME CONTRACTOR NAME _____

PROJECT SUPERVISOR _____

Schedule 3 is used to show the monthly payment activity for work performed by each SBE-M/WBE Subcontractor on the project and in conformity with the SBE-M/WBE's submitted on schedule 2. It also shows approved change orders as they impact the SBE-M/WBE Subcontractors. Schedule 3 is to be submitted by the Prime with each payment request to Palm Beach County. In the SBE-M/WBE Subcontracting Information section, list the name(s) of each SBE-M/WBE Subcontractor on the project and the total contracted amount for each SBE-M/WBE Subcontractor on the project. As the project proceeds, please complete each column under the SBE-M/WBE Subcontracting Information section accordingly. In the SBE-M/WBE Category, please check the appropriate category that represents each SBE-M/WBE Subcontractor.

SBE-M/WBE SUBCONTRACTING INFORMATION								SBE-M/WBE Category (check all applicable)						
Name of SBE-M/WBE Subcontractor	SBE-M/WBE Total Contract Amount	Approved Change Orders	Revised SBE-M/WBE Contract Amount	Amount drawn for SBE-M/WBE Sub This Period	Amount drawn for SBE-M/WBE Sub to Date	Amount Paid to Date for SBE-M/WBE Subcontractor	Actual Starting Date	Minority Business (✓)	Small Business (✓)	Black	Hispanic	Women	Caucasian	Other (Please Specify)

I hereby certify that the above information is true to the best of my knowledge _____

(Signature and Title)

Return to: Palm Beach County

Additional Sheets May Be Used As Necessary

NOTE: Firms may be certified as an SBE and/or an M/WBE. If firms are certified as both an SBE and M/WBE, the dollar amount will not be counted twice.

Revised 9/7/2011

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Project Approach - NEGOTIATED C-85

Field Observation Report

Field Observation Report

Facilities Development & Operations Department – Capital Improvements Division

Project Name/#:

Report #:

Contractor:

Consultant:

Date:

Time In:

Time Out:

Weather:

Any Weather Delays to Critical Path?

Personnel on Job:

SBE Contractors on Job:

Also note non-SBEs doing work assigned to SBE per Schedule 1

Work Observed:

Areas Available for Work, but no Activity:

Materials Delivered:

Items Discussed:

Remarks:

Attach additional sheets, if necessary

Signed By: _____

Project Manager: _____ Date: _____

File: Project # _____



Submittal Transmittal

PALM BEACH COUNTY																					
SUBMITTAL TRANSMITTAL																					
PROJECT NAME: _____ PROJECT NUMBER: _____ CONTRACT NUMBER: _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th colspan="4" style="text-align: center; font-size: small;">VIA</th> </tr> <tr> <th style="text-align: right; font-size: x-small;">DATE</th> <th style="text-align: center; font-size: x-small;">HAND</th> <th style="text-align: center; font-size: x-small;">MAIL</th> <th style="text-align: center; font-size: x-small;">EXPRESS</th> </tr> </thead> <tbody> <tr> <td style="font-size: x-small;">FORWARDED TO DP</td> <td style="height: 20px;"></td> <td style="height: 20px;"></td> <td style="height: 20px;"></td> </tr> <tr> <td style="font-size: x-small;">FORWARDED TO GC</td> <td style="height: 20px;"></td> <td style="height: 20px;"></td> <td style="height: 20px;"></td> </tr> </tbody> </table>					VIA				DATE	HAND	MAIL	EXPRESS	FORWARDED TO DP				FORWARDED TO GC			
	VIA																				
DATE	HAND	MAIL	EXPRESS																		
FORWARDED TO DP																					
FORWARDED TO GC																					
<table style="width: 100%;"> <tr> <td style="width: 50%;">FROM: _____</td> <td style="width: 50%;">SIGNED: _____</td> </tr> <tr> <td style="text-align: center; font-size: x-small;">CONTRACTOR</td> <td style="text-align: center; font-size: x-small;">CONTRACTOR</td> </tr> <tr> <td>TO: _____</td> <td>RECEIVED BY: _____</td> </tr> <tr> <td style="text-align: center; font-size: x-small;">DESIGN PROFESSIONAL</td> <td></td> </tr> </table>					FROM: _____	SIGNED: _____	CONTRACTOR	CONTRACTOR	TO: _____	RECEIVED BY: _____	DESIGN PROFESSIONAL										
FROM: _____	SIGNED: _____																				
CONTRACTOR	CONTRACTOR																				
TO: _____	RECEIVED BY: _____																				
DESIGN PROFESSIONAL																					
SPECIFICATION SECTION	SUBMITTAL NO.	DESCRIPTION	SUBMITTAL TYPE	APPROVAL STATUS																	
REMARKS: _____ _____ _____ _____ _____																					
COMMENTS: _____ _____ _____ _____ _____																					
PROCESSED BY: _____ <div style="display: flex; justify-content: space-between; font-size: x-small;"> DESIGN PROFESSIONAL DATE </div>																					
APPROVAL STATUS CODE <div style="display: flex; justify-content: space-between; font-size: x-small;"> <div> 1. NO EXCEPTION TAKEN 2. MAKE CORRECTIONS NOTED 3. MAKE CORRECTS NOTED RESUBMIT </div> <div> 4. REJECTED 5. NOT REQUIRED FOR REVIEW </div> </div>																					

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Project Approach - NEGOTIATED C-87

Substitution Request Form

PALM BEACH COUNTY - CAPITAL IMPROVEMENTS DIVISION SUBSTITUTION REQUEST FORM

TO: _____ Date: _____
Consultant

RE: Palm Beach County

Project: _____ Project No.: _____

We hereby submit for your consideration the following product as a substitution to the specified item for the above project.

Specification Section: _____ Paragraph: _____

Specified Item: _____ Specified Manuf.: _____

Drawing No.: _____ Drawing Title: _____

Location of Product Use: _____

1. Does the substitution affect dimensions shown on Drawings? Yes ___ No ___
If yes, attach drawings with affected changes clearly marked.
2. Will the change have an effect on other disciplines: Yes ___ No ___
If yes, explain: _____

3. What effect does substitution have on schedule? _____
4. Will the Contractor be offering a credit for the proposed substitution? If yes, how much? Yes _____ \$ _____ No _____
5. Reason for substitution: _____

6. Is the substitution equal to or better than the specified product in all aspects?
Yes _____ No _____



- 7a. If the acceptance of the substitution requires a revision or redesign of any part of the Work, will the Contractor be providing the redesign?
Yes _____ No _____ N/A _____
- 7b. If the acceptance of the substitution requires a revision of any part of the Work by the County's Design Professional, will the Contractor pay the County's Design Professional to do the redesign?
Yes _____ No _____ N/A _____
8. List significant variations of proposed substitution with specified product:

Attach complete technical data including descriptive literature and performance data. Submit sample of material where feasible. Include complete information on changes to Drawings. Without this information, request will be returned unreviewed.

CERTIFICATION

The undersigned does hereby certify that the proposed substitution is equal to or superior to the specified item in function, performance, design, appearance, and quality, and is compatible with interfacing materials.

Submitted by:

Contractor	Sub-Contractor
------------	----------------

For Use by Consultant:

() Accepted () Not Accepted () Accepted a Noted () Resubmit

Consultant	Signature	Date
------------	-----------	------

Remarks:

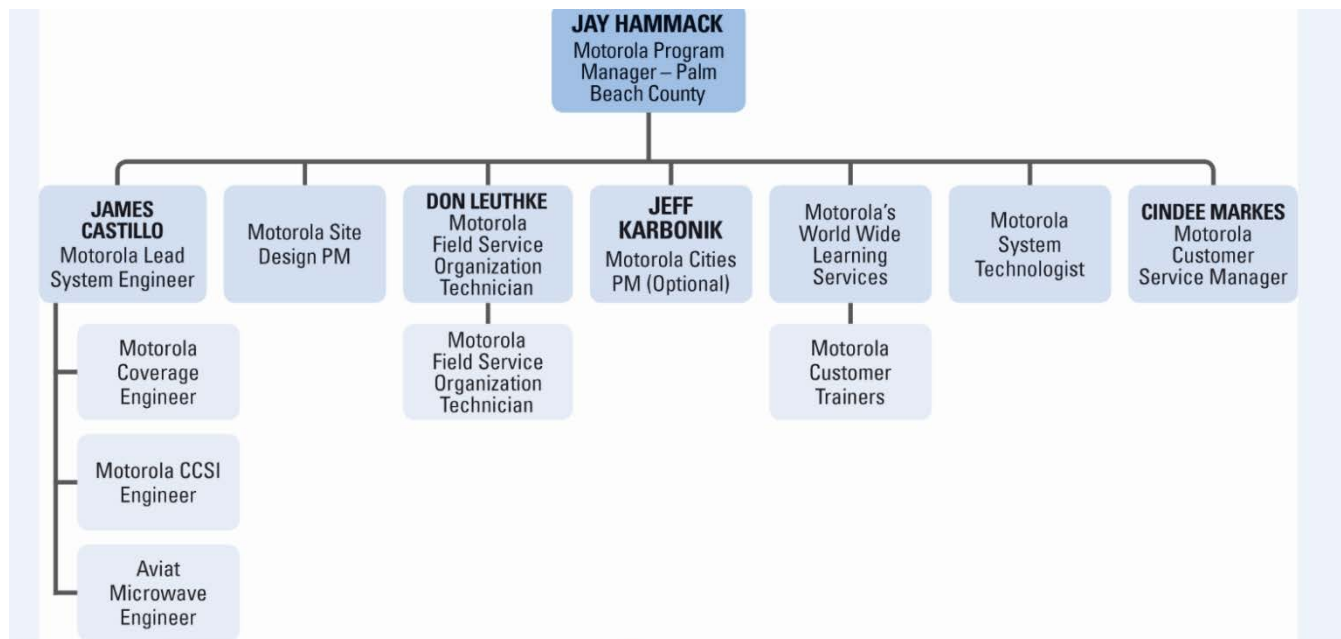
Accepted by PBC Project Manager

Signature	Date
-----------	------



7.2 Project Team Organizational Structure

Provided below.



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Project Approach - NEGOTIATED C-90

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7.3 Project Manager Resume and References

7.3.1 Project Manager, Jay Hammack

Project Manager	Jay Hammack
Year of Hire	August 31, 1987
Motorola Professional Experience	<p>06/2000 to Present</p> <p>Project Manager</p> <p>Project Manager responsible for large System Integration projects. Projects have met cost and schedule goals and received positive feedback from customers at completion. Customers include:</p> <p>Citrus County, FL (2015) P25 System (7.15); 6 simulcast sites, 7 channels; SmartX in 5 channels of an existing 6 site analog simulcast system; replacement of a Microwave hop; 12-MCC 7500 consoles; IP and telephony loggers.</p> <p>Osceola County, FL (2015) P25 System (7.14); 9 simulcast sites, 10 channel expansion; 3 channel ASTRO Site Repeater (ASR) site for aviation units; 32 MCC 7500 consoles at 3 dispatch centers; replacement of 15 UPS units, replacement of the Microwave System and Tower remediation at 4 sites.</p> <p>Nassau County, FL (2015) P25 System upgrade, 7.11 to 7.14 TDMA add on, with 250 APX 6000 portable and 300 APX 6500 mobile radios.</p> <p>Florence County, SC (2014) P25 System (7.14); 6 simulcast sites, 11 channel; 2 of the sites were new construction; replacement of the Microwave system; 12-MCC 7500 & 2-MCC 7100 consoles with an IP logger; 1000 APX 6000 portable and 500 APX 6500 mobile radios.</p> <p>Jacksonville Transit Authority, FL (2014) Point to Point (PTP) Microwave Link into First Coast Radios P25 System (FCRS); 5-MCC 7500 Consoles; 5 Consolettes and 300 APX 4500s integrated with the Clever Devices CAD System.</p> <p>Orange County, FL (2013) 54 MCC 7500 Consoles at 9 dispatch sites.</p> <p>City of Lakeland, FL 2013 Richard Hesse (863) 834-6894 P25 TDMA System (7.13); 3 site simulcast, 11 channel, 1 back up site, 11 channel; 9-MCC 7500 Consoles at 2 sites; IP and telephony loggers; 1100 APX 6000 portable and 700 APX 6500 mobile radios; VHF Paging, P25 SCADA System.</p> <p>Osceola County, FL (2013) Bruce Bonner (407) 742-5916 P25 System (7.11); 9 simulcast sites, 10 channel, utilizing an MGE and SmartX. Microwave expansion and fire station alerting.</p> <p>Orange County, FL (2013) Rich Steiner (407) 836-2810 P25 System (7.9); 12 simulcast sites, 28 channel, 4 ASR sites utilizing an MGE and SmartX. 24 story Distributed Antenna System (DAS).</p>

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Project Approach - NEGOTIATED C-91

Project Manager	Jay Hammack
	<p>Polk County, FL (2012) Ben Holycross (863) 519-7381 P25 System (7.7); 12 simulcast sites, 13 channel; including 18 MCC 7500 consoles, site development, microwave and PTP deployment.</p> <p>Lake County, FL (2008/09) Greg Holcomb (352) 343-9458 P25 System (7.6); 18 simulcast sites, 12 channel; including 20 MCC 7500 consoles.</p> <p>Sarasota County, FL (2007) AVL implementation w/ PMDC.</p> <p>Sarasota County, FL (2006) 4 Channel expansion, 1 simulcast site addition.</p> <p>City of Hollywood, FL (2004) Dispatch Center, upgraded electrical distribution, implemented 7 Gold Elite consoles and 21 CAD consoles, fleetmapping and subscriber programming programming/installation.</p> <p>City of Fort Lauderdale, FL (2004) Implemented 21 Gold Elite Consoles, SmartZone 3.0 Integration, fleetmapping and subscriber programming.</p> <p>Broward County, FL Sheriff's Office (2000)-2005 5 Channel expansion, 2 simulcast site addition, SmartZone 3.0 System implementation, AVL implementation w/ PMDC, CAD upgrade, Air Mobile implementation, UPS upgrade, BDA implementation (FTL Airport).</p>
Military Experience:	<p><i>10/99 to 10/00 (retired)</i></p> <p>US Navy Reserve, Southern Command Construction Quality Assurance Officer, Honduras Quality Assurance Liaison Officer between Southern Command, in country military personnel and Honduran government officials on all humanitarian relief construction projects.</p>
	<p><i>10/97 to 10/99</i></p> <p>US Navy Reserve Naval Mobile Construction Battalion 14 Company Commander, lead a group of over 100 men in supporting the Battalion's mission; including project management of construction and restoration projects. Additional responsibility included serving as the Air Detachment Commander.</p>
Education	<p>B.S. Electrical Engineering, Florida Atlantic University 1986 Masters Certificate in Project Management, George Washington University 2002 Project Management Professional (PMP) Certification, Project Management Institute (PMI) 2014</p>
Training, Certifications, and Memberships	<p><i>Motorola Training:</i> Scheduling and Cost Control, Risk Management, Project Leadership, Contracting, Project Quality, Rapid Assessment, Managing Complex Projects and Managing Global Projects</p>



Jay Hammack References	
Project:	Lake County, FL
Role:	Project Manager
Name and title of reference:	Greg Holcomb
Address:	
City, State, Zip Code:	
Contact Telephone Number:	(352) 343-9458
E-mail:	GHolcomb@lakecountyfl.gov
Brief description of work performed	P25 System (7.6); 18 simulcast sites, 12 channel; including 20 MCC 7500 consoles.
Project:	Orange County
Role:	Project Manager
Name and title of reference:	Rich Steiner
Address:	
City, State, Zip Code:	
Contact Telephone Number:	(407) 836-2810
E-mail:	Richard.Steiner@ocfl.net
Brief description of work performed	P25 System (7.9); 12 simulcast sites, 28 channel, 4 ASR sites utilizing an MGEG and SmartX. 24 story Distributed Antenna System (DAS).
Project:	Polk County
Role:	Project Manager
Name and title of reference:	Ben Holycross
Address:	
City, State, Zip Code:	
Contact Telephone Number:	(863) 519-7381
E-mail:	benholycross@polkfl.com
Brief description of work performed	P25 System (7.7); 12 simulcast sites, 13 channel; including 18 MCC 7500 consoles, site development, microwave and PTP deployment.
Project:	Osceola County
Role:	Project Manager
Name and title of reference:	Bruce Bonner
Address:	
City, State, Zip Code:	
Contact Telephone Number:	(407) 742-5916

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Project Approach - NEGOTIATED C-93

Jay Hammack References	
E-mail:	bbon@OSCEOLA.ORG
Brief description of work performed	P25 System (7.11); 9 simulcast sites, 10 channel, utilizing an MGE and SmartX. Microwave expansion and fire station alerting.
Project:	Citrus County
Role:	Project Manager
Name and title of reference:	Dennis Devoe
Address:	
City, State, Zip Code:	
Contact Telephone Number:	(352) 422-4394
E-mail:	DDevoe@sheriffcitrus.org
Brief description of work performed	P25 System (7.15); 6 simulcast sites, 7 channels; SmartX in 5 channels of an existing 6 site analog simulcast system; replacement of a Microwave hop; 12-MCC 7500 consoles; IP and telephony loggers.

7.4 Project Team Resumes and References

Motorola has provided resumes and references for our Palm Beach County project team members on the following pages.

7.4.1 Project Engineer – James Castillo

Motorola Systems Engineer	James Castillo
Year of Hire	1987
Motorola Professional Experience	Motorola Systems Lead Project Engineer <ul style="list-style-type: none"> Responsible for the system design and providing technical expertise for the project that includes the system architecture and radio system coverage design. Interface to the Factory Product Design Engineers to insure the system components meet the system specifications and the application. Provide system design documentation to the Systems Factory – Customer Center for Systems Integration (CCSi) for the system build. Interface with customers and consultants to provide explanation to the system design and lead the acceptance testing of the system. Provide system design documentation at the completion of a project.



Motorola Systems Engineer	James Castillo
	Lead Project Engineer – Osceola County, FL - ASTRO 25 System Upgrade System design and implementation of an 800 MHz P25 system upgrade from a 800 MHz Smartnet system. <ul style="list-style-type: none"> 9-Site by 12-channel ASTRO 25 simulcast trunked system. 9-site by 8-channels Analog with SmartX system. 8 Path MNI Proteus Microwave System. 31 new IP dispatch consoles. ~6,000 radio subscribers. Started 12/88/14; to be finished June 2015.
	Lead Project Engineer – Seminole County, FL - ASTRO 25 System Upgrade System design and implementation of an 800 MHz P25 system upgrade from an 800 MHz SmartNet system. <ul style="list-style-type: none"> 9-Site by 20-channel ASTRO 25 simulcast trunked system. 9 Path MNI Proteus Microwave System. 54 new IP dispatch consoles. ~3,000 radio subscribers. Completed December 2014.
	Lead Project Engineer – Sumter County, FL - ASTRO 25 System Upgrade System design and implementation of an 800 MHz P25 system upgrade from a VHF conventional system. <ul style="list-style-type: none"> 6-Site by 9-channel ASTRO 25 simulcast trunked system. 8 Path MNI Proteus Microwave System. 15 new IP dispatch consoles. ~3,000 radio subscribers. Completed December 2012.
	Lead Project Engineer – City of Ocala, FL - ASTRO 25 System Upgrade System design and implementation of an 800 MHz P25 system upgrade from an 800 MHz SmartNet system. <ul style="list-style-type: none"> Single Site by 10-channel ASTRO 25 trunked system. 9 new IP dispatch consoles. ~2,000 radio subscribers. Completed October 2011.
	Lead Project Engineer – Marion County, FL - ASTRO 25 System Upgrade System design and implementation of an 800 MHz P25 system upgrade from a 2-Site Simulcast ASTRO 25 system. <ul style="list-style-type: none"> 7-site by 12-channel ASTRO 25 simulcast trunked system. 1 site standalone ASTRO Site Repeater. ~3,000 radio subscribers. Completed April 2011.



Motorola Systems Engineer	James Castillo
	Lead Project Engineer – Marion County, FL - ASTRO 25 System Upgrade System design and implementation of an 800 MHz P25 system upgrade from a VHF system. <ul style="list-style-type: none"> 2-site by 6-channel ASTRO 25 simulcast trunked system. 3-site standalone ASTRO Site Repeater. 16 new IP dispatch consoles. ~3,000 radio subscribers. Completed April 2009.
	Lead Project Engineer – Reedy Creek, FL - ASTRO 25 System Simulcast Trunked System System design and implementation of an 800 MHz P25 system Simulcast Trunked System <ul style="list-style-type: none"> 3-site by 6-channel ASTRO 25 simulcast trunked system. 9 new IP dispatch consoles. ~300 radio subscribers. Completed April 2011.
	Lead Project Engineer – Lake County, FL - ASTRO 25 System Upgrade System design and implementation of an 800 MHz P25 system upgrade from a VHF system. <ul style="list-style-type: none"> 18-site by 12-channel ASTRO 25 simulcast trunked system. 21 new IP dispatch consoles. ~5,000 radio subscribers. Completed April 2009.
	Lead Project Engineer – Martin County, FL SmartZone 4.1 Mixed-Mode ASTRO Simulcast Trunked System System design and implementation of an 800 MHz SmartZone 4.1 Mixed-Mode Analog/Digital Trunked Simulcast System. <ul style="list-style-type: none"> 4-site by 12-channel Analog/Digital simulcast trunked system. 16 Gold Elite dispatch consoles. ~10,000 radio subscribers. Completed 2002.
	Motorola Inc., Orlando, Florida <i>January 1994 to January 1998</i> Lead Project Engineer – Irrinet and Scorpio Design and Implementation, Eastern United and South America, System design and implementation of an 800 MHz Irrigation System Controllers and Fertilization Injection. Engineered and implemented well over 30 irrigation systems over the Eastern United States and South America.



Motorola Systems Engineer	James Castillo
	Motorola Inc., New York, New York <i>February 1990 to December 1993</i> Field Technical Supervisor. Managed Field Technical Representatives and provided technical expertise for trouble shooting system issues and making recommendations for corrective action.
	Motorola Inc., New York, New York <i>August 1987 to January 1990</i> Field Technical Representative Provided technical expertise for trouble shooting system issues and making recommendations for corrective action.
Education	April 2003 Columbia State University, Louisiana Bachelors of Science Degree Two years of Electronics and Communications systems training while serving in the U.S. Marines Product and Systems Training – Motorola University courses
Certifications	COMP TIA Network + COMPTIA Security + Motorola ASTRO 25 Subject Matter Expert

	James Castillo References
Your name:	James Castillo
Project:	Osceola County
Your role:	Lead Engineer
Name and title of reference:	Bruce Bonner / System Manager
Address:	
City, State, Zip Code:	
Contact Telephone Number:	(O) 407-343-7756 (M) 407 421 9494
E-mail:	bbon@osceola.org
Brief description of work performed	Migrate a Smartnet System to an ASTRO 25 Simulcast and SmartX design
Your name:	James Castillo
Project:	Seminole County
Your role:	Lead Engineer
Name and title of reference:	Tommy Oliveras / Telecommunications Manager
Address:	180 Bush Blvd
City, State, Zip Code:	Sanford, Florida 32771



	James Castillo References
Contact Telephone Number:	(O) 407-665-1039 (M)
E-mail:	toliveras@seminolecountyfl.gov
Brief description of work performed	Migrate a Smartnet System to an ASTRO 25 Simulcast and SmartX design
Your name:	James Castillo
Project:	Sumter County
Your role:	Lead Engineer
Name and title of reference:	Stephen J. Kennedy, M.P.A / Deputy Chief - Administration
Address:	7375 Powell Rd, Suite 129
City, State, Zip Code:	Wildwood, FL 34785
Contact Telephone Number:	(O) 352-689-4500 (M) 352-444-5740
E-mail:	Stephen.Kennedy@sumtercountyfl.gov
Brief description of work performed	Migrate from a conventional VHF system to a 6 site 9 channel ASTRO 25 system.

7.4.2 Field Service Organization Manager – Don Leuthke

South Florida FSO Manager	Don Leuthke
Date of Hire	1984
Summary	Motivated self-starter with experience in managing resources and business. Capable of maintaining strong internal and external relationships in order to problem solve and meet customer deliverables while adding value and making a positive impact within the organization.
Motorola Professional Experience	South Florida Field Service Organization Manager Manage South Florida FSO in four county regions. Manage financial forecast, work closely with internal teams, and build relationships with service partners to ensure seamless service product delivery.
	State of Florida Project Liaison Manager Provided interface between users and Motorola on Public Safety systems. Conducted regular user meetings and reports on system performance details.
	Computer Group Service Technician Conducted on-site troubleshooting for Motorola Computer Group; maintained large commercial customers.
	Field Server Technician Serviced and maintained infrastructure radio systems for Public Safety customers in South Florida.



South Florida FSO Manager	Don Leuthke
	Subscriber Template Developer/Programmer Developed and managed template development for subscribers during build-out of new systems.
	Installation Supervisor Scheduled and managed install department for Palm Beach County Motorola shop.
	Subscriber Bench Technician Repaired mobile and portable radios in Palm Beach County Motorola radio shop.
Education	November 1986 Associate of Science in Electronics Engineering Technology June 2006 Associate's Certificate in Project Management
Skills	Dependable, proven multi-tasking capabilities, adaptable to highly stressful environment, ability to exercise sound independent judgment.
Awards & Honors	<ul style="list-style-type: none"> ▪ Overachievers Award 2003 ▪ Overachievers Award 2002 ▪ Overachievers Award 1999 ▪ Certificate of Appreciation from Florida Highway Patrol 1998 ▪ Worldwide Employee Recognition Award 1998 ▪ Worldwide Employee Recognition Award 1997 ▪ Certificate of Excellence 1993
	References available upon request.

	Don Leuthke References
Your name:	Don Leuthke
Project:	Martin County Radio System
Your role:	FSO Manager
Name and title of reference:	Richard Jenkins / Radio System Manager
Address:	6000 SE Tower Dr
City, State, Zip Code:	Stuart, FL 34997
Contact Telephone Number:	(O) 772-463-3257 (M) 772-260-2679
E-mail:	rjenkins@martin.fl.us
Brief description of work performed	Field Service Organization manager ensuring service deliverables are met. Manage Motorola staff that provides support to County.
Your name:	Don Leuthke
Project:	Palm Beach County P25 Master Site

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Project Approach - NEGOTIATED C-99

	Don Leuthke References
Your role:	FSO Manager
Name and title of reference:	Mark Filla / Radio System Manager
Address:	2601 Vista Parkway
City, State, Zip Code:	West Palm Beach, FL 33411
Contact Telephone Number:	(O) 561-233-0837 (M) 954-650-2560
E-mail:	mfilla@pbcgov.org
Brief description of work performed	Field Service Organization manager ensuring service deliverables are met. Manage Motorola staff that provides support to County.
Your name:	Don Leuthke
Project:	Fort Lauderdale, City of
Your role:	FSO Manager
Name and title of reference:	Troy Bailey / Communications Manager
Address:	1301 SW 2nd Court
City, State, Zip Code:	Fort Lauderdale, Florida
Contact Telephone Number:	(O) 954-828-5790 (M) 954-593-6106
E-mail:	tbailey@fortlauderdale.gov
Brief description of work performed	Field Service Organization manager ensuring service deliverables are met. Manage Motorola staff that provides support to City.

7.4.3 Customer Support Manager – Cindee Markes

Customer Support Manager	Cindee Markes
Date of Hire	May 1987
Motorola Professional Experience	<p>2002 to Present</p> <p>Customer Support Manager- South Florida</p> <ul style="list-style-type: none"> Responsible for managing all service contracts working directly with End Users to ensure the highest level of support for Public Safety accounts within a 6 county area in South Florida. Liaison for Public Safety customers to ensure timely resolution of service issues. Responsible for managing the relationships with Motorola Service Partners and Third-Party vendors to ensure contractual deliverables to Public Safety accounts. Oversee implementation of system upgrades. Managing small project implementations with customers and

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Project Approach - NEGOTIATED C-100

Customer Support Manager	Cindee Markes
	<p>service partners.</p> <ul style="list-style-type: none"> Work with Project Managers during system implementations to ensure a smooth transition into warranty upon cutover.
	<p>1999 to 2002</p> <p>Motorola Service Office Manager- South Florida</p> <ul style="list-style-type: none"> Office Manager for State of Florida system. Managed P&L and Accounts Payables for FSO Organization. Worked directly with customers and internal organizations towards resolution of service issues. Worked with CSM and Public Safety customers to ensure deliverables for maintenance agreements.
	<p>1987 to 1999</p> <p>Motorola COSC Office Manager- Indianapolis, IN</p> <ul style="list-style-type: none"> Managed all accounts receivables/ payables for 2 Motorola Service Shops, as well as the P&Ls. Addressed customer issues and concerns to resolution. Responsible for national service agreement with Simon Properties to ensure timely service deliverables and uptime for communications at over 200 locations throughout the country. Responsible for statewide service agreement with Indiana Gas to ensure timely service deliverables and uptime for radio communications at over 50 locations throughout the state.
Training, Certifications, and Memberships	<p>Motorola Quality White Badge- 2008</p> <p>Certified Customer Service Specialist – 2007</p> <p>Basic Radio Communications- 2015</p> <p>Introduction to R56 Standards- 2015</p> <p>Overachievers Award 1993</p> <p>Overachievers Award 1994</p> <p>Overachievers Award 1996</p> <p>Motorola's First Success Science Award 1997</p> <p>Overachievers Award 2000</p>

	Cindee Markes References
Your name:	Cindee Markes
Project:	Miami Dade Fire Rescue
Your role:	CSM
Name and title of reference:	Chief Greg Rubin
Address:	9300 NW 41st Street
City, State, Zip Code:	Miami, FL 33178
Contact Telephone Number:	(O) 786-336-6702 (M)
E-mail:	grubin@miamidade.gov
Brief description of work performed	CSM for 12 years during implementation/ warranty & maintenance. Large ongoing project

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Project Approach - NEGOTIATED C-101

	Cindee Markes References
Your name:	Cindee Markes
Project:	Palm Beach County P25 Master Site
Your role:	CSM
Name and title of reference:	Mark Filla / Radio System Manager
Address:	2601 Vista Parkway
City, State, Zip Code:	West Palm Beach, FL 33411
Contact Telephone Number:	(O) 561-233-0837 (M) 954-650-2560
E-mail:	mfilla@pbcgov.org
Brief description of work performed	CSM, ensured warranty issues addressed, assisted for cut over and provided support during warranty and now maintenance. On this account for 12 years.
Your name:	Cindee Markes
Project:	Hialeah, City of
Your role:	CSM
Name and title of reference:	Anthony Arce / Radio System Manager
Address:	83 E 5th Street Room 239
City, State, Zip Code:	Hialeah, FL 33010
Contact Telephone Number:	(O) 305-883-5821 (M) 305-205-3842
E-mail:	aarce@hialeahfl.gov
Brief description of work performed	CSM, ensured warranty issues addressed, assisted for cut over and provided support during warranty and now maintenance. On this account for 12 years.
Your name:	Cindee Markes
Project:	Boynton Beach MCC 7500 Console Project
Your role:	CSM
Name and title of reference:	Doug Solomon / Technical Service Manager
Address:	100 East Boynton Beach Blvd
City, State, Zip Code:	Boynton Beach, FL 33435
Contact Telephone Number:	(O) 561-742-6171 (M)
E-mail:	solomond@bbfl.us
Brief description of work performed	CSM, ensured warranty issues addressed, assisted for cut over and provided support during warranty and now maintenance. On this account for 12 years.



7.5 Subcontractors

Motorola Solutions will be teaming with Aviat Networks for the deployment of our proposed Microwave Solution.

7.5.1 Aviat Networks

The Leading Microwave Networking Specialist

Smarter Microwave Networking Solutions

Thanks to our 50 years of industry experience, Aviat Networks knows microwave transmission better than anyone, and now we are delivering the next generation of LTE Proven and Mission Critical microwave networking solutions that bring together high performance radio transmission, advanced data networking and smart network evolution to all-IP.

With locations across the world, Aviat works by the side of our customers, offering a wide spectrum of service and support solutions that allows them to quickly seize new market opportunities and deliver the highest quality of experience to their customers.

Constant Innovation

We have a long list of industry firsts, including the first split-mount microwave radio, the first embedded management system, the first 38 GHz 128QAM SDH radio, and the first compact hybrid nodal microwave platform. Now we are working on the next generation of microwave networking, which includes a new range of high capacity, zero-footprint radios that deliver high performance with integrated Carrier Ethernet networking, and the world's first ultra-slim E-Band radio, the first product to incorporate an integrated flat panel antenna.

Financial Strength

Aviat Networks is a specialist microwave company – it's all that we do. Our aim is to provide the most innovative wireless solutions to solve our customers' backhaul challenges at the very lowest total cost of ownership. Profitable, financially stable and secure, Aviat has a strong balance sheet, minimal debt and a healthy cash position.

The Most Trusted Name in Microwave

Aviat has more experience than any other microwave vendor in providing mission critical microwave solutions for applications where lives are on the line. Whether you are a public safety agency with first responder assignments, a mobile service provider with a national footprint, or a utility co-op serving small rural locations, your business has critical applications that your customers depend on.

When you choose Aviat Networks you are assured of robust, secure and powerful microwave radios, offering unrivalled peace of mind where reliability is paramount and service to customers cannot be compromised, even in the most difficult conditions.

But Aviat's Mission Critical Microwave credentials are more than just market-leading radio's performance or superior technical support:

- Our mindset that integrates our uncompromised commitment to design and build the most robust, secure and dependable microwave radios.
- ☐ Our engineering professionals are there at your side before, during and after any equipment deployment, to help you at every step of the way.



☐ It is our focus to deliver the most innovative microwave products for your critical applications.

Strong Service Portfolio

With over 40 locations across the world, Aviat works by the side of our customers, offering a wide spectrum of service and support solutions that allows them to quickly seize new market opportunities and deliver the highest quality of experience to their customers, while also optimizing and reducing their network operational costs.

Our service offering spans the full network lifecycle, including design, deployment, optimization and maintenance. Aviat also provides a suite of Managed Service options, where Aviat can handle everything from spares management to network monitoring, operations and control from our own Network Operations Centers (NOC).

7.5.2 Aviat Territory Manager, Patrick Kahn

Territory Manager – Southeast Region	Patrick Kahn
Date of Hire	July 1984
Aviat Professional Experience	<i>July 2012 to Present</i> Territory Manager – Southeast Region Overall account responsibility in Southeast Region, including proposal generation and accuracy, general design recommendations and assistance to customers and end-users. Work with customers to develop wireless solutions to connectivity problems.
	<i>2004-2012</i> Account Manager <i>2002-2004</i> Sales Engineering <i>1998-2002</i> Operations Management <i>1994-1998</i> Sustaining Engineering <i>1984-1994</i> Factory Test and Integration Technician
Education	Texas A&M Institute of Electronic Science – Graduate Aug. 1984

7.6 Project Implementation Plan/Schedule

7.6.1 Statement of Work

This Statement of Work (SOW) defines the principal activities and responsibilities of all parties for the implementation of the integrated Countywide Communications Systems for Palm Beach County. Deviations and changes to the SOW are subject to mutual agreement between the County and Motorola and will be addressed according to the change provisions of the Contract.

7.6.1.1 System Overview

The following major subsystems are included as components of the Project SOW:

- ☐ 800 MHz P25 Radio System.
- ☐ P25 Aviation Site
- ☐ MCC 7500 Console Subsystem.
- ☐ Microwave Subsystem.
- ☐ Civil Work.

Note: Unless otherwise indicated, the word “system” herein will refer to the compilation of the foregoing subsystems, interfaces, and ancillary systems.

7.6.1.2 System Implementation Overview

The P25 Radio System project schedule provides a phased approach to implementation, with the following phases:

- Project Initiation and Kickoff.
- Customer Design Review (CDR).
- Order Processing, Manufacturing, Fleetmapping, Staging, and Factory Testing of the P25 Radio System.
- Civil Work.
- Fixed Equipment Installation.
- Systems Integration and Optimization.
- Acceptance Testing, including functional test, coverage test, and 30-day reliability test.
- Training.
- Cutover.
- Project Finalization.

7.6.1.3 Description of Work, Schedule, and Responsibilities

The work associated with each of the phases of the SOW is divided into the following tasks: Title, Objective, Task Description, Motorola and County Responsibilities, and Completion Criteria. The scheduled dates of tasks are depicted in the high-level Project Schedule included in Tab 7.6 of this proposal.

7.6.1.4 Project Initiation and Kickoff

The project will be initiated with a Project Kickoff meeting including key County and Motorola project participants. The objectives of the Kickoff meeting are included in Table 7-2.

Table 7-2: Kickoff meeting

Task	Motorola	County	Deliverable
Communication Plan.	X	X	<ul style="list-style-type: none">▪ Exchange contact information▪ Document project personnel▪ Review Roles▪ Lines of Communication▪ ID key work partners and users
Detailed Design Review Planning Session.	X	X	<ul style="list-style-type: none">▪ Review Project Scope▪ Design▪ Implementation



Task	Motorola	County	Deliverable
Review Project Schedule.	X	X	<ul style="list-style-type: none"> Review unique schedule requirements Review Resources
Align expectations on Project Plans.	X	X	<ul style="list-style-type: none"> Risk Management Quality Assurance Communications Plan Detailed Design Action Log and Issue Management

7.6.1.5 Design Review

A preliminary design has been provided as a part of this proposal, which serves as a baseline for the Customer Design Review (CDR). The CDR encompasses the design finalization of the major subsystems, such as finalization of site locations, coverage design, and FCC licensing tasks. The CDR will also include finalization of the Project Plan, which will include schedule and WBS to include all key elements of the implementation with identified parties who will perform the work. As part of the Project Plan and Risk Mitigation Plan, the CDR will include identification of required testing during Factory Staging, Functional Testing, and Coverage Testing. Motorola will work closely with the County to develop a detailed Cutover Plan to transition to the new communications system. At the end of the CDR phase, preliminary Detailed Design Documents will be provided to the County showing how the equipment will be installed, connected, and tested. Additionally, an equipment list of all material will be included along with any product literature and manuals.

Draft and final versions of documents will be provided to the County for review and approval, which will finalize the design review process. The responsibility matrix in Table 7-3 defines the deliverables and responsibilities for both the County and Motorola.

Table 7-3: Design Review

Task	Motorola	County	Deliverable
Coverage Design and Sites	X	X	<ul style="list-style-type: none"> Final Site Selection Coverage Design Coverage maps
Frequency Plan	X		Frequency Plan: <ul style="list-style-type: none"> Microwave frequency plan and design Path Surveys Frequency plan by site
Cutover Plan	X	X	Cutover Plan
Finalize the Project Schedule	X	X	Project Schedule
Design Document Review	X		The Preliminary Design Document will include: <ul style="list-style-type: none"> Equipment list (bill of materials) System drawings and documentation Complete block diagrams of the entire Radio System Floor Plan Drawings and rack layouts Detailed Power and HVAC requirements Antenna design Failure mode/user impact and

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Project Approach - NEGOTIATED C-106

Task	Motorola	County	Deliverable
			recovery ▪ Update the SOW
County will review work performed by Motorola and sign an approval document for: ▪ Design Review. ▪ Project Schedule. ▪ Communications Plan. ▪ Risk Plan. ▪ Quality Plan.		X	Approval Statement of Design and Project Plans

Coverage Design

Motorola and the County will work together to finalize sites for inclusion in the P25 Radio System. Motorola will analyze the coverage and evaluate frequency compatibility to aid the County in finalizing radio sites and radio site configurations.

The responsibility matrix in Table 7-4 defines the deliverables and responsibilities for both the County and Motorola.

Table 7-4: Coverage Design

Task	Motorola	County	Deliverable
Review the coverage and site locations.	X	X	Agreement of site location and configuration
Motorola will incorporate design limitations based on County requirements for FCC licenses.	X		Incorporate licensing input to RF design
Coverage Design Review: ▪ Coverage maps for the RF system that illustrate the predicted coverage. Review all coverage predictions with the County team.	X	X	Finalized coverage maps for the P25 Radio System Modernization

Microwave Subsystem Design

Motorola's design proposal includes adding new components to the County's existing Aviat Digital Microwave Network. The Microwave Subsystem consists of the following components:

Microwave Component

- Point-to-Point Digital Microwave Radios.
- Microwave Antennas.
- Antenna Systems.
- Alarms.

Motorola will work with County to research frequencies, prior to coordination, and preparation of all associated FCC license applications on behalf of the County. Table 7-5 defines the deliverables and responsibilities for both the County and Motorola.

Table 7-5: Microwave Subsystem Design



Task	Motorola	County	Deliverable
Conduct site visits at all sites necessary for the microwave backhaul.	X		Agreed upon remediation plan with the County if required
Motorola will conduct path surveys.	X		Channelization Plan with recommended antenna centerline mounting heights provided to the County
If re-licensing is required, Motorola will prepare all required documents for the county.	X		FCC Licensing request
Submittal of License Request to the FCC.		X	Approved Licenses

Frequency Plan and Intermodulation (IM) Analysis

Motorola and the County will work together to finalize a frequency plan for the P25 Radio System. Motorola will evaluate frequency compatibility based on the frequency assets identified for use within the system based on the desired coverage and loading. These steps will be an iterative process to aid the County in finalizing the system configurations. The responsibility matrix in Table 7-6 defines the deliverables and responsibilities for the County and Motorola.

Table 7-6: Frequency Plan and Intermodulation Analysis

Task	Motorola	County	Deliverable
<ul style="list-style-type: none"> The County will confirm the list of frequencies for use within the P25 Radio System and add the known frequencies at shared tower locations. 		X	Agreement on the frequency list
If required, Licenses will be modified by Motorola.	X	X	Amended Licenses
Design compatibility of identified frequencies within the simulcast cells.	X		Evaluation of Frequency Compatibility with Sites
Motorola will recommend a frequency plan.	X		Frequency plan for the P25 Radio System that uses available channels to meet the coverage and loading requirements
Research and prepare FCC forms and submittals needed for existing and/or new sites or channels.	X		Provide to County for signature and submittal
<ul style="list-style-type: none"> As mandated by FCC, County, as the licensee, has the ultimate responsibility for providing all required radio licensing or licensing modifications for the system prior to system staging. Motorola will research and prepare 	X	X	700 / 800 MHz Technical exhibits and Licensing



Task	Motorola	County	Deliverable
<p>FCC forms and submittals needed for existing and/or new sites or channels, and provide to County for signature and submittal.</p> <ul style="list-style-type: none"> Motorola will be responsible for the coordination and licensing fees for the radio network. <p>If, for any reason, any of the proposed sites or frequencies cannot be used due to reasons beyond Motorola's control, the costs associated with site changes or delays, frequency searches and coordination, etc. including, but not limited to, re-engineering, frequency re-licensing, schedule delays, re-mobilization, etc., will be paid for by County.</p>			

Develop Cutover Plan

Implementation of the Palm Beach County P25 Radio System Modernization will require a detailed cutover plan for a smooth transition from the existing radio system to the new radio system. Table 7-7 defines the deliverables and responsibilities for both County and Motorola. A Cutover Plan is included in Table 7-7 of this proposal.

Table 7-7: Develop Cutover Plan

Task	Motorola	County	Deliverable
Existing system and user information (e.g., dispatch and subscriber), and specific vehicle information, which must be taken in to account to develop a detailed cutover plan.		X	Existing System and User Information
The P25 Radio System cutover plan will be developed, taking into account the need to minimize impact to users migrating to the P25 Radio System.	X	X	Preliminary Cutover Plan

Establish Project Schedule

During CDR the Project Schedule will be finalized through the changes mutually agreed upon between the parties during the CDR. The resulting document defines specific project tasks to be completed and documents the final Project Schedule for each subsystem to be implemented. Table 7-8 defines the deliverables and responsibilities for both the County and Motorola. The Project Schedule will become the governing Project Schedule incorporated into the contract, but is subject to change on mutual agreement of the parties.

Table 7-8: Finalize Project Schedule



Task	Motorola	County	Deliverable
Review identified implementation tasks, priorities, inter-dependencies and other requirements. Identify key project milestones, in addition to tasks that will require interruption of existing communications.	X	X	Project Schedule Review
Prepare final Project Schedule.	X		Project Schedule Finalization
Review the final Project Schedule and identify in writing any specific deficiencies found within 10 business days of receipt.		X	Project Schedule Approval
Changes after Initial Project Schedule Approval.	X	X	Mutually agreed upon through the change order process

Acceptance Test Procedures

Motorola will develop an Acceptance Test Plan (ATP) to provide an understanding of procedures for testing functionality and performance of the system. The tests will validate the functional performance of the system.

An ATP will be finalized as a part of the CDR process. The ATP includes the acceptance criteria to ensure the equipment operates according to specifications identified in the contract. Table 7-9 defines the deliverables and responsibilities for both the County and Motorola.

Table 7-9: Acceptance Test Plan

Task	Motorola	County	Deliverable
Review the overall approach to testing including hardware, software, and final system acceptance criteria.	X	X	Review ATP and Methodology
Provide related information requested by Motorola to assist Motorola in completing the ATP.		X	Information supplied as requested
Create baseline ATP document for County Review.	X		County identifies any deficiencies within 10 business days
Submit a final ATP document to County for approval.	X		Final ATP
Review and approve the final ATP.		X	Approval of Final ATP

7.6.1.6 Order Processing

Upon lock down of the system design at the Detailed Design Review, Motorola will place factory orders for the system hardware that is being purchased for the P25 Radio System. Table 7-10 defines Motorola deliverables and responsibilities.

Table 7-10: Order Processing

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Project Approach - NEGOTIATED C-110

Task	Motorola	County	Deliverable
Factory orders placed for all Motorola-manufactured equipment.	X		Orders for Motorola manufactured equipment
Order placed for all third-party equipment.	X		Third-party equipment orders
Motorola will execute major subcontracts.	X		Subcontracts in place

7.6.1.7 Manufacturing

Manufacturing activities commence after order processing. Table 7-11 defines Motorola deliverables and responsibilities.

Table 7-11: Manufacture Equipment

Task	Motorola	County	Deliverable
Manufacture Motorola equipment.	X		Communications System Hardware ships to Factory Staging area
Track third-party equipment suppliers.	X		Communications System Hardware ships to Factory Staging area

7.6.1.8 P25 Fleetmapping

Concurrent with the manufacturing of the equipment within the System, a preliminary Fleet-map will need to be developed for the Factory Staging. The existing trunking fleetmap will be ported over to serve as a baseline to the new P25 fleetmap. After successful completion of the Factory Test, the System Fleetmap will be finalized and a sample of radio codeplugs to be developed based on the system configuration. Table 7-12 defines the activities of Fleetmapping.

Table 7-12: Template Development and Fleetmapping

Task	Motorola	County	Deliverable
Create a Fleetmapping Team of Motorola and County users.	X	X	Team named and establishes meetings
Review applicability of current Fleet Map and needed changes.	X	X	User feedback as to requirements
Prepare Fleetmap.	X		County identifies any deficiencies
Final Fleetmap prepared and sent to County for approval.		X	Approved Fleetmap

7.6.1.9 Factory Staging

Staging activities commence after the Manufacturing process. Motorola's staging facility; Customer Center for System integration (CCSi) is located in Schaumburg, IL, adjacent to our manufacturing



facility, as well as our engineering, development, and testing teams. This allows Motorola to provide all the technical personnel and test equipment to conduct staging tests.

The Motorola field personnel and the County engineers identified by the County will benefit from attending staging by participating in the construction of the System as it will be installed when shipped to the County and per the Detailed Design Document. This begins the hands on training for County radio personnel.

Table 7-13 defines Motorola deliverables and responsibilities of Factory Staging.

Table 7-13: Factory Staging

Task	Motorola	County	Deliverable
Set up and rack system equipment on a site-by-site basis, as prescribed in the Customer Design Document (CDD).	X		Communications System Hardware
Cut and label cables according to the approved CDD documentation.	X		Cabling matching in-field installation requirements
Label the cables with to/from information to specify interconnection for field installation and future servicing needs.	X		Cabling matching in-field installation requirements
Complete the cabling connection between sub systems.	X		Cabling matching in-field installation requirements
Assemble required subsystems (including Microwave equipment) to assure system functionality.	X		Functional system to perform Staging Tests and Acceptance
Power-up, program, and test all staged equipment.	X		Functional system to perform Staging Tests and Acceptance
Load application parameters on all equipment according to input from System Engineering.	X		Functional system to perform Staging Tests and Acceptance
Complete programming of the Fixed Network Equipment.	X		Functional system to perform Staging Tests and Acceptance
Program the approved templates into the radio-programming template tool.	X		Functional system to perform Staging Tests and Acceptance
County to optionally provide 4 subscriber units to support Factory Acceptance Testing. Motorola to provide programming.		X	4 APX Radios for Factory Acceptance Testing
Complete programming of the sample subscribers.	X		Functional system to perform Staging Tests and Acceptance
Inventory equipment with serial number and installation references.	X		Inputs for Customer Asset Management
Complete System documentation.	X		System Documentation as specified
Provide a mutually agreed to Factory Acceptance Test Plan.	X	X	Factory Test Begins



7.6.1.10 Factory Testing

For factory testing, the system will be configured at CCSi as it will be in the field. The following subsystems will be tested at CCSi:

- Master Core and Redundant Master Core (DSR).
- ASTRO 25 800 MHz Simulcast System, including Prime Site, Redundant Prime Site, and RF Sites.
- ASTRO 25 Aviation Site.
- Microwave Backhaul.
- MCC 7500 Dispatch Consoles and Back-up consoles.

This process will allow County personnel to witness factory testing in a controlled environment, as well as provide a smooth and easy installation in the field. Motorola will perform end-to-end system testing from subscriber units to the dispatch console. Table 7-14 defines the County and Motorola deliverables and responsibilities.



Table 7-14: Factory Testing

Task	Motorola	County	Deliverable
Functional Performance Testing: This test will include the following: <ul style="list-style-type: none"> Physical inspection. Thorough exercise of hardware and software. Testing of voice communications features. Verification of device and system recovery from failures. 	X		Functional Performance tests
Failed tests are documented, corrected and retested. Defective components will be replaced if they cannot pass factory test.	X		Functional Performance tests
Acceptance documents at the successful completion of the Factory Acceptance Testing period.		X	Written approvals of Factory Acceptance Test
Motorola will prepare all racks for shipment and ship staged equipment to a location within the County under Motorola control.	X		Equipment ships
Motorola will supply to the County all documentation and as-built drawings from staging.	X		County receives documentation as well as Factory Test result data

7.6.1.11 Civil Work

Site Development at S-1 Site

This is an existing Palm Beach County site owned by the City of West Palm Beach. Its tower and shelter are due to be replaced as part of a separate project.

Site Scope Summary

- Existing tower to be used for antennas

Microwave Antenna and Waveguide Installation

- Install 4 antenna(s) each with associated waveguide.
- Install 1 dehydrator.
- Install 1 DC power system with 120 VAC 30 amp circuit per rectifier.

Site Development at S-2 Site

This is an existing Palm Beach County roof-top site.

Site Scope Summary

- Existing tower to be used for antennas – 165-foot Rooftop.



Microwave Antenna and Waveguide Installation

- Install 2 antenna(s) each with associated waveguide.
- Re-use existing dehydrator.
- Install new line monitor.
- Install a new rectifier with dedicated 120 VAC 30 amp circuit to the existing Aviat DC power system and replace existing batteries

Site Development at S-3 Site

This is an existing Palm Beach County RF Site. Per the RFP, this site will receive a new manual transfer switch, External generator port and a distribution sub-panel.

Site Scope Summary

- Existing tower to be used for antennas – 410-foot Self-supported Tower.

RF Antenna and Transmission Line Installation

- Install 2 GPS antenna(s).
- Install 1 tower top amplifier(s).
- Install 1/2-inch transmission line as needed.
- Install 7/8-inch transmission line as needed.
- Install 1-1/4-inch transmission line as needed.
- Perform sweep tests on transmission lines.
- Supply and install 1 ground buss bar at the bottom of the antenna support structure for grounding RF cables before they make horizontal transition.

Microwave Antenna and Waveguide Installation

- Install 5 antenna(s) each with associated waveguide.
- Re-use existing dehydrator.
- Install new line monitor.
- Install a new rectifier to the existing Aviat DC power system with dedicated 120 VAC 30 amp circuit and relocate existing batteries from S-15.

Existing Facility Improvement Work

- Supply and install one 200-amp breaker panel with capacity for 30 circuits off the existing UPS subpanel.
- Install 3 8-outlet distribution-bar(s) and wire each outlet to individual breaker.
- Install 1 manual transfer switch and connect it to generator and electric main.

Miscellaneous Work

- Provide and install external connector for portable generator.
- Remove existing transmission lines, tower top amp and associated cabling.

Site Development at S-4 Site

This is an existing Palm Beach County roof-top RF Site. Per the RFP, this site will receive a new distribution sub-panel.

Site Scope Summary

- Engineering services for site drawings and regulatory approvals – Not included.
- Site acquisition services – Not included.

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- Zoning Services – Not included.
- Existing tower to be used for antennas – 270-foot Rooftop.

RF Antenna and Transmission Line Installation

- Install 2 GPS antenna(s).
- Install 1/2-inch transmission line as needed.
- Install 7/8-inch transmission line as needed.
- Install 1-1/4-inch transmission line as needed.
- Perform sweep tests on transmission lines.
- Supply and install 1 ground buss bar at the bottom of the antenna support structure for grounding RF cables before they make horizontal transition.

Microwave Antenna and Waveguide Installation

- Install 1 antenna each with associated waveguide.
- Install 1 dehydrator
- Install 1 DC power system with 120 VAC 30 amp circuit per rectifier.

Existing Facility Improvement Work

- Supply and install one 200-amp breaker panel with capacity for 30 circuits off the existing UPS subpanel.
- Install 3 8-outlet distribution-bar(s) and wire each outlet to individual breaker.

Miscellaneous Work

- Remove existing transmission lines, tower top amp and associated cabling.

Site Development at S-5 Site

This is an existing Palm Beach County RF Site. Per the RFP, this site will receive a new distribution sub-panel.

Site Scope Summary

- Existing tower to be used for antennas – 400-foot Self-supported Tower.

RF Antenna and Transmission Line Installation

- Install 2 GPS antenna(s).
- Install 1 tower top amplifier(s).
- Install 1/2-inch transmission line as needed.
- Install 7/8-inch transmission line as needed.
- Install 1-1/4-inch transmission line as needed.
- Perform sweep tests on transmission lines.
- Supply and install 1 ground buss bar at the bottom of the antenna support structure for grounding RF cables before they make horizontal transition.

Microwave Antenna and Waveguide Installation

- Install 3 antennas with associated waveguide.
- Install 1 dual polarization antenna with two associated waveguides.
- Re-use 1 existing antenna and replace associated waveguide.
- Install 1 dehydrator.
- Install 1 DC power system with 120 VAC 30 amp circuit per rectifier.



Existing Facility Improvement Work

- Supply and install 1 200-amp breaker panel with capacity for 30 circuits off the existing UPS subpanel.
- Install 3 8-outlet distribution-bar(s) and wire each outlet to individual breaker.

Miscellaneous Work

- Remove existing transmission lines, tower top amp and associated cabling.

Site Development at S-7 Site

This is an existing Palm Beach County RF Site. Per the RFP, this site will receive a new manual transfer switch, External generator port and a distribution sub-panel.

Site Scope Summary

- Existing tower to be used for antennas – 325-foot Self-supported Tower.

RF Antenna and Transmission Line Installation

- Install 1 antenna for the RF system.
- Supply and install 1 heavy duty mount(s) for Bogner antennas.
- Install 2 GPS antenna(s).
- Install 1 tower top amplifier(s).
- Install 1/2-inch transmission line as needed.
- Install 7/8-inch transmission line as needed.
- Install 1-1/4-inch transmission line as needed.
- Perform sweep tests on transmission lines.
- Supply and install 1 ground buss bar at the bottom of the antenna support structure for grounding RF cables before they make horizontal transition.

Microwave Antenna and Waveguide Installation

- Install 2 antennas each with associated waveguide.
- Re-use existing dehydrator.
- Install new line monitor.
- Install a new rectifier with dedicated 120 VAC 30 amp circuit to the existing Aviat DC power system and upgrade existing batteries.

Existing Facility Improvement Work

- Supply and install 1 200-amp breaker panel with capacity for 30 circuits off the existing UPS subpanel.
- Install 3 8-outlet distribution-bar(s) and wire each outlet to individual breaker.
- Install 1 manual transfer switch and connect it to generator and electric main.

Miscellaneous Work

- Provide and install external connector for portable generator.
- Remove existing transmission lines, tower top amp and associated cabling.

Site Development at S-8 Site

This is an existing Palm Beach County RF Site. Per the RFP, this site will receive a new manual transfer switch, External generator port and a distribution sub-panel.



Site Scope Summary

- Existing tower to be used for antennas – 350-foot Self-supported Tower.

RF Antenna and Transmission Line Installation

- Install 2 GPS antenna(s).
- Install 1 tower top amplifier(s).
- Install 1/2-inch transmission line as needed.
- Install 7/8-inch transmission line as needed.
- Install 1-1/4-inch transmission line as needed.
- Perform sweep tests on transmission lines.
- Supply and install 1 ground buss bar at the bottom of the antenna support structure for grounding RF cables before they make horizontal transition.

Microwave Antenna and Waveguide Installation

- Install 3 antenna(s) each with associated waveguide.
- Install 1 dehydrator.
- Install 1 DC power system with 120 VAC 30 amp circuit per rectifier.

Existing Facility Improvement Work

- Supply and install 1 200-amp breaker panel with capacity for 30 circuits off the existing UPS subpanel.
- Install 3 8-outlet distribution-bar(s) and wire each outlet to individual breaker.
- Install 1 manual transfer switch and connect it to generator and electric main.

Miscellaneous Work

- Provide and install external connector for portable generator.
- Remove existing transmission lines, tower top amp and associated cabling.

Site Development at S-11 Site

This is an existing Palm Beach County RF Site. Per the RFP, this site will receive a new manual transfer switch, External generator port and a distribution sub-panel.

Site Scope Summary

- Existing tower to be used for antennas – 320-foot Self-supported Tower.

RF Antenna and Transmission Line Installation

- Install 2 GPS antenna(s).
- Install 1 tower top amplifier(s).
- Install 1/2-inch transmission line as needed.
- Install 7/8-inch transmission line as needed.
- Install 1-1/4-inch transmission line as needed.
- Perform sweep tests on transmission lines.
- Supply and install 1 ground buss bar at the bottom of the antenna support structure for grounding RF cables before they make horizontal transition.

Microwave Antenna and Waveguide Installation

- Install 2 antennas each with associated waveguide.
- Install 1 dehydrator.



- Install 1 DC power system with 120 VAC 30 amp circuit per rectifier.

Existing Facility Improvement Work

- Supply and install 1 200-amp breaker panel with capacity for 30 circuits off the existing UPS subpanel.
- Install 3 8-outlet distribution-bar(s) and wire each outlet to individual breaker.
- Install 1 manual transfer switch and connect it to generator and electric main.

Miscellaneous Work

- Provide and install external connector for portable generator.
- Remove existing transmission lines, tower top amp and associated cabling.

Site Development at S-15 Site

This is an existing Palm Beach County Microwave Only Site. Per the RFP, this site will receive a new UPS and a distribution sub-panel.

Site Scope Summary

- Existing tower to be used for antennas – 135-foot Self-supported Tower.

Existing Facility Improvement Work

- Supply and install 1 200-amp breaker panel with capacity for 30 circuits off the Motorola provided UPS.
- Install 3 8-outlet distribution-bar(s) and wire each outlet to individual breaker.
- Install 1 new UPS and wire output to UPS distribution panel.

Microwave Antenna and Waveguide Installation

- Install 2 antenna(s) each with associated waveguide.
- Re-use existing dehydrator.
- Install new line monitor.
- Install new rectifier with dedicated 120 VAC 30 amp circuit to the existing Aviat DC power system and upgrade existing batteries.

Site Development Site S-20

Site Scope Summary

- Existing tower to be used for antennas – 150-foot Self-supported Tower.

Microwave Antenna and Waveguide Installation

- Install 2 antenna(s) each with associated waveguide.
- Install 1 dehydrator.
- Install 1 DC power system with 120 VAC 30 amp circuit per rectifier.

Site Development at S-22 Site

This is an existing Palm Beach County RF Site. Per the RFP, this site will receive a new manual transfer switch, External generator port and a distribution sub-panel.

Site Scope Summary

- Existing tower to be used for antennas – 190-foot Guyed Tower.

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Project Approach - NEGOTIATED C-119

RF Antenna and Transmission Line Installation

- Install 2 GPS antenna(s).
- Install 1 tower top amplifier(s).
- Install 1/2-inch transmission line as needed.
- Install 7/8-inch transmission line as needed.
- Install 1-1/4-inch transmission line as needed.
- Perform sweep tests on transmission lines.
- Supply and install 1 ground buss bar at the bottom of the antenna support structure for grounding RF cables before they make horizontal transition.

Microwave Antenna and Waveguide Installation

- Install 4 antennas each with associated waveguide.
- Install 1 dehydrator.
- Install a new rectifier with dedicated 120 VAC 30 amp circuit to the existing Aviat DC power system and re-use existing battery string from S-2.

Existing Facility Improvement Work

- Supply and install 1 200-amp breaker panel with capacity for 30 circuits off the existing UPS subpanel.
- Install 3 8-outlet distribution-bar(s) and wire each outlet to individual breaker.
- Install 1 manual transfer switch and connect it to generator and electric main.

Miscellaneous Work

- Provide and install external connector for portable generator.
- Remove existing transmission lines, tower top amp and associated cabling.

Site Development at S-25 Site

This is an existing Palm Beach County RF Site. Per the RFP, this site will receive a new 150kw generator and an automatic transfer switch, External generator port, UPS and a distribution sub-panel.

Site Scope Summary

- New fuel tank size – 2000 gallons- , Type – Diesel above-ground (no belly tank).
- New generator size – 150 kW, Type – Outdoor.
- Existing tower to be used for antennas – 400-foot Self-supported Tower.

Site Components Installation

- Construct 1 concrete slab for 2000 gallon above-ground diesel fuel tank at 3000 psi with reinforcing steel necessary for foundations.
- Construct 1 foundation for the 150 kW generator with reinforcing steel necessary for foundations.
- Supply and install 1 2000-gallon above-ground diesel fuel tank(s), fill it with fuel and connect it to the generator.
- Supply and install 1 standby power generator (150 kW) located within 20 feet of the ATS, including interconnection wiring between the generator, transfer switch, and site electrical service mains.
- Supply and install a perimeter grounding system around the compound and shelter. The ground system is to tie to the fence and all new metal structures within the compound to meet current Motorola's R56 standards.



RF Antenna and Transmission Line Installation

- Install 2 GPS antenna(s).
- Install 4 RF antenna(s).
- Install 1 tower top amplifier(s).
- Install 1/2-inch transmission line as needed.
- Install 7/8-inch transmission line as needed.
- Install 1-1/4-inch transmission line as needed.
- Perform sweep tests on transmission lines.
- Supply and install 1 ground buss bar at the bottom of the antenna support structure for grounding RF cables before they make horizontal transition.

Microwave Antenna and Waveguide Installation

- Install 6 antenna(s) each with associated waveguide.
- Install 1 dual polarization antenna with two associated waveguides.
- Re-use one existing antenna and replace associated waveguide.
- Install 1 dehydrator.
- Install 1 DC power system with 120 VAC 30 amp circuit per rectifier.

Existing Facility Improvement Work

- Supply and install 1 200-amp breaker panel with capacity for 30 circuits off the existing UPS subpanel.
- Supply and install 1 200-amp breaker panel with capacity for 30 circuits off the new Motorola provided UPS.
- Install 3 8-outlet distribution-bar(s) and wire each outlet to individual breaker.
- Install 1 automatic transfer switch and connect it to generator and electric main.
- Install 1 new UPS and wire output to UPS distribution panel.

Miscellaneous Work

- Remove existing transmission lines, tower top amp and associated cabling.

Site Development at S-31 Site

This is an existing Palm Beach County RF Site. Per the RFP, this site will receive a new manual transfer switch, External generator port and a distribution sub-panel.

Site Scope Summary

- Existing tower to be used for antennas – 450-foot Guyed Tower.

RF Antenna and Transmission Line Installation

- Install 4 antenna(s) for the RF system. (
- Supply and install 4 new antenna mounts.
- Install 2 GPS antenna(s).
- Install 1 tower top amplifier(s).
- Install 1/2-inch transmission line as needed.
- Install 7/8-inch transmission line as needed.
- Install 1-1/4-inch transmission line as needed.
- Perform sweep tests on transmission lines.
- Supply and install 1 ground buss bar at the bottom of the antenna support structure for grounding RF cables before they make horizontal transition.



Microwave Antenna and Waveguide Installation

- Install 4 antennas each with associated waveguide.
- Install 1 dehydrator.
- Install new rectifier with dedicated 120 VAC 30 amp circuit to the existing Aviat DC power system and re-use existing battery string from S-3.

Existing Facility Improvement Work

- Supply and install 1 200-amp breaker panel with capacity for 30 circuits off the existing UPS subpanel.
- Install 3 8-outlet distribution-bar(s) and wire each outlet to individual breaker.
- Install 1 manual transfer switch and connect it to generator and electric main.

Miscellaneous Work

- Provide and install external connector for portable generator.
- Remove existing transmission lines, tower top amp and associated cabling.

Site Development at S-32 Site

This is an existing Palm Beach County RF Site. Per the RFP, this site will receive a new manual transfer switch, External generator port and a distribution sub-panel.

Site Scope Summary

- Existing tower to be used for antennas – 260-foot Self-supported Tower.

RF Antenna and Transmission Line Installation

- Install 4 antenna(s) for the RF system.
- Install 2 GPS antenna(s).
- Install 1 tower top amplifier(s).
- Install 1/2-inch transmission line as needed.
- Install 7/8-inch transmission line as needed.
- Install 1-1/4-inch transmission line as needed.
- Perform sweep tests on transmission lines.
- Supply and install 1 ground buss bar at the bottom of the antenna support structure for grounding RF cables before they make horizontal transition.

Microwave Antenna and Waveguide Installation

- Install 4 antennas each with associated waveguide.
- Install 1 dehydrator.
- Install a new rectifier with dedicated 120 VAC 30 amp circuit to existing Aviat DC power system and re-use existing battery string from S-7.

Existing Facility Improvement Work

- Supply and install 1 200-amp breaker panel with capacity for 30 circuits off the existing UPS subpanel.
- Install 3 8-outlet distribution-bar(s) and wire each outlet to individual breaker.
- Install 1 manual transfer switch and connect it to generator and electric main.

Miscellaneous Work

- Provide and install external connector for portable generator.
- Remove existing transmission lines, tower top amp and associated cabling.

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Project Approach - NEGOTIATED C-122

Site Development at S-33 Site

This is an existing Palm Beach County roof-top Site. Per the RFP, this site will receive a new UPS and distribution sub-panel.

Site Scope Summary

- Existing tower to be used for antennas – 200-foot Rooftop.

RF Antenna and Transmission Line Installation

- Install 3 antenna(s) for the RF system.
- Install 1 tower top amplifier.
- Supply and install 3 6-foot side arm(s) for antenna mounts.
- Install 7/8-inch transmission line as needed.
- Install 1-1/4-inch transmission line as needed.
- Perform sweep tests on transmission lines.
- Supply and install 1 ground buss bar at the bottom of the antenna support structure for grounding RF cables before they make horizontal transition.

Microwave Antenna and Waveguide Installation

- Install 1 antenna with associated waveguide.
- Install 1 dehydrator.
- Install 1 DC power system with 120 VAC 30 amp circuit per rectifier.

Existing Facility Improvement Work

- Supply and install 1 200-amp breaker panel with capacity for 30 circuits off the new Motorola provided UPS.
- Install 3 8-outlet distribution-bar(s) and wire each outlet to individual breaker.
- Install 1 new UPS and wire output to UPS distribution panel.
- Feed the UPS and DC power system from the generator panel in the room and within 35 feet.

Motorola Responsibilities (all site unless otherwise noted):

Site Engineering

- Perform National Environmental Policy Act (NEPA) Threshold Screening, including limited literature and records search and brief reporting, as necessary to identify sensitive natural and cultural features referenced in 47 Code of Federal Regulations (CFR) Chapter 1, subsection 1.1307 that may be potentially impacted by the proposed construction activity. This does not include the additional field investigations to document site conditions if it is determined that the proposed communication facility “may have a significant environmental impact” and thus require additional documentation, submittals, or work.
- Provide a structural engineering analysis for antenna support structure, if necessary, to support the proposed antenna system. If the tower structure or rooftop fails the analysis, the cost of any site relocation or modifications to the tower required to support the antenna system will be the responsibility of Palm Beach County, FL. NOTE: This task does not include structural measurement survey, materials testing, geotechnical investigation, and/or other field investigation to acquire the data. If applicable, these tasks will be noted separately in the SOW.



- Provide tower climbing and tower mapping services for towers to collect information about structural members and existing equipment.
- Preparation, submission and tracking of application for local permit fees (zoning, electrical, building etc.) and procurement of information necessary for filing.

Customer Responsibilities: (all sites unless otherwise noted)

- If required, prepare and submit Electromagnetic Energy (EME) plans for the site (as a licensee) to demonstrate compliance with FCC RF Exposure guidelines.
- Review and approve site design drawings within 10 business days of submission by Motorola or its subcontractor(s). Should a re-submission be required, the Customer shall review and approve the re-submitted plans within 10 business days from the date of submittal.
- Pay for the usage costs of power, leased lines and generator fueling both during the construction/installation effort and on an on-going basis. (with the exception of the new fuel tank at S-25).
- Provide personnel to observe construction progress and testing of site equipment according to the schedule provided by Motorola.
- As applicable (based on local jurisdictional authority), the Customer will be responsible for any installation or upgrades of the existing electrical systems in order to comply with NFPA 70, Article 708.
- Provide property deed or lease agreement, and boundary survey, along with existing as-built drawings of the site and site components to Motorola for conducting site engineering.
- Provide a right of entry letter from the site owner for Motorola to conduct field investigations.
- Arrange for space on the structure for installation of new antennas at the proposed heights on designated existing antenna-mounting structures.
- Provide as-built structural and foundation drawings of the structure and site location(s) along with geotechnical report(s) for Motorola to conduct a structural analysis.
- With the exception of S-33, provide support facilities for the antenna cables (cable ladder, entry ports, waveguide bridge) from the antenna to the equipment room.
- Pay for any upgrade of the antenna support structure if the structural analysis requires it.
- Provide space, HVAC, grounding, surge suppression, lighting, fire suppression and cabling facilities for the equipment room.
- Provide support and entry facilities for the cables (cable ladder/chaseaway, entry ports, etc.) between the proposed equipment locations.

Assumptions:

- No prevailing wage, certified payroll, mandatory union workers or mandatory minority workers are required for this work.
- Most work is assumed to be done during normal business hours as dictated by time zone and mutually agreed upon with the exception of the system cutover and dispatch installation. (Monday thru Friday, 7:30 a.m. to 5:00 p.m.).
- A maximum of 30 days will be required for obtaining approved permits from time of submission.
- AM detuning or electromagnetic emission studies will not be required.



- Protective grating over microwave dishes or the communications shelter has not been included in this proposal.
- Lead paint testing of existing painted towers has not been included.
- Underground utilities are not present in the construction area and as such no relocation will be required. (S-25)
- Structural analyses for towers or other structures that have not been performed by Motorola will relinquish Motorola from any responsibility for the analysis report contents and/or recommendation therein.
- Foundations for generator, and fuel tank are based on “normal soil” conditions as defined by TIA/EIA 222-G. Footings deeper than 30 inches, raised piers, rock coring, dewatering, or hazardous material removal have not been included. (S-25)
- A clear obstruction-free access exists from the antenna location to the equipment room.
- The Customer does not require Motorola to upgrade the existing site to meet Motorola’s R56 standards.
- The floor can support the proposed new loading. Physical or structural improvements to the existing room will not be required.

Supplemental Completion Criteria

- Site development completed per issued for construction (IFC) drawings, project requirements, contractual obligations (including any customer/Motorola approved changes) and approved by Palm Beach County, FL.
- This shall be confirmed by contractor and reviewed with Motorola construction manager and project manager before inspections occur.
- All jurisdictional and contractual required testing and inspections to be performed by the contractor. (Contractual testing and inspections defined and agreed to with project team and customer prior to project kick off; vendor solely responsible for conducting, coordinating and paying for all jurisdictional testing and inspections.)
- Motorola site development checklist shall be completed and signed off by contractor prior to customer inspection. (Review with project team and customer and amend checklist as required at project kick off or before work begins.)
- Site turn-over package completed and turned over to Motorola (As defined and agreed to with project team and customer.)
- All punchlist and deficiencies shall be completed prior to customer and Motorola inspections.

7.6.1.12 Installation of Fixed Network Equipment

Installation of the Fixed Network Equipment (FNE) consists of the radio communications infrastructure, computer, and dispatch equipment and RF Sites.

Table 7-15 defines the deliverables and responsibilities for both County and Motorola during installation of the Fixed Infrastructure Equipment stage.

Table 7-15: Installation of Fixed Network Equipment

Task	Motorola	County	Deliverable
Participate in a mandatory project site survey with the County and determine exact locations of equipment. This	X	X	Final CDR Design Document

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Project Approach - NEGOTIATED C-125

Task	Motorola	County	Deliverable
information will be incorporated into the CDR Design Document.			
Motorola will prepare the site for equipment installations per Motorola's R56 standards. Sites will be ready according to the Project Schedule for equipment installation.	X	X	Sites Meeting Site Preparation Requirements for Installation
<p>General Installation Responsibilities:</p> <ul style="list-style-type: none"> Motorola will install the new system equipment provided in the Equipment List. Motorola will ground and bond the site equipment to the ground system, in accordance with the R56 site installation standards. Worksites shall be left neat and broom swept each day. Motorola will remove and dispose of any debris that is a result of the project activities from the site and clean the site prior to acceptance. Motorola shall furnish all cables for power, audio, control, and microwave transmission to connect the supplied equipment to the power panels or receptacles and the audio/control line connection point. All cabling shall be cut to length, properly connected and terminated per Owner installation standards and clearly labeled at both ends. All associated punch block connections shall be properly labeled. Motorola shall ground and bond all provided equipment during installation and is responsible for connecting all equipment to the common ground system at the existing facilities. All cabinets, racks, enclosures, telephone circuit surge protectors, and transmission line surge protectors provided shall be connected to the single point ground. Motorola shall connect all ground connections using approved non-reversible crimp or clamp connections. All cabling, port assignments, and punch block connections shall be recorded into the final system as-built documentation. 	X		New Equipment Installations per Motorola's Site Quality Standards
Motorola will install Master Site and Prime Site Equipment in accordance with the	X		Radio System Installation Audit



Task	Motorola	County	Deliverable
Design Review Scope of Services and Equipment Lists.			
Motorola will install ASTRO 25 Trunked Repeater Site equipment in accordance with the Design Review Scope of Services and Equipment Lists.	X		Radio System Installation Audit
Motorola will install the ASTRO 25 Aviation Site in Downtown Palm Beach.	X		Radio System Installation Audit
Motorola will install radio dispatch equipment at all 10 of the Remote County Locations in accordance with the Design Review Scope of Services and Equipment Lists. Motorola anticipates re-using the existing control station antenna systems and dispatcher headsets at the County's current dispatch facilities.	X		Radio System Installation Audit
The County will be responsible for providing T1 connectivity at all dispatch locations not currently on the microwave network. The T1 plan will be designed and scheduled by Motorola to support the new redundant Master Site Configuration.		X	T1 connectivity and last mile connections to the equipment rooms at each dispatch facility
If required the County will be responsible for providing Ethernet connectivity between S-29 and S-2.		X	
Motorola will also provide the Logging AIS as required per the County's specifications. It will be the responsibility of the County and their Logging vendors to integrate the Motorola provided AIS to the County's P25 capable Logging Solutions.	X	X	Integration of existing Logging solution
Motorola will install all Conventional equipment in accordance with the Design Review Scope of Services and Equipment lists.	X		Radio System Installation Audit
Motorola will install the new microwave equipment in accordance with the Design Review Scope of Service and Equipment Lists.	X		Radio System Installation Audit
Motorola will remove decommissioned equipment associated with the existing trunked radio and place it in a County designated location.	X		Decommissioned equipment in receipt of the County
County will sign installation acceptance certificates after inspection and check out of FNE on a site-by-site, system-by-system basis.		X	Signed Installation Acceptance Documents



7.6.1.13 Systems Integration and Optimization

Once all equipment is installed in place, Motorola will configure, optimize and program all system equipment and subsystems as detailed in the Detailed Design Document. During this phase, the System Technologist will perform the Installed Component Level Testing on the RF equipment. These tests will be witnessed by the County or its representative at the time each site is optimized for operation within the system. Note that this optimization could occur outside of the 8 AM to 5 PM workday depending on schedule. Table 7-16 identifies candidate equipment for component testing. Motorola System Technologist(s) will be on site for this phase and will prepare the system for acceptance testing.

Table 7-16 defines the deliverables and responsibilities for both County and Motorola during Systems Integration and Optimization.

Table 7-16: Systems Integration and Optimization

Task	Motorola	County	Deliverable
Provide and install all communication lines and equipment that are not Motorola-provided deliverables. Liaison support with agencies and County vendors required to support the solution. Ensure that necessary technical support is available for installation and testing of subsystems not included in this offer.		X	County Provided Equipment and Interfaces Required for Integration
Install, integrate, and test the hardware, software, and interfaces as specified in the System Description.	X		Installation and Integration of Equipment
Perform Component Test, as witnessed by the county and document results in a matter agreed to in CDR for the following equipment <ul style="list-style-type: none"> RF Base Stations. RF Control Stations. 	X	X	Individual Component Test Results
Maintain a punchlist of items that need resolution. Manage the resolution of punchlist items.	X		Punchlist Resolution
County gives its approval to move forward to System Acceptance Phase.		X	Final Acceptance Tests begin

7.6.1.14 Final Acceptance Testing

Final Acceptance Testing includes a Functional Acceptance test, Coverage Acceptance Test, and 30 Day Operational Burn-in.

Motorola will submit the draft Acceptance Test Plan defined during the Design Review for approval 90 calendar days prior to the beginning of Acceptance Testing. The County shall be given two weeks written notice that the system is ready for final acceptance testing.



Functional Acceptance Test

System Functional Acceptance Tests will be performed after system optimization is complete. The Functional Acceptance Tests verify the functionality tested at Factory Testing. A complete list of the Functional Acceptance Tests will be provided during the CDR.

If deficiencies are found during the testing, both the deficiencies and resolutions to the deficiencies shall be agreed upon and documented. If the documented deficiencies do not prevent productive, operational use of the system, as determined by County, the test will be deemed complete. However, Motorola will remain responsible for the resolution of the documented deficiencies using a punch list as a controlling document for resolution planning.

Table 7-17 defines the deliverables and responsibilities for both County and Motorola.

Table 7-17: Functional Acceptance Test

Task	Motorola	County	Deliverable
Motorola will perform functional ATPs. During each test, test results will be recorded for review and approval of the test.	X		Execution of Functional Acceptance Testing
Motorola and the County will provide adequate personnel to perform the test.	X	X	Acceptance test Plan
Upon successful completion of each Acceptance test on a site-by-site and system-by-system level, County and Motorola will sign acceptance certificates documenting acceptance.		X	Written Approval of Successful Functional Acceptance Testing

Coverage Acceptance Tests

Coverage Acceptance Tests will be performed when the RF site and control equipment installations and optimization are complete. The Coverage Acceptance Tests verify the coverage performance of the P25 Radio System Modernization. As part of CDR a cutover plan will be submitted to the County for approval including all elements outlined in the County's Requirement Document. Table 7-18 defines the deliverables and responsibilities for both County and Motorola.

Table 7-18: Coverage Acceptance Tests

Task	Motorola	County	Deliverable
The Coverage ATP will be performed per the agreed upon CATP.	X		Execution of Coverage Acceptance Tests
The County will be responsible for providing test radios and vehicles to support the required coverage testing.		X	Optimized APX and XTL/XTS radios for coverage testing and vehicles for the required number of test teams as outlined by the agreed upon CATP
Test results will be recorded for review and approval of the test.	X		
Upon successful completion of the coverage acceptance test, County and Motorola will sign acceptance certificates documenting acceptance.	X	X	Written Approval of Successful Coverage Acceptance Testing



30 Calendar Day Operational Test

Motorola will perform a 30 calendar day operational test of the system to ensure that the hardware and software defects have been corrected prior to final system acceptance. The operational tests during this time will be outlined in the Final Acceptance Testing outlined above. Table 7-19 defines the deliverables and responsibilities for both County and Motorola.

Table 7-19: 30 Calendar Day Operational Test

Task	Motorola	County	Deliverable
Motorola and County will agree on what constitutes a critical failure prior to commencing the 30 calendar day operational test.	X	X	Written definition of critical failure
Motorola will perform a 30 calendar day operational test which will include a limited sub-set of County radio users to use the system for non-critical communications. The usage of the system during this time will not be considered beneficial use.	X		Execution of Final Acceptance Testing
Upon successful completion of the 30 calendar day test the County and Motorola will approve all test results and proceed to cutover.	X	X	County confirms acceptance of test results and approves cutover to new system

7.6.1.15 Cutover to New System Operations

Following successful completion of the Acceptance Tests, Motorola will cut over the users to the new communications system. This phase will follow the approved cutover plan. Table 7-20 defines the deliverables and responsibilities for both County and Motorola.

Table 7-20: Cutover to New Systems Operations

Task	Motorola	County	Deliverable
Motorola will develop the cutover plan and schedule system cutover with the County. The plan will be detailed at the subsystem level delineating between systems that affect and do not affect ongoing operations.	X		Completed Cutover Checklist
The elements of the Cutover Plan will include necessary labor required by Motorola and the County to execute the plan. A schedule and procedure and user transition training for each County operational group.	X	X	Completed Cutover Checklist
The County will be responsible for providing all County Motorola manufactured P25 enabled subscribers programmed with the new agreed upon P25 Fleetmap to support the mutually agreed upon cutover plan. Motorola will provide code plug review only to validate system compatibility	X	X	P25 enabled subscriber fleet.

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Project Approach - NEGOTIATED C-130

Task	Motorola	County	Deliverable
County will confirm the cutover plan and that County planning for execution of the system cutover has occurred.		X	Written Approval of Cutover Check List
County and Motorola will execute the cutover plan.	X	X	Cutover to New System Operations

7.6.1.16 System Documentation

Motorola provides documentation of the system configurations, physical installation, and system testing. Documentation is created and updated during the project. Electronic versions of custom documentation will be provided both in a viewable format and in the documents standard format. Table 7-21 defines Motorola's deliverables for system documentation throughout the project.

Table 7-21: System Documentation

Task	Motorola	County	Deliverable
Design Documentation including: <ul style="list-style-type: none"> Documentation Index. System description. Deliverables list. Site Planning and Preparation Manuals. Block and level diagrams for system and sites. Floor plans. Radio Communication System Technical Data. Coverage maps. System Administrator Documentation. Installation and Cutover Plan. Acceptance test procedures. Programming parameters. 	X		Completed at CDR
Factory Staging Documentation including: <ul style="list-style-type: none"> Programming templates. Interconnection drawings. Interconnection charts. Manufacturer's standard operator manuals. Interconnection cable description and inventory. Inventory with serial numbers and installation reference. Software/firmware version numbers. Manufacturer's standard technical manuals. 	X		Completed at end of Factory Staging
System manuals as-builts including: <ul style="list-style-type: none"> Standard Equipment manuals. System drawings. Fixed Equipment documentation. Plan and elevation views of the equipment installation at the radio site. Equipment inter-cabling diagrams for 	X		Upon system Acceptance



Task	Motorola	County	Deliverable
<ul style="list-style-type: none"> each site. Demarcation wiring lists. Programming and level setting data sheets. Equipment by site: <ul style="list-style-type: none"> Key access procedures. Site inventory lists. Remote sign-on procedures and passwords. Software versions and equipment wiring by equipment site. Radio licenses. Field ATP test sheets and results. R56 site audit. Maintenance records. Warranty information. Service Provider. 			
Motorola will provide equipment manuals covering both standard and optional features. The content of these manuals is standardized and may not be specific to County.	X		Upon Final Acceptance

7.6.1.17 System Acceptance

Completion Criteria

This task is considered complete upon County approval and sign-off of the Equipment Installation Acceptance, Functional Acceptance Test, 30 Calendar Day Operational Test and Coverage Acceptance Test.

Successful completion of the acceptance tests constitutes acceptance of the software and hardware provided by Motorola. Upon completion of this Acceptance Test Plan, County representatives participating in and observing the tests will sign off on the ATP in accordance with the contract.

If no punch list items are identified during the acceptance testing process, and Motorola has completed all other project deliverables, County's authorized signature will represent Final System Acceptance. If a punch list of unresolved issues is created as a result of the acceptance testing, Final System Acceptance will occur upon resolution of all items on the punchlist.

Table 7-22 defines the deliverables and responsibilities for both County and Motorola.

Table 7-22: System Acceptance Responsibility Matrix

Task	Motorola	County	Deliverable
Decommission and remove RF equipment.	X		Equipment removed and relocated to a location determined by County
Resolve punchlist items documented at System Cutover.	X		Approved Punchlist Resolution



Task	Motorola	County	Deliverable
Ensure that the criteria defined to transition the project to the Motorola Service Organization have been completed, including the development of a Customer Support Plan with County.	X		Service Transition Certificate and Customer Support Plan
All documents listed in System Manual – “As-Built” Documentation Section will be submitted as they become ready.	X		System Manual – “As-Built” Documents
Final approvals of all System Manual – “As-Built” documents.		X	Written Approval Statement(s)
Acknowledge Final Project Acceptance on completion of the criteria for Final Project Acceptance of the P25 Radio System Modernization.		X	Signed Final Project Acceptance Documents

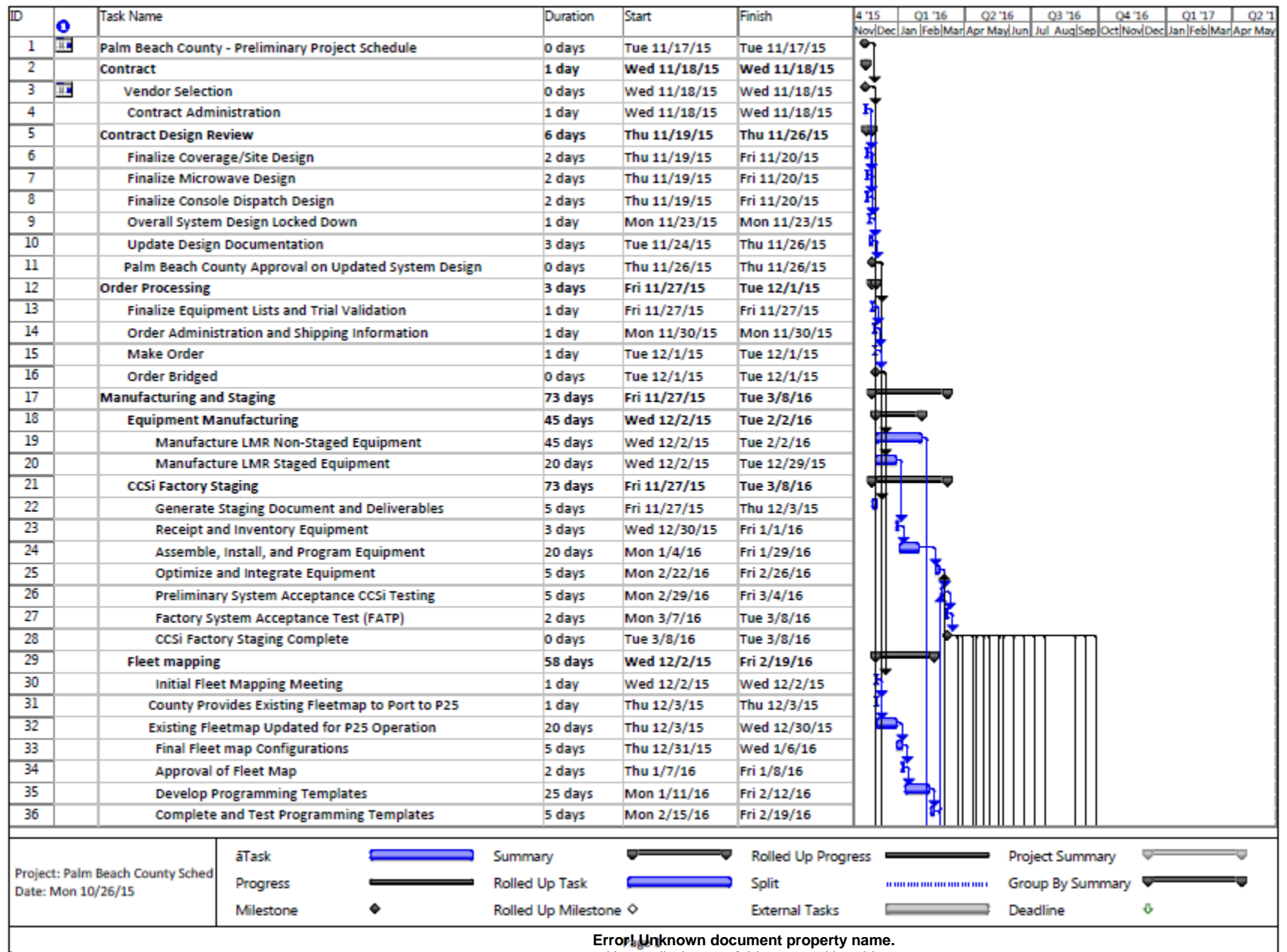
Completion Criteria

This task is considered complete when County and Motorola have signed the Final Project Acceptance Certificate, representing the completion of the system and acknowledgement of System Acceptance as described in the Acceptance Test Plan.

7.6.2 Project Schedule

Attached is a preliminary project schedule for Palm Beach County.

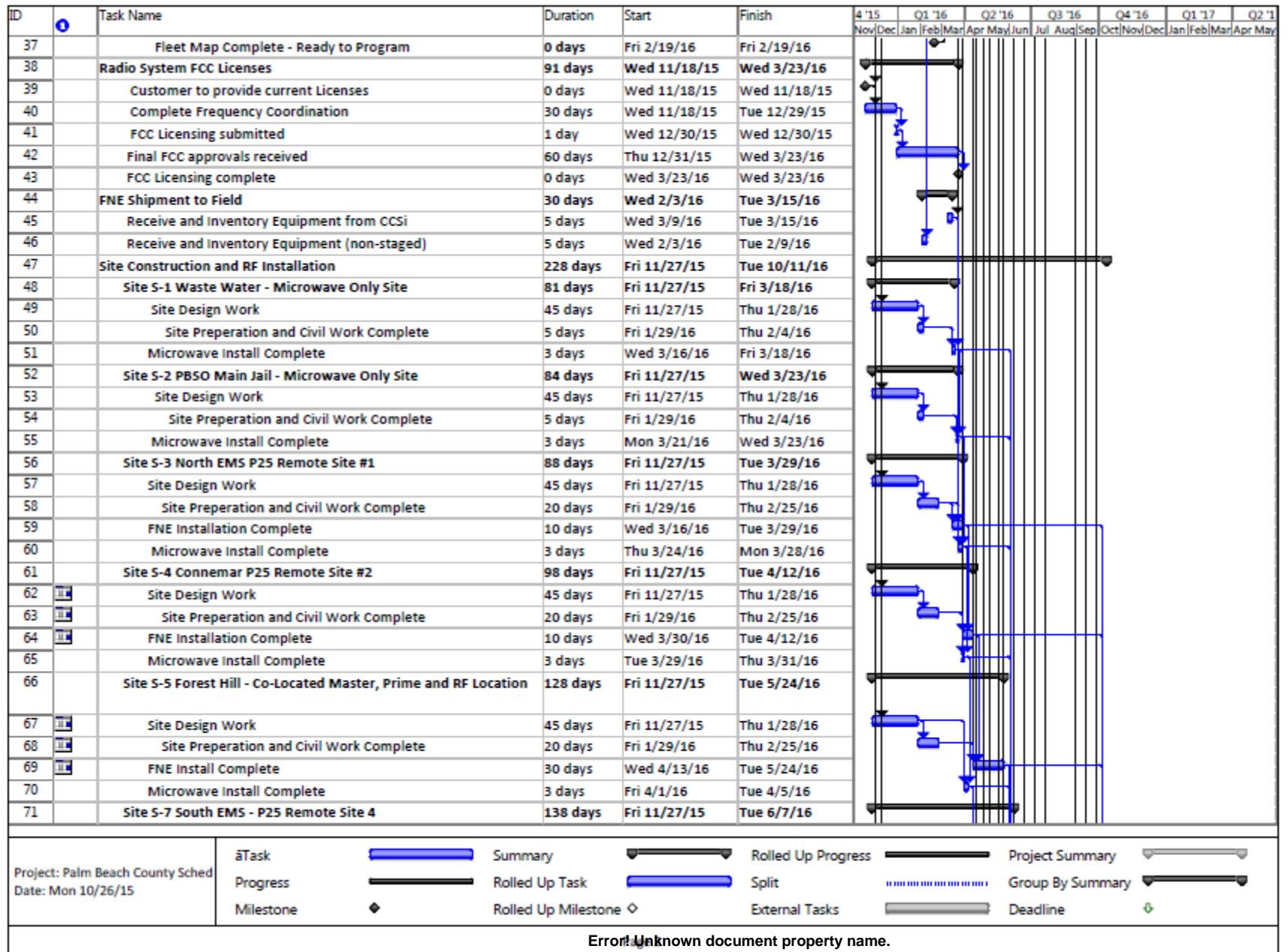




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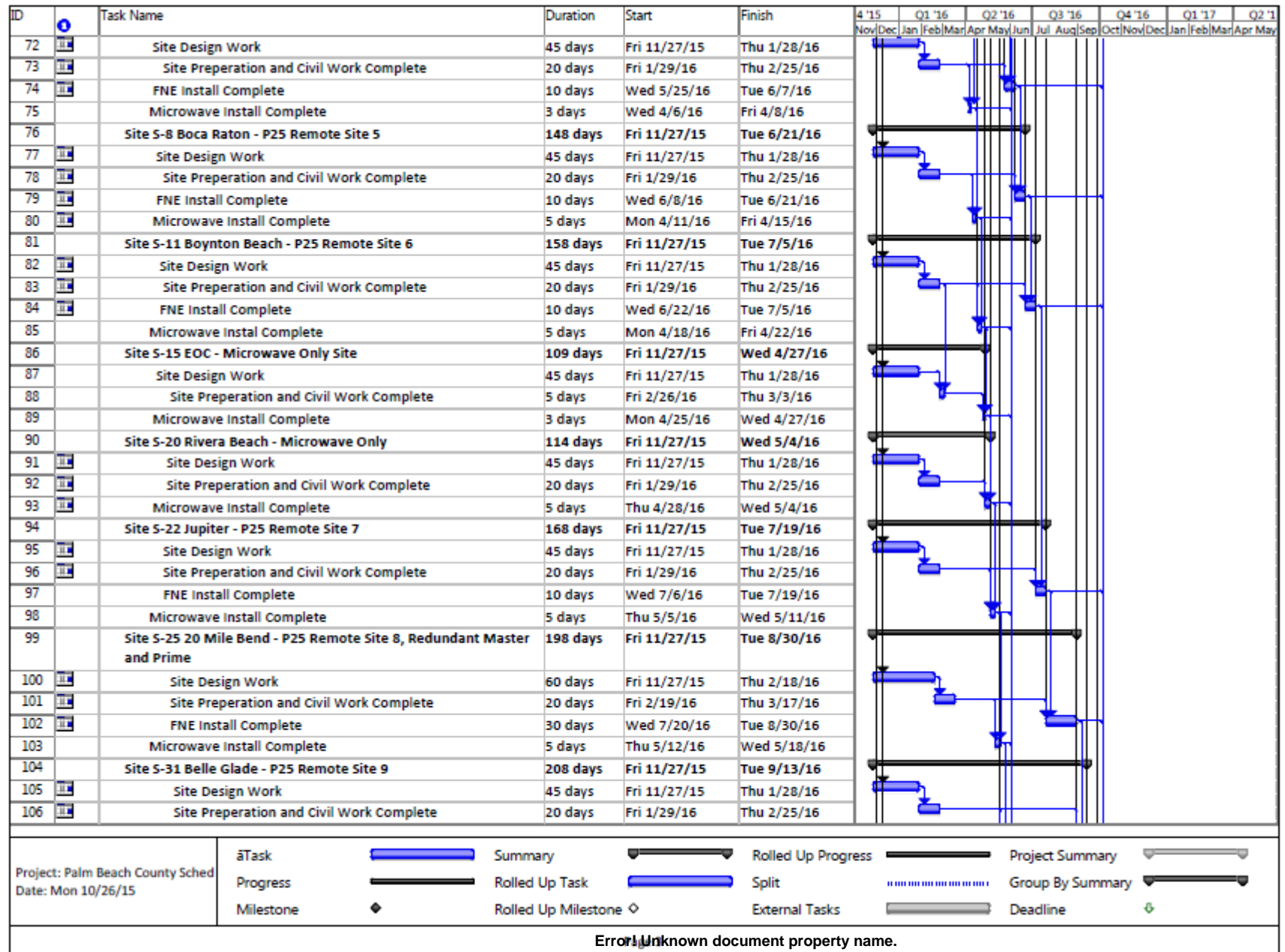




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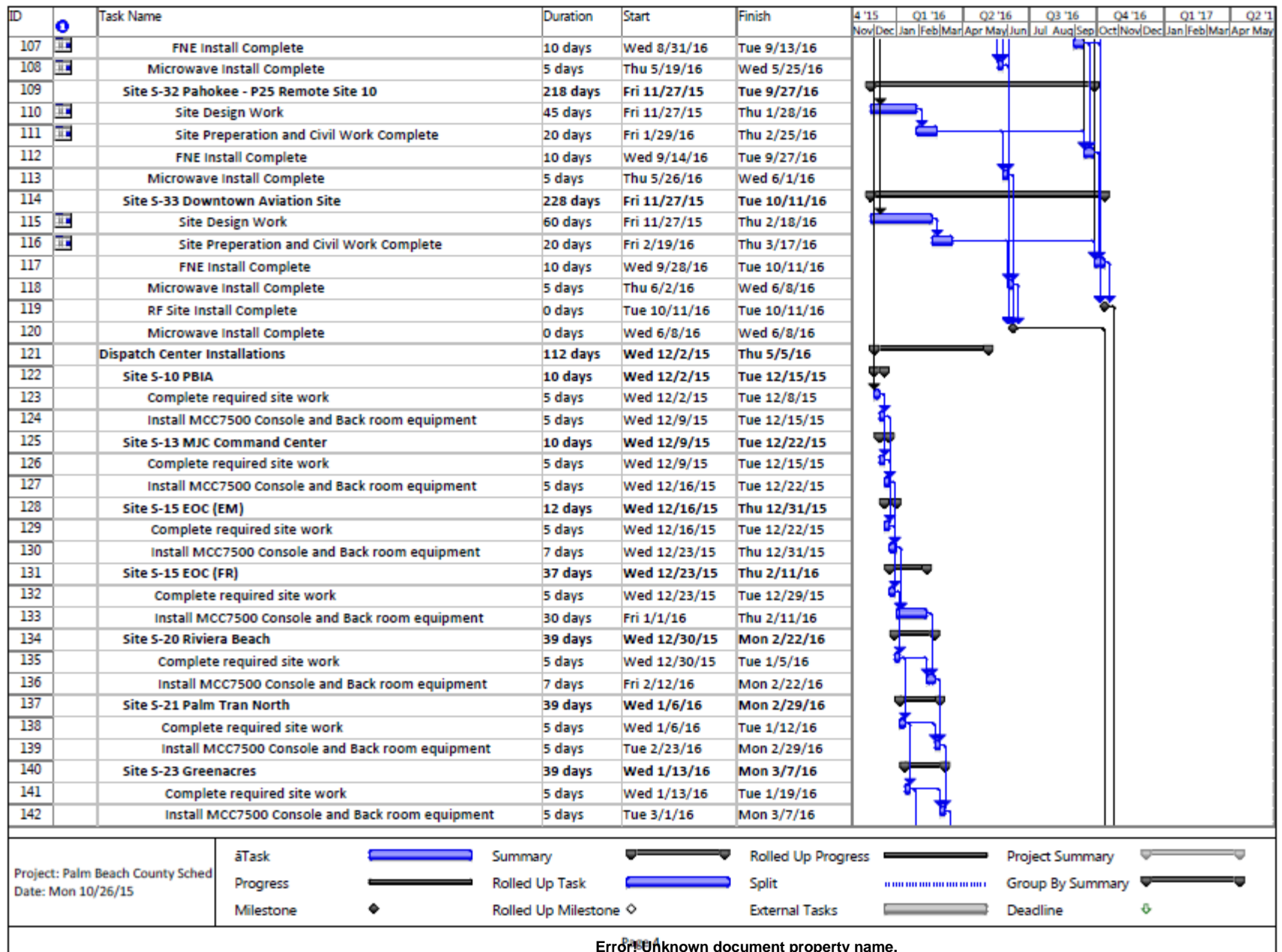




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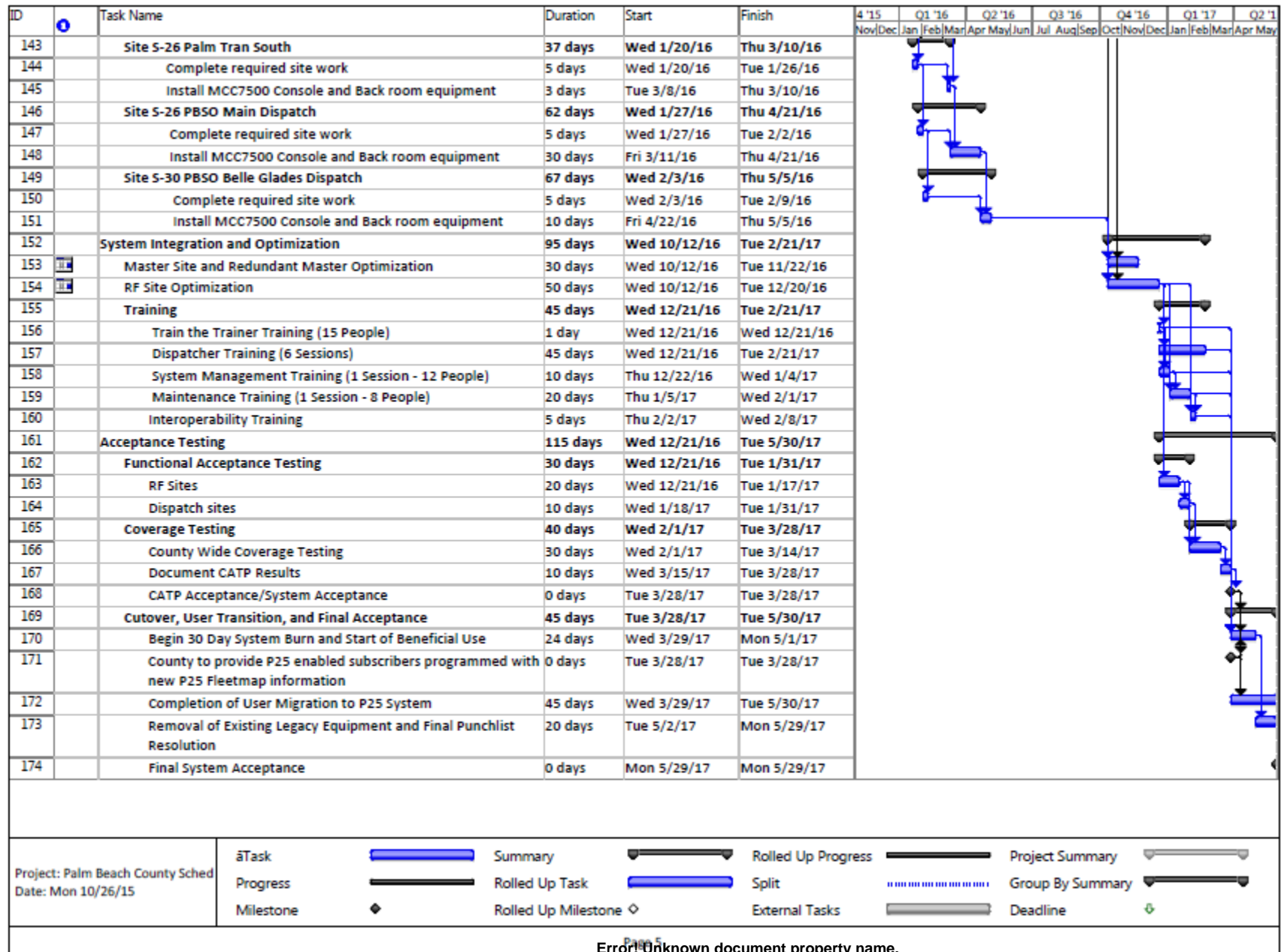
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PALM BEACH COUNTY RADIO SYSTEM



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Project Approach - NEGOTIATED C-137



Page 5
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PALM BEACH COUNTY RADIO SYSTEM



Motorola Solutions Confidential Restricted

Project Approach - NEGOTIATED C-138

7.7 Acceptance Test Plan

Provided on the following pages.



COVERAGE ACCEPTANCE TEST PLAN

Overview

This Coverage Acceptance Test Plan (CATP) is designed to verify that the voice radio system implemented by Motorola Solutions (“Motorola”) meets or exceeds the required coverage reliability within the Palm Beach County (“County”) service areas as defined by the RFP. There are five (5) service areas defined within Palm Beach County (refer to Table 6.9.1 for definition of service areas). The CATP defines the coverage testing method and procedure, the coverage acceptance criterion, the test documentation, and the responsibilities of both Motorola and the County.

Coverage acceptance testing is based upon a coverage prediction that accurately represents the implemented infrastructure and parameters that are consistent with the contract agreements. If the implemented system varies from the design parameters, then a revised coverage map will be prepared. New test maps will reflect the measured losses and gains associated with the implemented infrastructure and subscribers. These will be used to define the test configuration and potential areas from which test locations may be included in the evaluation process.

To verify that the radio coverage reliability is met, the five (5) service areas presented in the RFP will be tested. Each of the service areas tested will need to meet or exceed the area reliability for the specified service area being tested (Motorola Table B - 1).

Motorola Table B - 1 shows the predicted service area reliabilities as required by the RFP.

Motorola Table B - 1: Predicted system coverage

Service Area #	Equipment Configuration	Area Reliability of County Service Area (%)	# of Grids	Test Tile Height x Width in arc-secs
1	Portable PSM on street	≥97%	1482	21 x 23
2	Portable PSM inside 20 dB East	≥95%	626	13 x 13
3	Portable PSM inside 10 dB East	≥95%	337	15 x 15
4	Portable PSM inside 20 dB West	≥95%	576	12 x 12
5	Portable PSM inside 10 dB West	≥95%	682	8 x 8

Detailed Description of the CATP

CATP Definitions

Several definitions are needed to accurately describe the coverage test method.

Coverage Area

The coverage area is the geographical region in which communications will be provided that meets or exceeds the specified Channel Performance Criterion (CPC) at the specified reliability for the specified equipment configurations. These coverage areas are the jurisdictional boundaries of Palm Beach County and the areas defined by the RFP.



Channel Performance Criterion

The CPC is the specified minimum design performance level in a faded channel. For this system, the CPC is a Delivered Audio Quality (DAQ) of DAQ-3.4 for portables. DAQ definitions are provided in Motorola Table B - 3 {TSB-88.1-C, §5.4.2, Table 2}.

Motorola Table B - 3: DAQ definitions

DAQ	Faded Subjective Performance Description
1	Unusable, speech present but unreadable.
2	Understandable with considerable effort. Frequent repetition due to noise/distortion.
3	Speech understandable with slight effort. Occasional repetition required due to noise/distortion.
3.4	Speech understandable with repetition only rarely required. Some noise/distortion.
4	Speech easily understood. Occasional noise/distortion.
4.5	Speech easily understood. Infrequent noise/distortion.
5	Speech easily understood.

Reliability

The reliability, also defined as the CPC service area reliability, is the percentage of locations within the coverage area that meet or exceed the specified CPC. It represents the average of all tiles for the defined service area. As already described above, there are two defined service areas as outlined within the RFP. Motorola has indicated the CPC service area reliability of these areas in Motorola Table B - 2 for the losses detailed in the RFP. Although the coverage maps do not guarantee coverage within a specific location, they do indicate the ability of the system to overcome the expected losses of typical buildings located within the County and as defined by the RFP.

Equipment Configurations

There is one configurations for the field unit equipment or subscriber upon which coverage acceptance is based. Motorola's coverage maps for this system indicate the coverage area for the following equipment configurations:

1. Portable (3-watt)
 - A. Public speaker microphone
 - B. Shoulder level (5 feet for transmit and receive) with ¼ wave stubby antenna

The infrastructure that supports this configuration is the following:

- Nine (9) transmit and receive sites and one (1) receive only site.
- ASTRO[®] 25 C4FM and ASTRO[®] 25 H-CPM, which are fully Project 25 compliant.

In-Building Coverage

Motorola's coverage maps for portable in-building equipment configurations are predictions of coverage inside 20 dB loss and 10 dB buildings. The in-building coverage predictions are based on the average loss for the type of buildings, which the RFP has described. The definitions of these building types are provided in Motorola Table B - 4.

Motorola Table B - 4: Building type definitions

Building Type	Definition
Heavy (20 dB loss)	Large downtown building, large commercial building, or large enclosed



Building Type	Definition
	shopping mall
Medium (10 dB loss)	Small to medium size stores, small apartment buildings, or a small to medium sized factory or office buildings

Since building loss varies significantly depending on the construction of buildings, Motorola's coverage maps do not predict coverage within any specific building. Rather, the in-building coverage maps indicate the area within which this system is predicted to provide 95% reliability of meeting or exceeding the CPC of DAQ-3.4. Motorola will test for 95% reliability coverage within the Palm Beach County by simulating the building loss as described in the RFP. The building test will be a pass as long as there is sufficient signal to overcome 20 dB and 10 dB of loss for the specified in building service areas as described in the RFP.

CATP Method

The method used to test coverage is statistical sampling of the predicted coverage area to verify that the CPC is met or exceeded at the required reliability for each of the defined equipment configurations. It is impossible to verify every point within a coverage area, because there are infinite points; therefore, coverage reliability will be verified by sampling a statistically significant number of randomly selected locations, quasi-uniformly distributed throughout the predicted coverage area.

This CATP provides a method of tracking test tile location using Motorola Solutions' VoyagerSM hardware and software. A GPS receiver will provide location information indicating when a valid test tile is available for testing. The method follows TIA TSB-88.3-C §5.0, "Performance Confirmation" for statistical sampling.

This CATP provides an objective, quantitative method of measurement using Voyager software in conjunction with an APX 6000 (or XTS) portable radio for location reference, signal strength measurements, BER measurements, and recording.

The CATP provides a subjective audio quality test by using actual equipment and simulating the required building loss with attenuators, and then performing voice test messages to determine the pass or fail of the required DAQ-3.4 voice quality.

Determine the Required Number of Test Tiles in the Coverage Area

The predicted coverage area shown on Motorola's coverage maps and service area will be divided into a tile pattern to produce at least the number of uniformly sized test locations (or tiles) required by the Estimate of Proportions formula { TSB-88.3-C, §5.2.1, equation 2}. The minimum number of test tiles required varies for different systems, from a hundred to many thousands, depending on the size of the service area, desired confidence in results, type of coverage test, and the predicted versus required reliability. Motorola's HydraSM coverage modeling tool calculates the required test tiles as described.

Constraints on Test Tile Sizes

The minimum tile size is 100 by 100 wavelengths; however, the minimum practical test tile size is typically about 400 by 400 meters (about 0.25 by 0.25 miles). The minimum practical tile size for any system is determined by the distance traveled at the speed of the test vehicle while sampling, GPS error margin, and availability of road access within very small test tiles. A related consideration is the time, resources, and cost involved in testing very large numbers of very small tiles. The maximum test tile size is 2 by 2 kilometers (1.25 by 1.25 miles). In some wide-area



systems, this constraint on maximum tile size may dictate a greater number of test tiles than the minimum number required by the Estimate of Proportions formula.

Accessibility to Test Tiles

Prior to testing (if possible) or during the test, Motorola and the County will determine whether any test tiles are inaccessible for the coverage test (due to lack of roads, restricted land, etc.). Inaccessible tiles will be eliminated from the acceptance test calculation; however, a minimum number of test locations must be accessed to provide a statistically valid test. This is important since all valid test tiles are part of the prediction and when tiles are removed from the proof of performance testing, the area reliability accuracy could be adversely affected. TSB-88.3-C provides consideration for inaccessible test locations called “Estimated based on adjacent grids (single grids only)”. Single inaccessible test locations would be considered a “pass” if 5 of the 8 surrounding test tiles provide passing results, provided that the CATP test tiles are defined as follows:

- Only those test tiles where the majority of the tile falls within the boundaries of the CATP area under test.
- Those test tiles within the CATP boundaries that are actually tested.
- Inaccessible test tiles that are surrounded by not less than 5 contiguous test tiles which have been tested and show an actual passing result (untested test tiles are not counted).
- Any other untested test tiles that do not fit any of the criteria above (e.g., untested test tiles surrounded by other untested test tiles, or less than 5 passed test tiles, etc.) would be categorized as simply “untested” and will not be factored into the results as a “CATP tile”.

Randomly Select a Test Location within Each Tile

Using Voyager, the actual test location within each test tile will be randomly selected by the test vehicle crossing into the tile at an arbitrary point, with an arbitrary speed and direction. This will be the queue for the objective sampling test to begin. After the sample is taken for both SSI and BER, the test team will initiate the subjective voice test to determine if the test point passes the audio quality DAQ test.

Perform Measurements in Each Tile

In each test tile, a series of 200 or more sequential SSI measurements (sub-samples) will be made and approximately 17 or more sequential BER measurements also made. This test location measurement, containing a number of sub-samples, constitutes the test sample for this location. The test sample will establish the local mean and median SSI/BER within the test tile. With this measurement, the target SSI/BER for each configuration and loss is established. The distance over which the sub-samples are measured will be 40 wavelengths. A mean of multiple SSI/BER sub-samples is used rather than a single measurement to ensure that the measurement is not biased by taking a single sample that might be at a peak or null point on the radio wave.

Determine If Each Test Tile Passes or Fails the CPC Requirement

To simulate a portable with the required losses of buildings, the indicated net attenuation in Motorola Table B - 6 is used with a portable and the mobile unity gain antenna on the test vehicle. In each test tile, a voice test exchange will be initiated using predetermined text typical of a common voice exchange between the fixed location and the portable location. The person conducting the test at the portable will be moving at a typical speed for the surrounding conditions. Coverage acceptance testing will be performed in the both the talk-out and talk-in direction to determine if test tile passes or fails.



Motorola Table B - 5: Net target signal strength indication – mobile

Objective Test	Mobile Faded Sensitivity (dBm) DAQ-3.4	Measured Faded Target SSI (dBm) DAQ-3.4	Net Attenuation for Mobile Antenna Loss and Delta for Talk-in/Talk-out (dB)
Outside (FDMA)	-108.5	-108.5	0
Outside (TDMA)	-109.85	-109.85	0

Motorola Table B - 6: Net target signal strength indication – portable with PSM

Objective Test	Portable Faded Sensitivity (dBm) DAQ-3.4	Portable Faded Target SSI (dBm) DAQ-3.4	Net Attenuation for Portable Antenna and Building Loss (dB)
Outside (FDMA) 20 dB bldg	-108.5 -108.5	-105.2 -85.2	-3.3 (-7.5+4.2) ¹ -23.3 (-7.5-20.0+4.2) ¹
Outside (TDMA) 20 dB bldg	-109.85 -109.85	-106.55 -86.55	-3.3 (-7.5+4.2) ¹ -23.3 (-7.5-20.0+4.2) ¹
Outside (FDMA) 10 dB bldg	-108.5 -108.5	-105.2 -95.2	-3.3 (-7.5+4.2) ² -13.3 (-7.5-10.0+4.2) ¹
Outside (TDMA) 10 dB bldg	-109.85 -109.85	-106.55 -96.55	-3.3 (-7.5+4.2) ¹ -13.3 (-7.5-10.0+4.2) ¹

Determine the Coverage Area Reliability for Acceptance

After all accessible tiles in the coverage area have been tested; the coverage area reliability (percentage) will be determined by dividing the number of tiles that pass by the total number of tiles tested. The coverage test acceptance criterion for each equipment configuration is that the tested coverage area reliability must be equal to or greater than the required reliability as shown in Motorola Table B - 2.

Responsibilities and Preparation

This information will help set the expectations of the County and Motorola regarding requirements for equipment, personnel, and time during the coverage test.

The County will provide the following for the duration of the coverage test:

- Vehicles for the duration of the test. A minimum of two test teams would be recommended for the County area.
- Boats for testing the waterways. This can be done when the test teams finishes the drive test.

¹ The -7.5 dB is the antenna loss figure for the APX (or XTS) portable at shoulder level. The +4.2 dB is the mobile antenna and transmission line that a portable does not have and thus must be added back to get the signal at the input to the test radio.

² The -7.5 dB is the antenna loss figure for the APX (or XTS) portable at shoulder level. The +4.2 dB is the mobile antenna and transmission line that a portable does not have and thus must be added back to get the signal at the input to the test radio.



- Aircraft for air testing. This can be done when the test teams finishes the drive test.
- Two County representatives (one can be an RCC representative) for each test vehicle to be the customer representatives for each of the field test teams.
- Two County representatives (one can be an RCC representative) for the fixed location (likely the dispatch center) to be the customer representatives for the fixed end.

Motorola will provide the following for the duration of the coverage test:

- At least two Motorola representative to operate Voyager for each team (this would assume that the customer representative would drive the vehicle).
- At least two calibrated Motorola Voyager coverage testing package per team.
- Test radios for each field team (unless required otherwise, use the delivered customer subscribers).

Coverage acceptance testing will be performed within the borders of Palm Beach County. Motorola has determined the minimum number of test tiles required, as described in Table B-2 of this CATP. Motorola and the County will plan the route for the test vehicles through the coverage test area, to ensure that at least the minimum required number of tiles is tested. If possible, any tiles not accessible to the test vehicles will be identified while planning the route.

Motorola will check and/or calibrate the test radios (standard APX 6000 portables) used with the Voyager coverage testing package in the County's presence.

Motorola will conduct this test only once. If any portion of the test is determined to be unreliable because of proven equipment malfunctions or failures, Motorola will repeat the portion of the test affected by the equipment malfunction or failure. The County will have the option to accept the coverage at any time prior to completion of the coverage test.

Before starting the test, the County and Motorola will agree upon the time frame for Motorola's submission of a report containing the coverage test results.

CATP Procedures

Subjective Voice Quality Testing

A subjective listening test will be performed for coverage acceptance testing to verify talk-out and talk-in DAQ performance of the system for FDMA and TDMA.

The procedure for the subjective DAQ coverage test will be as follows:

- To perform a statistically valid subjective DAQ test, a large group of people is required to ensure high confidence in the results. However, obtaining a large group of people for a subjective listening test is usually impractical; therefore, several (3 to 7) people in a car or van must be used for the test. Since a group this small cannot provide statistically significant results, it is very important that the personnel participating in the subjective test be familiar with the sound of radio conversations. Before subjectively testing, all personnel who will evaluate audio quality must be "calibrated" by listening to examples of static and faded audio of various CPC levels from the type of system being tested.



- A fixed control point location will be established. Prior to testing, the County and Motorola will agree upon a procedure to allow each audio transmission to be evaluated for approximately 8 to 20 seconds.
- The test participants will be divided into teams, each consisting of personnel from the County, RCC, and Motorola. Each team will have members that operate a portable unit inside the test vehicle and members that are stationed at the fixed control point location. An odd number of team members is required to avoid ties for the pass/fail consensus.
- As the field test team(s) drive through the coverage area, test locations within each tile will be selected randomly by Voyager that will be conducting the objective SSI and BER testing. The voice subjective test may begin after the sampling is complete. This is to prevent any degradation to the receiver sampling the SSI/BER and to meet the TSB88 requirement of a randomly selected test point.
- The field test unit will make a call and identify the test tile by the current x-y tile or tile cell number location and repeat one of ten phonetically balanced phrases (approximately 8 seconds in length). The fixed location unit (console or control station) test team will then determine if the voice passes or fails the DAQ criteria as defined by Motorola Table B - 3. The fixed location will then repeat 1 of the 10 phonetically balanced phrases (approximately 8 seconds in length) and the field team will in turn determine if the voice passes or fails the DAQ criteria.
- The tile pass/fail evaluations will be used to determine the coverage area reliability of the defined coverage areas in Motorola Table B - 2.
- Coverage acceptance will be based on demonstrating that the percentage of the tile locations, as described in Motorola Table B - 2 for each equipment configuration will provide an audio quality of DAQ-3.4 or better. The system coverage acceptance criterion will be the successful passing of each of the equipment configurations.
- Motorola reserves the right to review any test tiles that fail the subjective DAQ tests.
- If a coverage test, or a portion thereof, is suspected by Motorola to have failed due to external interference, those tiles suspected of being affected by an interferer may be re-tested. If the tiles (or test points) re-tested are confirmed to have failed due to interference, those tiles (or test points) will be excluded from all acceptance calculations and Motorola will work with Palm Beach County to identify potential solutions to the interference issues.

Objective SSI and BER Testing

Motorola will conduct attenuated voice subjective testing for the area reliabilities as shown in Motorola Table B - 2 for a pass/fail test. Both the subjective and objective testing as described would be performed at the same time but evaluated independently of each other. A tile that tests below the target SSI and/or BER for the objective test point would not constitute a failure for the subjective testing. The reason for this is that the points are taken at different times (thus at different locations). The modeling does not predict the probability of one location against the other but predicts area reliability of all test points for each test within the test area.



CATP Documentation and Coverage Acceptance

During the coverage acceptance test, Voyager generates computer files that include the mean and median SSI and BER for each test tile. It also generates a comma separated values (.csv) file that documents these samples for each test point taken. A copy of this data will be provided to the County or RCC at any time during the test or as required.

Motorola will process this data to determine whether the coverage test was passed for the equipment configurations and to produce a map that graphically displays the statistical coverage test results along with the analyzed numbers of the passes and failures.

Motorola will submit to the County a report detailing the coverage test results. This report will include a document, which is to be signed by both the County and Motorola, indicating the test was performed in accordance with this CATP and the results of the test indicate the acceptance or non-acceptance of the coverage portion of the system. The County will have the option to accept the coverage at any time prior to completion of the coverage test or documentation process.



Mobile/Portable Equipment Checklist

Vehicle Make:	_____	Radio Serial No.:	_____
Vehicle Type:	_____	Radio Network ID:	_____
Vehicle No.:	_____	Date:	_____
Service Shop:	_____	Technician:	_____

Note: A failure of any preliminary check will cause rejection, and the vehicle will be returned for correction before continuing the testing and installation.

	Pass	Fail
Battery Visual		
1. Broken or Cracked Case	_____	_____
2. Broken or Cracked Cover	_____	_____
3. Acidic Odor	_____	_____
4. Excessive Corrosion on Battery Posts	_____	_____
5. Battery Posts Tight	_____	_____
Wiring Visual	Pass	Fail
Wires Pinched or Damaged	_____	_____
6. Wires Running Over Hot or Moving Parts	_____	_____
7. Condition of Battery Ground	_____	_____
8. Condition of Battery to Hot Lead	_____	_____
9. Wires Run Through Firewall (grommet installed)	_____	_____
Radio Check	Pass	Fail
Radio Mounted Securely	_____	_____
10. Antenna Type (unity, 3 dBq, etc.)	_____	_____
11. Antenna Line Type and Length	_____	_____
12. Antenna Installed Correctly	_____	_____
13. Antenna Length Correct	_____	_____
14. Tx Power Forward	_____	_____
15. Tx Power Reverse ($\leq 4\%$ of Forward Power)	_____	_____
16. VSWR ($< 1.5:1$)	_____	_____
17. Tx Deviation	_____	_____
18. Tx Frequency	_____	_____
19. Rx Sensitivity	_____	_____
20. Effective Receiver Sensitivity Degradation (refer to the Systems Engineer for maximum allowable degradation)	_____	_____
Radio Software Check	Pass	Fail
Verify the hardware revision and model/and serial numbers (include an archive file with the software release version and personality parameters)	_____	_____
Comments:		

ASTRO 25 RELEASE 7.16 FATP AND SATP

In-Plant Draft

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MCC 7100/7500 CONVENTIONAL RESOURCES FATP AND SATP

7.7.1 Alert Tones - Conventional Channel

1. DESCRIPTION

Pre-defined alert tones can be transmitted on the selected Radio Resource to subscribers which can alert members of a channel / talkgroup to a particular event or signify to radio users special instructions are to follow. The Console has the ability to send an Alert-Tone signal on selected conventional or talkgroup resources.

SETUP

RADIO-1 - CONVENTIONAL CHANNEL 1
RADIO-2 - CONVENTIONAL CHANNEL 1
CONSOLE-1 - CONVENTIONAL CHANNEL 1

VERSION #1.030

2. TEST

- Step 1. Select CONVENTIONAL CHANNEL 1 on CONSOLE-1.
- Step 2. Select Alert Tone 1 and depress the Alert Tone button.
- Step 3. Verify that RADIO-1 and RADIO-2 hear Alert Tone 1.
- Step 4. Repeat Steps 2-3 for Alert Tone 2 and 3.

Pass_____ Fail_____



7.7.2 Console Priority

1. DESCRIPTION

Console Operator Positions have ultimate control of transmitted audio on an assigned resource. The Console Position has the capability to take control of an assigned voice channel for a channel/talkgroup call so that the operator's audio overrides any subscriber audio. Console priority is a feature that enables dispatchers to gain immediate access to an assigned voice channel so that a central point of audio control exists.

SETUP

RADIO-1 - CONVENTIONAL CHANNEL 1

RADIO-2 - CONVENTIONAL CHANNEL 1

CONSOLE-1 - CONVENTIONAL CHANNEL 1

VERSION #1.040

2. TEST

- Step 1. Initiate a call from RADIO-1 on CONVENTIONAL CHANNEL 1. Keep this call in progress until the test has completed.
- Step 2. Observe that RADIO-2 receives the call.
- Step 3. While the call is in progress, key up CONSOLE-1 on CONVENTIONAL CHANNEL 1.
- Step 4. Observe that RADIO-2 is now receiving audio from CONSOLE-1 on CONVENTIONAL CHANNEL 1
- Step 5. De-key CONSOLE-1.
- Step 6. Verify RADIO-2 now receives RADIO-1 audio.
- Step 7. End the CONVENTIONAL CHANNEL 1 call from RADIO-1.

Pass____ Fail____

7.7.3 Conventional Call - Analog (Using a Test Set)

1. DESCRIPTION

A conventional station can be integrated into a trunking system by placing a conventional resource on the consoles. This allows the user to dispatch and patch the conventional station with the desired talkgroups.

This test will demonstrate the audio output at the Conventional Channel GateWay (CCGW) using a test set in those cases where the attached device is not available.

SETUP

CONSOLE-1 - CONVENTIONAL CHANNEL 1 and
CONVENTIONAL CHANNEL 2

Connect a transmission test set to the port that corresponds to CONVENTIONAL CHANNEL 1 in the Console Position.

Note: Each RJ45 receptacle on the Analog Module of the Conventional Channel GateWay (CCGW) represents a possible resource, pins 1 and 2 are for RX audio, and pins 4 and 5 are for TX audio.

VERSION #1.030

2. TEST

- Step 1. Connect a transmission test set to the output of the port corresponding to CONVENTIONAL CHANNEL 1 on CONSOLE-1.
- Step 2. Using CONSOLE-1, initiate a call on CONVENTIONAL CHANNEL 1 and verify Transmit audio is heard through the transmission test set.
- Step 3. Using the test set, inject a test tone into the input of CONVENTIONAL CHANNEL 1.
- Step 4. Verify the CONVENTIONAL CHANNEL 1 resource receives the tone in the appropriate speaker.
- Step 5. Connect a transmission test set to the output of the port corresponding to CONVENTIONAL CHANNEL 2 on CONSOLE-1.
- Step 6. Using CONSOLE-1, initiate a call on CONVENTIONAL CHANNEL 2 and verify Transmit audio is heard through the transmission test set.
- Step 7. Using the test set, inject a test tone into the input of CONVENTIONAL CHANNEL 2.
- Step 8. Verify the CONVENTIONAL CHANNEL 2 resource receives the tone in the appropriate speaker.

Pass_____ Fail_____

7.7.4 Frequency Selectable Conventional Resource

1. DESCRIPTION

A Resource is selected on the console by placing the cursor over the Resource, choosing an area and selecting. The Resource choice area is the region where the name of the Resource is located (Top alphanumeric line of the Resource). When selected, the background of the Radio Resource will turn white and the border will turn green. Choosing the Instant Transmit button will send keying commands to the station.

The Frequency Select option provides the capability to choose up to 16 separate frequencies.

SETUP

RADIO-1 - CONVENTIONAL CHANNEL 1

CONSOLE-1 - CONVENTIONAL CHANNEL 1

VERSION #1.020

2. TEST

- Step 1. Using CONSOLE-1, select the first frequency in the list for the resource.
- Step 2. Select the corresponding frequency on RADIO-1.
- Step 3. Verify communications between CONSOLE-1 and RADIO-1.
- Step 4. Using CONSOLE-1, select another frequency in the list for the resource.
- Step 5. Select the corresponding frequency on RADIO-1.
- Step 6. Verify communications between CONSOLE-1 and RADIO-1.

Pass_____ Fail_____

7.7.5 Patch Operation - Conventional

1. DESCRIPTION

The Patch feature allows more than one Radio Resource to be grouped simultaneously. This can be used for temporarily merging two or more channels/frequencies together to act as one larger group. Telephones and radio resources can be patched together. In a patch group, the members can receive messages from the console and they can transmit to all other members of the patch group.

SETUP

RADIO-1 - CONVENTIONAL CHANNEL 1
RADIO-2 - CONVENTIONAL CHANNEL 2
CONSOLE-1 - CONVENTIONAL CHANNEL 1 and
CONVENTIONAL CHANNEL 2

VERSION #1.020

2. TEST

- Step 1. Select the tab for patch 1, 2 or 3. Verify that the patch edit button and patch transmit button appear.
- Step 2. Select the "Patch Edit" icon. The selected patch will turn blue.
- Step 3. Select the CONVENTIONAL CHANNEL 1 and CONVENTIONAL CHANNEL 2 Radio Resource by moving the cursor over the Radio Resources' names and selecting them.
- Step 4. Verify that the selected Radio Resources display a "Patch Edit" icon.
- Step 5. Press and hold the "Patch Transmit" icon to initiate the patch transmission.
- Step 6. Verify that the RADIO-1 and RADIO-2 monitor the console outbound audio.
- Step 7. Verify that RADIO-1 can communicate with RADIO-2 even though they are on separate channels.
- Step 8. To knock down the patch, select the Radio Resources by moving the mouse cursor over the resource window and clicking over the patch icon. Repeat this process until all the resources have been removed from the Patch window.
- Step 9. Select the Patch Edit icon and idle the current patch.

Pass____ Fail____

7.7.6 Tone Generation on Conventional Resource

1. DESCRIPTION

This test will demonstrate that the dispatch console is able to transmit on a conventional resource during the tone generation period.

SETUP

RADIO-1 - CONVENTIONAL CHANNEL 1

CCGW-1 - CONVENTIONAL CHANNEL 1
CCGW-1 - SITE 1

CONSOLE-1 - CONVENTIONAL CHANNEL 1
CONSOLE-1 - SITE - CONSITE 1

(Note: Use General Transmit by keying up CONVENTIONAL CHANNEL 1 via console microphone or footswitch)

VERSION #1.040

2. TEST

- Step 1. Send an Alert tone from CONSOLE-1, followed by a voice announcement.
- Step 2. Verify that RADIO-1 hears Alert tone from CONSOLE-1
- Step 3. Verify that RADIO-1 hears audio from CONSOLE-1 during the Alert Tone Talk Extend period.

Pass_____ Fail_____

MCC 7100/7500 TRUNKED RESOURCES FATP AND SATP

7.7.7 Instant Transmit

1. DESCRIPTION

The instant transmit switch provides immediate operator access to a channel, independent of its select status (selected or unselected). It provides priority over other dispatcher transmit bars or optional footswitches.

SETUP

RADIO-1 - TALKGROUP 1
CONSOLE-1 – TALKGROUP 1 (Selected),
TALKGROUP 2 (Unselect mode)

VERSION #1.010

2. TEST

- Step 1. Using CONSOLE-1, press the Instant Transmit button on TALKGROUP 1.
- Step 2. Verify that the Transmit indicator is lit.
- Step 3. Verify RADIO-1 can monitor and respond to the call on TALKGROUP 1.
- Step 4. On RADIO-1 change to TALKGROUP 2.
- Step 5. Using CONSOLE-1, press the Instant Transmit button on the TALKGROUP 2 radio resource.
- Step 6. Verify RADIO-1 can monitor and respond to the call on TALKGROUP 2.

Pass_____ Fail_____



MCC 7100/7500 Trunked Resources

7.7.8 Activity Log

1. DESCRIPTION

The Console activity log will show all traffic for the resource assigned to that console to include the time, radio alias, TG, PTT ID and Emergency Call.

The dispatcher has the capability of selecting a logged call within in the "Activity Log Window" for instant transmit on the corresponding logged resource.

This activity log can be logged to a text file for archival purposes.

Note: The log file in the ops will only be seen if you first check Log Activity in Elite Admin application then in folder options uncheck hide hidden system files. The location will be c:\Program Data\MCC7500\MessageMonitorLogs.

SETUP

RADIO-1 – TALKGROUP 1
RADIO-2 – TALKGROUP 2
RADIO-3 – TALKGROUP 3
RADIO-4 – TALKGROUP 4
CONSOLE-1 – TALKGROUP 1, TALKGROUP 2,
TALKGROUP 3, TALKGROUP 4

VERSION #1.020

2. TEST

- Step 1. On CONSOLE-1 select the "Show Activity Log" button on the tool bar to open the Activity Log Window.
- Step 2. Initiate calls on RADIO-1, RADIO-2, RADIO-3 and RADIO-4 to log call information and verify calls are displayed in the activity log window.
- Step 3. Select a logged call in the Activity Log Window and verify that the Channel Control Window (CCW) at the top of the Activity log window changes to the corresponding resource. Verify the dispatcher is capable of responding via the instant transmit button.
- Step 4. Open the text file created by the Activity Log and verify call traffic has been archived to the document file.

Pass____ Fail____



7.7.9 Alarm Input / Outputs (Aux I/O Option)

1. DESCRIPTION

The alarm inputs of the Aux I/O can be connected to almost any device that requires or can detect a relay closure. These signals can be simulated and monitored in the factory.

SETUP

Connect a multi-meter capable of monitoring closures to the proper pins of the punch block cabled to the Aux I/O. One momentary input and one momentary output should be configured on at least one MCC 7100/7500 console.

CONSOLE-1 - TALKGROUP 1

CONSOLE-1 - SITE - CONSITE 1

Aux I/O punch block pinout:

Aux I/O 1 - pins 26,1

Aux I/O 2 - pins 27,2

Aux I/O 3 - pins 28,3

Aux I/O 4 - pins 29,4

VERSION #1.010

2. TEST

- Step 1. Using a shorting wire, simulate a relay closure on an input via the punch block.
- Step 2. Verify that CONSOLE-1 momentary input displays the icon designated for an ON_STATE.
- Step 3. Remove the shorting wire and verify that CONSOLE-1 displays the icon designated for an OFF_STATE.
- Step 4. Connect the meter to the pins to monitor a relay output.
- Step 5. Verify that the meter reads an open circuit.
- Step 6. Press the output button on the console to initiate a relay closure.
- Step 7. Verify that the meter displays a closed circuit.

Pass_____ Fail_____

MCC 7100/7500 Trunked Resources

7.7.10 Call Alert

1. DESCRIPTION

Call Alert Page allows a subscriber/dispatcher to selectively alert another radio unit. The initiating subscriber/console will receive notification as to whether or not the call alert was received. Units receiving a Call Alert will sound an alert tone and show a visual alert indication. The display will also show the individual ID of the initiating subscriber/console unit.

SETUP

RADIO-1 - TALKGROUP 1
CONSOLE-1 - TALKGROUP 1

VERSION #1.030

2. TEST

- Step 1. Using CONSOLE-1, select the call alert button in the "Private Call" resource window.
- Step 2. Enter the ID of RADIO-1 and send the call alert to RADIO-1.
- Step 3. Verify that RADIO-1 receives the alert and that the ID or alias of the console is shown.
- Step 4. Turn off RADIO-1.
- Step 5. Using CONSOLE-1, send the call alert to RADIO-1 again.
- Step 6. Verify that after trying to page RADIO-1, the console displays "Can not send call alert - target not found" in the summary/status list.

Pass____ Fail____



7.7.11 Channel Marker

1. DESCRIPTION

A Channel Marker is a distinct, short duration, audible tone over radio and Console speakers. The tone is initiated and cancelled by a console operator. The tone can be initiated only for the talkgroups or conventional channels. On initiation, it is generated periodically when there is no voice activity. The tone can be used for various purposes. The primary purpose of the tone is to inform radio users that the conventional channel or the trunked talkgroup is currently involved in a high priority situation and they should stay off the channel unless they are involved in the high priority situation. The tone also informs the users that a console operator is actively monitoring the talkgroup.

Note that the Channel Marker tone will only start when there is no voice activity for the selected Talkgroup or conventional channel. The channel Marker tone is sent in a current transmission mode of the Console user.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 1
CONSOLE-1 - TALKGROUP 1
CONSOLE-2 - TALKGROUP 1

VERSION #1.010

2. TEST

- Step 1. Initiate a Channel Marker tone on TALKGROUP 1 from CONSOLE-1.
- Step 2. Verify RADIO-1 and RADIO-2 can monitor the Channel Marker tone on TALKGROUP 1.
- Step 3. Verify CONSOLE-1 and CONSOLE-2 also monitor the Channel Marker tone on TALKGROUP 1.
- Step 4. Initiate a call from RADIO-1 and continue to key longer than the preset Channel Marker tone period for TALKGROUP 1.
- Step 5. Verify while RADIO-1 is keyed, the Channel Marker tone is suppressed.
- Step 6. Verify after RADIO-1 de-keys, the periodic Channel Marker tone continues to be transmitted on TALKGROUP 1.
- Step 7. Cancel the Channel Marker on TALKGROUP 1 from CONSOLE-1.
- Step 8. Verify the Channel Marker is no longer monitored on TALKGROUP 1.

Pass____ Fail____

MCC 7100/7500 Trunked Resources

7.7.12 Channel Control Volume

1. DESCRIPTION

The Channel Control Volume feature ensures that dispatchers do not accidentally turn the audio volume of a radio resource on their dispatch positions down so low that they can't hear it. This feature maintains a configured lower limit for the resources volume setting.

This test can be run on MCC7100 and MCC7500 consoles.

This test can be run on Analog, MDC-1200, Digital, or Mixed Mode conventional resources. This test can also be run on Trunking resources.

SETUP

On CONSOLE-1 configure TALKGROUP 1 to have a minimum volume level of 4.

RADIO-1 – TALKGROUP 1

CONSOLE-1 - TALKGROUP 1

VERSION #1.020

2. TEST

- Step 1. Select the TALKGROUP 1 Resource window on CONSOLE-1.
- Step 2. Initiate a TALKGROUP 1 call using RADIO-1.
- Step 3. Observe that RADIO-1's audio comes out from the SELECT speaker of CONSOLE-1 in full volume.
- Step 4. Try to adjust TALKGROUP 1's volume to its lowest level by means of the mouse.
- Step 5. Observe that the volume level is not allowed to go lower than the configured minimum level and that the audio in the select speaker is lower in volume, but can still be heard.

Pass_____ Fail_____



7.7.13 Console Initiated Private Call to Subscriber

1. DESCRIPTION

Private Conversation is a selective calling feature which allows a dispatcher or radio user to carry on one-to-one conversation that is heard only by the two parties involved. Subscriber units receiving a private call will sound an alert tone. As with other call types, Private Calls operate across sites as well as within the same site.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 1
CONSOLE-1 - TALKGROUP 1

VERSION #1.020

2. TEST

- Step 1. Using CONSOLE-1, select the "PRIVATE-CALL" tile and click the Private Call function.
- Step 2. Select the unit to be Private Called, in this case RADIO-1. (or select the numeric keypad and enter the Unit ID to be Private Called.)
- Step 3. Click the Send button.
- Step 4. Answer the Private Call with RADIO-1 and respond to the console.
- Step 5. Verify RADIO-2 does not hear the private conversation.
- Step 6. After completing the Private Call, return to the normal talkgroup mode.

Pass____ Fail____

7.7.14 Console Initiated Secure Private Call to Subscriber

1. DESCRIPTION

Private Conversation is a selective calling feature that allows a dispatcher or radio user to carry on one-to-one conversation that is heard only by the two parties involved. The test will demonstrate the ability to initiate/receive secure private calls by the Console/Radio.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 1
CONSOLE-1 - TALKGROUP 1

VERSION #1.030

2. TEST

- Step 1. Using CONSOLE-1, select the "PRIVATE-CALL" tile, set it to the secure mode at and click the Private Call function.
- Step 2. Select the unit to be Private Called, in this case RADIO-1. (or select the numeric keypad and enter the Unit ID to be Private Called.)
- Step 3. Click the Send button.
- Step 4. Answer the Private Call with RADIO-1 and respond to the console.
- Step 5. Verify RADIO-2 does not hear the private conversation.
- Step 6. After completing the Private Call, return to the normal talkgroup mode.

Pass____ Fail____

MCC 7100/7500 Trunked Resources

7.7.15 Console Initiated Private Call to a Console

1. DESCRIPTION

Private Conversation is a selective calling feature that allows a dispatcher or radio user to carry on one-to-one conversation that is heard only by the two parties involved. Subscriber units receiving a private call will sound an alert tone. As with other call types, Private Calls operate across sites as well as within the same site. MCC 7100/7500 Console can use the feature to communicate with another MCC 7100/7500 Console in the same or another Console Site.

Private call between the two Consoles is supported for MCC 7100/7500 Consoles only.

SETUP

RADIO-1 - TALKGROUP 1
CONSOLE-1 - TALKGROUP 1
CONSOLE-2 - TALKGROUP 1
CONSOLE-3 - TALKGROUP 1

VERSION #1.010

2. TEST

- Step 1. Using CONSOLE-1, select the "PRIVATE-CALL" tile and click the Private Call function.
- Step 2. Select the numeric keypad.
- Step 3. Using the displayed keypad enter the unit ID to be Private Called (CONSOLE-2) or select CONSOLE-2 from the drop down list (if listed).
- Step 4. Click the Send button.
- Step 5. At CONSOLE-2, answer the Private Call from CONSOLE-1 and verify CONSOLE-2 is able to hear the CONSOLE-1 audio. Also verify that the CONSOLE-1 can hear the CONSOLE-2 audio.
- Step 6. Verify that RADIO-1 and CONSOLE-3 do not hear the audio for the Private Call.
- Step 7. Verify that no site resources are used as this is an IP based call from Console user to Console user.
- Step 8. End the Private Call.

Pass____ Fail____



7.7.16 Console Priority

1. DESCRIPTION

Console Operator Positions have ultimate control of transmitted audio on an assigned voice channel resource. The Console Position has the capability to take control of an assigned voice channel for a talkgroup call so that the operator's audio overrides any subscriber audio. Console priority is a feature that enables dispatchers to gain immediate access to an assigned voice channel so that a central point of audio control exists.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 1
CONSOLE-1 - TALKGROUP 1

VERSION #1.020

2. TEST

- Step 1. Initiate a Talkgroup call from RADIO-1 on TALKGROUP 1. Keep this call in progress until the test has completed.
- Step 2. Observe that RADIO-2 receives the call.
- Step 3. While the call is in progress, key up CONSOLE-1 on TALKGROUP 1.
- Step 4. Observe that RADIO-2 is now receiving audio from CONSOLE-1 on TALKGROUP 1.
- Step 5. De-key CONSOLE-1.
- Step 6. Verify RADIO-2 now receives RADIO-1 audio.
- Step 7. End the TALKGROUP 1 call from RADIO-1.

Pass_____ Fail_____

7.7.17 Console Tactical/Normal Priority

1. DESCRIPTION

The Tactical/Normal Priority feature is initiated at the console operator position and provides the dispatcher with the ability to change the priority for a particular talkgroup. When selected, a higher priority level (level 2) is assigned to the talkgroup. This overrides the priority level set in the system manager. Only emergency calls have a higher priority than tactical.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 2
RADIO-2 - SITE - SITE 1
RADIO-3 - TALKGROUP 3
RADIO-3 - SITE - SITE 1
RADIO-4 - TALKGROUP 1
RADIO-4 - SITE - SITE 1
RADIO-5 - TALKGROUP 2
RADIO-5 - SITE - SITE 1
RADIO-6 - TALKGROUP 3
RADIO-6 - SITE - SITE 1
RADIO-7 - TALKGROUP 4 (If testing with TDMA mode)
RADIO-7 - SITE - SITE 1
CONSOLE-1 - TALKGROUP 1, TALKGROUP 2, and TALKGROUP 3

Note: The priority level for the talkgroups selected should be the same.

VERSION #1.030

2. TEST

- Step 1. Simulate a busy system by disabling all voice paths except for one at SITE 1. (If this is a TDMA site, it will be necessary to have a call in progress with RADIO-7 for the duration of the test.)
- Step 2. Initiate a Talkgroup Call with RADIO-1 and observe it is received by RADIO-4. Keep this call in progress until instructed to end the call.
- Step 3. Key RADIO-2 and observe that the radio receives a busy. Key RADIO-3 and observe that the radio receives a busy.
- Step 4. End the talkgroup call established in step 2. Verify RADIO-2 receives the first callback and make a call to RADIO-5 upon receipt of the callback indication.
- Step 5. End the call between RADIO-2 and RADIO-5. Verify that RADIO-3 receives a call back and is able to communicate with RADIO-6.
- Step 6. Enable Tactical Priority for TALKGROUP 3 from CONSOLE-1. Initiate a Talkgroup Call with RADIO-1 and observe that it is received by RADIO-4. Keep this call in progress until instructed to end the call.
- Step 7. Key RADIO-2 and observe that the radio receives a busy then key RADIO-3 and observe that the radio receives a busy.
- Step 8. End the Talkgroup Call established by RADIO-1. Verify RADIO-3 now receives the first callback and is able to communicate with RADIO-6.
- Step 9. End the call between RADIO-3 and RADIO-6. Verify that RADIO-2 receives a call back and is able to communicate with RADIO-5.
- Step 10. Disable Tactical Priority for TALKGROUP 3.

Pass____ Fail____

7.7.18 Emergency Alarm and Call Display Description

1. DESCRIPTION

Users in life threatening situations can use the emergency button on the radio to send an audible alarm and a visual alarm signal to a console operator in order to request immediate system access to a voice channel for an emergency call. An emergency alarm begins after the radio user presses the radio's emergency button. Pressing the emergency button places the radio in "emergency mode". To begin an emergency call, the radio user must press the radio's PTT button while in "emergency mode." The assigned voice channel will be dedicated to the emergency caller's talkgroup for an extended period of time, equal to the Message Hang Time plus the Emergency Hang Time. As with other call types, emergency calls can operate across sites as well as within the same site.

SETUP

RADIO-1 - TALKGROUP 1
CONSOLE-1 - TALKGROUP 1
CONSOLE-2 - TALKGROUP 1

VERSION #1.010

2. TEST

- Step 1. Initiate an Emergency Alarm from RADIO-1.
- Step 2. Observe the Emergency from RADIO-1 is received at CONSOLE-1 for TALKGROUP 1.
- Step 3. Acknowledge the Emergency at the operator position. Verify CONSOLE-2 receives notification that the call has been acknowledged.
- Step 4. Initiate a call with RADIO-1 to initiate an Emergency call.
- Step 5. Observe CONSOLE-1 and CONSOLE-2 can monitor RADIO-1
- Step 6. Clear the Emergency from CONSOLE-1 on TALKGROUP 1.
- Step 7. End the Emergency Alarm from RADIO-1.

Pass____ Fail____

MCC 7100/7500 Trunked Resources

7.7.19 Alert Tones - Talkgroup

1. DESCRIPTION

Pre-defined alert tones can be transmitted on the selected Radio Resource to subscribers which can alert members of a channel / talkgroup to a particular event or signify to radio users special instructions are to follow. The Console has the ability to send an Alert-Tone signal on selected conventional or talkgroup resources.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 1
CONSOLE-1 - TALKGROUP 1

VERSION #1.040

2. TEST

- Step 1. Select TALKGROUP 1 on CONSOLE-1.
- Step 2. Select Alert Tone 1 and depress the Alert Tone button.
- Step 3. Verify that RADIO-1 and RADIO-2 hear Alert Tone 1.
- Step 4. Repeat Steps 2-3 for Alert Tone 2 and 3.

Pass____ Fail____



MCC 7100/7500 Trunked Resources

7.7.20 Instant Recall Recorder (IRR) Operation

1. DESCRIPTION

The Instant Recall Recorder (IRR) allows for audio from a phone call or a radio call to be played back at the MCC 7500 or MCC 7100 Console position. Thirty minutes of audio is saved for radio and an additional thirty minutes for telephone. The audio is saved on the positions hard disk in the form of a .wav file.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 1

CONSOLE-1 - TALKGROUP 1 running IRR application.

VERSION #1.020

2. TEST

- Step 1. Select a radio channel on the CONSOLE-1 application window.
- Step 2. Select IRR from the CONSOLE-1 toolbar.
- Step 3. Initiate radio communication between RADIO-1 and RADIO-2.
- Step 4. Verify a new entry appears in the IRR log window.
- Step 5. Select the new entry from the list.
- Step 6. Press play and verify conversation replay.

Pass____ Fail____



7.7.21 Multi-Select Operation

1. DESCRIPTION

Multi-Select (Msel) allows the console operator to group a number of channels/talkgroups together such that when the general transmit bar is depressed, all of the multi-selected channels/talkgroups will transmit at the same time with the same information. Multi-Select is one way communication call. If a radio user responds to a Multi-Select call the talkgroup the user is affiliated to will be the only one to hear the call. There is no super-group formed, so radio communication is still at the single talkgroup level. Multi-Select is utilized to send an APB to several channels/talkgroups. A Multi-Select has a limit of twenty (20) trunking/conventional resources

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 2
CONSOLE-1 - TALKGROUP 1, TALKGROUP 2

VERSION #1.010

2. TEST

- Step 1. From CONSOLE-1, create an Msel group with TALKGROUP 1 and TALKGROUP 2.
- Step 2. Transmit on the Msel using the Msel instant transmit button.
- Step 3. Verify that RADIO-1 and RADIO-2 hear the call.
- Step 4. Initiate a call with RADIO-1.
- Step 5. Verify the call is heard on CONSOLE-1 but not on RADIO-2.
- Step 6. Initiate a call with RADIO-2.
- Step 7. Verify the call is heard on CONSOLE-1 but not on RADIO-1.
- Step 8. On CONSOLE-1 dissolve the Msel.

Pass_____ Fail_____

MCC 7100/7500 Trunked Resources

7.7.22 Multigroup Call

1. DESCRIPTION

This trunking feature allows an equipped console operator position to transmit an announcement to several different talkgroups simultaneously. As with Talkgroup Calls, multigroup calls operate across sites as well as within the same site.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 2
RADIO-3 - RANDOM
CONSOLE-1 - ATG 1

Note: TALKGROUP 1 and TALKGROUP 2 are members of ATG 1. RANDOM is any talkgroup not a member of ATG 1.

VERSION #1.010

2. TEST

- Step 1. Using CONSOLE-1, select the ATG 1 resource.
- Step 2. Initiate the Multigroup Call from CONSOLE-1.
- Step 3. Observe that RADIO-1 and RADIO-2 receive the Multigroup Call.
- Step 4. Verify that RADIO-3 does not receive the Multigroup Call because it is not a member of ATG 1.
- Step 5. Answer the Multigroup Call using RADIO-1 and observe CONSOLE-1 receives the response.
- Step 6. Verify that if the call is answered within the repeater hang time, the console will receive the call on the ATG 1 resource tile, otherwise the console will receive the call on the TALKGROUP 1 tile.
- Step 7. Verify that if the call is answered within the repeater hang time, RADIO-2 will monitor the call.

Pass____ Fail____



7.7.23 PTT Unit ID/Alias Display

1. DESCRIPTION

Console operator positions contain various resources such as talkgroup, multigroup, Private Call which enables the dispatcher to communicate with the subscriber units. If activity occurs on one of these operator position resources, the unit ID or associated alias of the initiating radio appears at the console resource.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 1
CONSOLE-1 - TALKGROUP 1
CONSOLE-2 - TALKGROUP 1

VERSION #1.010

2. TEST

- Step 1. Select the resource for TALKGROUP 1 on CONSOLE-1.
- Step 2. Initiate a call on TALKGROUP 1 from RADIO-2 and observe that the alias is seen at CONSOLE-1 in the resource window as well as in the Activity Log window.
- Step 3. Initiate a call from RADIO-1 and observe that the alias of RADIO-1 is seen at CONSOLE-1 in the resource window as well as in the Activity Log window.
- Step 4. Modify RADIO-2's alias. Make sure to give enough time for the alias change to propagate to the Zone Controller.
- Step 5. Initiate a call from RADIO-2 and observe the new alias of RADIO-2 is seen at CONSOLE-1 in the list in the resource window as well as in the Activity Log window.
- Step 6. Return RADIO-2's alias to its original state.

Pass____ Fail____

7.7.24 Secure / Clear Cross-Mode Indication

1. DESCRIPTION

This test validates the ability of the console to show a visual indication of a Secure and Clear mode mismatch during the following conditions:

1. Talkgroup on the Console is in secure transmit mode but receiving clear audio.
2. Talkgroup on the Console is in clear transmit mode but receiving secure audio.

SETUP

RADIO-1 - TALKGROUP 1 (Secure TX mode)
CONSOLE-1 - TALKGROUP 1 (Secure TX mode)

VERSION #1.010

2. TEST

- Step 1. Initiate a secure call on RADIO-1.
- Step 2. Verify CONSOLE-1 is able to receive audio from RADIO-1.
- Step 3. Place RADIO-1 in clear TX mode.
- Step 4. Initiate a call on RADIO-1.
- Step 5. Verify CONSOLE-1 is able to receive audio from RADIO-1 and displays a secure mode mismatch indication.
- Step 6. Place RADIO-1 in secure transmit mode and place CONSOLE-1 in clear transmit mode.
- Step 7. Initiate a secure call on RADIO-1.
- Step 8. Verify CONSOLE-1 is able to receive audio from RADIO-1 and displays a secure Cross-Mode Indication.

Pass_____ Fail_____

7.7.25 Sending an Alert Tone to Patch Members

1. DESCRIPTION

A console has the ability to send an Alert-Tone to all the members in a patch.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 2
CONSOLE-1 - TALKGROUP 1 & TALKGROUP 2

VERSION #1.010

2. TEST

- Step 1. Using CONSOLE-1, create a patch between TALKGROUP 1 and TALKGROUP 2.
- Step 2. Verify communications between RADIO-1 and RADIO-2.
- Step 3. Using CONSOLE-1, send an Alert-Tone to PATCH-1.
- Step 4. Verify that RADIO-1 and RADIO-2 hear the Alert-Tone.

Pass____ Fail____

7.7.26 Talkgroup Patch - Secure

1. DESCRIPTION

Talkgroup Patch allows a dispatcher to merge several talkgroups together on one voice channel to participate in a single conversation. This can be used for situations involving two or more talkgroups that need to communicate with each other. Using the Patch feature, the console operator can talk and listen to all of the selected talkgroups grouped; in addition, the members of the individual talkgroups can also talk or listen to members of other talkgroups. Patched talkgroups can communicate with the console dispatcher and other members of different talkgroups because of the "supergroup" nature of the Patch feature.

SETUP

RADIO-1 - TALKGROUP 1 (Secure TX Mode)
RADIO-2 - TALKGROUP 2 (Secure TX Mode)
RADIO-3 - TALKGROUP 1 (No secure keys loaded)
RADIO-4 - TALKGROUP 2 (Clear TX Mode with keys loaded)
CONSOLE-1 - TALKGROUP 1 and TALKGROUP 2 (Secure TX Mode)

Note: All 4 Radios must have the same home zone.

VERSION #1.010

2. TEST

- Step 1. Using CONSOLE-1 create a secure patch between TALKGROUP 1 and TALKGROUP 2.
- Step 2. Initiate a patch call from CONSOLE-1.
- Step 3. Verify RADIO-1, RADIO-2 and RADIO-4 can monitor the call.
- Step 4. Initiate a talkgroup call on TALKGROUP 1 from RADIO-1.
- Step 5. Observe that all radios are able to hear RADIO-1 except RADIO-3.
- Step 6. Dissolve the patch.

Pass____ Fail____

MCC 7100/7500 Trunked Resources

7.7.27 Talkgroup Patch

1. DESCRIPTION

Talkgroup Patch allows a dispatcher to merge several talkgroups together on one voice channel to participate in a single conversation. This can be used for situations involving two or more talkgroups that need to communicate with each other. Using the Patch feature, the console operator can talk and listen to all of the selected talkgroups grouped; in addition, the members of the individual talkgroups can also talk or listen to members of other talkgroups. Patched talkgroups can communicate with the console dispatcher and other members of different talkgroups because of the "supergroup" nature of the Patch feature.

NOTE : If "secure" and "clear" resources are patched together, one repeater for each mode may be assigned per site.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 2
RADIO-3 - TALKGROUP 1
RADIO-4 - TALKGROUP 2
CONSOLE-1 - TALKGROUP 1 and TALKGROUP 2

Note: All 4 Radios must have the same home zone.

VERSION #1.010

2. TEST

- Step 1. Using CONSOLE-1 create a patch between TALKGROUP 1 and TALKGROUP 2.
- Step 2. Initiate a patch call from CONSOLE-1.
- Step 3. Verify RADIO-1, RADIO-2, RADIO-3, and RADIO-4 can monitor the call.
- Step 4. Initiate several calls between the radios and verify successful communication.
- Step 5. Dissolve the patch created in step 1.

Pass____ Fail____



7.7.28 Talkgroup Selection and Call

1. DESCRIPTION

The Talkgroup Call is the primary level of organization for communications on a trunked radio system. Dispatchers with Talkgroup Call capability will be able to communicate with other members of the same talkgroup. This provides the effect of an assigned channel down to the talkgroup level. When a Talkgroup Call is initiated from a subscriber unit, the call is indicated on each dispatch operator position that has a channel control resource associated with the unit's channel/talkgroup.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 2
RADIO-3 - TALKGROUP 1
RADIO-4 - TALKGROUP 2
CONSOLE-1 - TALKGROUP 1
CONSOLE-2 - TALKGROUP 2

VERSION #1.010

2. TEST

- Step 1. Initiate a wide area call from CONSOLE-1 on TALKGROUP 1.
- Step 2. Observe that RADIO-1 and RADIO-3 will be able to monitor the call. Dekey the console and have either radio respond to the call.
- Step 3. Observe that all consoles with TALKGROUP 1 can monitor both sides of the conversation.
- Step 4. Initiate a wide area call from CONSOLE-2 on TALKGROUP 2.
- Step 5. Observe that RADIO-2 and RADIO-4 will be able to monitor the call. Dekey the console and have either radio respond to the call.
- Step 6. Observe that all consoles with TALKGROUP 2 can monitor both sides of the conversation.

Pass____ Fail____

WIDE AREA TRUNKING FDMA/TDMA MIXED SITES FATP AND SATP

7.7.29 Auto Site Affiliation

1. DESCRIPTION

A Radio affiliation is a function that links a unique radio ID and unique talkgroup to a specific site. This information is stored in a affiliation table in the zone database.

Before resources are assigned, the affiliation table is accessed to know which sites need to be assigned to support the call. Only the sites that need to be assigned that have associated talkgroups will be assigned. If the site does not have that talkgroup affiliated to it will not be assigned. This allows for more calls to be processed with fewer resources.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 1
RADIO-2 - SITE - SITE 1
RADIO-3 - TALKGROUP 2
RADIO-3 - SITE - SITE 2
RADIO-4 - TALKGROUP 2
RADIO-4 - SITE - SITE 2

This test requires the ZoneWatch feature.

Note: There are system settings which could affect the assignment of resources, such as required site.

VERSION #1.030

2. TEST

- Step 1. Turn RADIO-1 off and on.
- Step 2. Verify via ZoneWatch that RADIO-1 sends in its affiliation.
- Step 3. Initiate a call using RADIO-1 on TALKGROUP 1.
- Step 4. Verify RADIO-2 can receive and respond to the call. Using ZoneWatch verify that no resources are assigned at SITE 2 as there are no subscribers affiliated to TALKGROUP 1 at SITE 2.
- Step 5. Initiate a call on TALKGROUP 2 using RADIO-3.
- Step 6. Verify that RADIO-4 can receive and respond to the call. Using ZoneWatch verify that no resources are assigned at SITE 1 as there are no subscribers affiliated to TALKGROUP 2 at SITE 1.

Pass_____ Fail_____

Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.30 Talkgroup Call

1. DESCRIPTION

The Talkgroup is the primary level of organization for communications on a trunked radio system. Radios with Talkgroup call capability will be able to communicate with other members of the same Talkgroup. This provides the effect of a private channel down to the Talkgroup level.

This test will demonstrate that a Talkgroup transmission initiated by a radio user will only be heard by system users, which have, the same Talkgroup selected. As with other types of calls, Talkgroup calls can take place from anywhere in the system.

SETUP

RADIO-1 - SITE 1 - TALKGROUP 1
RADIO-2 - SITE 2 - TALKGROUP 1
RADIO-3 - SITE 1 - TALKGROUP 2
RADIO-4 - SITE 2 - TALKGROUP 2

VERSION #1.040

2. TEST

- Step 1. Initiate a Wide Area Call with RADIO-1 in TALKGROUP 1.
- Step 2. Observe that only RADIO-2 will be able to monitor and respond to the call.
- Step 3. Initiate a Wide Area Call with RADIO-3 in TALKGROUP 2.
- Step 4. Observe that only RADIO-4 will be able to monitor and respond the call.

Pass____ Fail____



Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.31 Private Call

1. DESCRIPTION

Private Call is a selective calling feature that allows a radio user to carry on one-to-one conversation that is only heard by the 2 parties involved. Subscriber units receiving a private call will sound an alert tone. As with other types of calls, Private Calls can take place from anywhere in the system.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 1
RADIO-3 - TALKGROUP 1

VERSION #1.020

2. TEST

- Step 1. Using RADIO-1, press the Private Call (Call) button.
- Step 2. Enter the unit ID of RADIO-2 with the keypad, or scroll to the location where this ID is stored.
- Step 3. Press the PTT to initiate the Private Call.
- Step 4. Verify that RADIO-2 hears tones and the display indicates that a Private Call has been received, but RADIO-3 receives no indications.
- Step 5. Answer the call at RADIO-2 by pressing the Private Call (Call)/Respond button. If RADIO-2 has a display, verify it shows the ID number or Alias of the calling unit.
- Step 6. Press the PTT switch on RADIO-2 and respond to the Private Call. Note that if you do not press the Private Call button before pressing PTT, your audio will be heard by all members of the talkgroup, and not just by the radio initiating the Private Call.
- Step 7. Verify that RADIO-2 can communicate with RADIO-1.
- Step 8. Verify that RADIO-3 does not monitor the Private Call.
- Step 9. End the Private Call by pressing the "home" key and return to normal talkgroup operation.

Pass_____ Fail_____



Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.32 Multigroup Call in Interrupt Mode

1. DESCRIPTION

This trunking feature allows an equipped radio user to transmit an announcement to several different talkgroups simultaneously. When the multigroup (MG) is flagged for Interrupt Mode the trunked system does not wait for attached talkgroups to finish calls in progress. Upon dekeying, the interrupted radios will join the multigroup call in progress. As with other types of calls, multigroup calls can take place from anywhere in the system.

NOTE: A receiver interference failure may appear if RADIO-1 is not immediately dekeyed. This test is not recommended for single site systems as RF contention will occur.

SETUP

RADIO-1 - TALKGROUP 3
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 4
RADIO-2 - SITE - SITE 1
RADIO-3 - RANDOM (Not part of MG)
RADIO-3 - SITE - SITE 2
RADIO-4 - ATG 2
RADIO-4 - SITE - SITE 2

* TALKGROUP 3 and TALKGROUP 4 are members of ATG 2.

* RANDOM is any talkgroup not a member of ATG 2.

VERSION #1.010

2. TEST

- Step 1. Verify ATG 2 is set for the Interrupt mode.
- Step 2. Using RADIO-1, initiate a call on TALKGROUP 3.
- Step 3. While RADIO-1 is keyed, initiate a multigroup call using RADIO-4 on ATG 2. Verify RADIO-2 receives the call but RADIO-3 does not unmute.
- Step 4. Dekey RADIO-1 and verify RADIO-1 unmutes and joins the multigroup call in progress.

Pass____ Fail____



Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.33 Multigroup Call in Wait Mode

1. DESCRIPTION

This trunking feature allows an equipped radio user to transmit an announcement to several different talkgroups simultaneously. The multigroup (ATG) call can be flagged for Wait Mode in the Provisioning Manager (PM) database forcing all attached talkgroups to finish calls in progress before the trunked system will process the multigroup call. The system does not permit inactive, attached talkgroups to initiate Talkgroup Calls during the "wait" timeframe. As with other types of calls, multigroup calls can take place from anywhere in the system.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 2
RADIO-3 - RANDOM (Not part of MG)
RADIO-4 - ATG 1

* TALKGROUP 1 and TALKGROUP 2 are members of ATG 1.

* RANDOM is any talkgroup not a member of ATG 1.

* Multigroups are set up through both the Provisioning Manager (PM) and the Subscriber Programming software.

VERSION #1.020

2. TEST

- Step 1. Verify ATG 1 is set for the Wait mode.
- Step 2. Using RADIO-1, initiate a call on TALKGROUP 1.
- Step 3. While RADIO-1 is keyed, attempt to initiate a multigroup call using RADIO-4 on ATG 1. Verify RADIO-4 receives a busy tone because one of the talkgroups attached to ATG 1 is involved in a Talkgroup Call.
- Step 4. Key RADIO-2 and verify that a busy tone is received because the ATG 1 call is in queue.
- Step 5. Dekey RADIO-1 and verify RADIO-4 receives a callback.
- Step 6. Key RADIO-4 and verify both RADIO-1 and RADIO-2 hear the multigroup call while RADIO-3 does not unmute.

Pass____ Fail____

Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.34 Agencygroup Interrupt Mode

1. DESCRIPTION

This test will demonstrate the basic functionality of Agencygroups. An active member [Talkgroup / Multigroup] call will be interrupted by an Agencygroup call, when the Agencygroup is configured for interrupt mode.

SETUP

RADIO-1 – MG1
RADIO-2 – TALKGROUP 1
RADIO-3 – AG1

Note:

TALKGROUP 1 is assigned to multigroup MG1
MG1 is configured in wait mode.
MG1 is assigned to the Agencygroup AG1
AG1 is configured in interrupt mode
AG1 is configured as the highest priority TG

Note: Radios must be configured with AG1 as a Priority Scan member.

VERSION #1.010

2. TEST

- Step 1. Initiate a call using RADIO-1 on MG1. Verify that audio from RADIO-1 is heard on RADIO-2. Keep RADIO-1 keyed until the completion of this test.
- Step 2. Initiate a call using RADIO-3 on AG1. Verify audio from RADIO-3 is heard on RADIO-2. The RADIO-1 call is dropped as soon as RADIO-3 keys up.
- Step 3. End the call on RADIO-3. Verify that the calls have completed and no audio is heard.

Pass____ Fail____

Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.35 Audio Interrupt / Interrupt Always Mode

1. DESCRIPTION

A radio PTT request may be received for a group already active and currently being sourced by another radio unit. The talkgroup can be flagged to either allow or disallow the new PTT. If allowed, the latest PTT request will be granted and become the source of the call.

Note: This test is not recommended for single site systems as RF contention will occur.

SETUP

RADIO-1 - TALKGROUP 4
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 4
RADIO-2 - SITE - SITE 2
RADIO-3 - TALKGROUP 4
RADIO-3 - SITE - SITE 2

VERSION #1.020

2. TEST

- Step 1. Verify TALKGROUP 4's template to be Audio Interrupt Always.
- Step 2. Using RADIO-1, initiate a call on TALKGROUP 4.
- Step 3. Verify both RADIO-2 and RADIO-3 monitor the audio.
- Step 4. Using RADIO-3, initiate a call on TALKGROUP 4.
- Step 5. Verify that RADIO-2 now listens to RADIO-3.
- Step 6. Dekey both Radios.

Pass_____ Fail_____



Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.36 Audio Interrupt / Interrupt Never Mode

1. DESCRIPTION

A radio PTT request may be received for a group already active and currently being sourced by another radio unit. The talkgroup can be flagged to either allow or disallow the new PTT. If allowed, the latest PTT request will be granted and become the source of the call.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 1
RADIO-3 - TALKGROUP 1

VERSION #1.020

2. TEST

- Step 1. Verify TALKGROUP 1's template is set up as Audio Interrupt Never.
- Step 2. Using RADIO-1, initiate a call on TALKGROUP 1.
- Step 3. Verify both RADIO-2 and RADIO-3 monitor the audio.
- Step 4. Using RADIO-3, initiate a call on TALKGROUP 1.
- Step 5. Verify that RADIO-3 receives a reject and that RADIO-2 continues to listen to RADIO-1.
- Step 6. Dekey both Radios.

Pass_____ Fail_____



Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.37 Priority Monitor/Non-Priority Scan

1. DESCRIPTION

This test will demonstrate that a subscriber unit can scan a pre-programmed list to find any Priority and Non-priority Talkgroups with assigned voice channels at that site. To demonstrate this, a call will be initiated from a subscriber at a remote site on a talkgroup monitored by a subscriber at the same site as the scanning radio. The scanning radio will scan from its selected talkgroup to the active talkgroup.

Note: Subscribers must be capable of supporting the Talkgroup scan.

SETUP

RADIO-1 - TALKGROUP 1 (SCANNING)
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 2
RADIO-2 - SITE - SITE 1
RADIO-3 - TALKGROUP 3
RADIO-3 - SITE - SITE 1
RADIO-4 - TALKGROUP 3
RADIO-4 - SITE - SITE 2

* RADIO-1 needs to be set to a dial position configured to scan.

VERSION #1.010

2. TEST

- Step 1. Verify that RADIO-1 is set to TALKGROUP 1 and in the scan mode of operation and programmed to scan TALKGROUP 1, TALKGROUP 2, and TALKGROUP 3.
- Step 2. Initiate a Talkgroup Call with RADIO-4 and observe that RADIO-1 scans to the talkgroup and receives the call. Keep the call in progress until completion of the following step.
- Step 3. Initiate a Talkgroup Call with RADIO-2 and observe that RADIO-1 does not receive the call since RADIO-1 is listening to TALKGROUP 3.

Pass____ Fail____

Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.38 Priority Monitor/Priority Scan

1. DESCRIPTION

A subscriber unit can scan a pre-programmed list (in the radio) to find any Priority and Non-priority Talkgroups with assigned voice channels at that site. To demonstrate this, a call will be initiated from a portable at a remote site on a talkgroup monitored by a portable at the same site as the scanning radio. The scanning radio will scan from its selected talkgroup to the active talkgroup. The test will be repeated with an additional radio transmitting on the Priority Talkgroup while the scanning radio is scanning. This third radio will be on a remote site with a fourth radio on the Priority Talkgroup at the same site as the scanning radio.

SETUP

RADIO-1 - TALKGROUP 1 (SCANNING)
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 1
RADIO-2 - SITE - SITE 1
RADIO-3 - TALKGROUP 1
RADIO-3 - SITE - SITE 2
RADIO-4 - TALKGROUP 2
RADIO-4 - SITE - SITE 2
RADIO-5 - TALKGROUP 2
RADIO-5 - SITE - SITE 1

VERSION #1.010

2. TEST

- Step 1. Verify that RADIO-1 is set to TALKGROUP 1 and in the scan mode of operation and programmed to scan TALKGROUP 1 and TALKGROUP 2 with TALKGROUP 1 as its Priority Monitor Talkgroup.
- Step 2. Verify Priority Monitor and the Valid Site setting is set to yes for SITE 2.
- Step 3. Initiate a Talkgroup Call with RADIO-4 to RADIO-5 and observe that RADIO-1 scans to the talkgroup and receives the call. Keep the call in progress until the completion of the following step.
- Step 4. Initiate a Talkgroup Call with RADIO-3 and observe that RADIO-1 reverts to the TALKGROUP 1 and receives the call.

Pass_____ Fail_____

Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.39 Secure Operation

1. DESCRIPTION

Digital encryption is used to scramble a transmission so only properly equipped and configured radios can monitor the conversation. A "Key" is used to encrypt the transmit audio. Only radios with the same "Key" can decrypt the audio and listen to it.

SETUP

RADIO-1 - TALKGROUP 1 (SECURE TX MODE)
RADIO-2 - TALKGROUP 1 (SECURE TX MODE)
RADIO-3 - TALKGROUP 1 (SECURE MODE and no, or incorrect key)
RADIO-4 - TALKGROUP 1 (Clear TX Mode)

Note: The identical secure mode must be programmed into RADIO-1, RADIO-2, RADIO-4 and that RADIO-3 has no secure code loaded or has a unique secure code from the other testing radios.

VERSION #1.020

2. TEST

- Step 1. Initiate a secure wide area call with RADIO-1 on TALKGROUP 1. Keep this call in progress until instructed to end the call.
- Step 2. Observe that RADIO-2 will be able to monitor the call.
- Step 3. Observe that RADIO-3 does not receive the call.
- Step 4. Observe that RADIO-4 will also receive the call even with the secure switch set to the non-secure mode of operation.
- Step 5. End the call from RADIO-1.
- Step 6. Respond with RADIO-2 and verify that RADIO-1 receives the response audio but RADIO-3 cannot.

Pass____ Fail____



Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.40 Call Alert

1. DESCRIPTION

Call Alert is a tone page that allows a user to selectively alert another radio unit. The initiating radio will receive notification from the trunked system as to whether or not the page was received by the target radio. Units receiving a Call Alert will sound an alert tone. As with other types of calls, Call Alerts can take place from anywhere in the system.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 2
RADIO-3 - TALKGROUP 3

VERSION #1.010

2. TEST

- Step 1. Using RADIO-1, press the page button.
- Step 2. Enter the unit ID of RADIO-2 with the keypad, or scroll to the location where this ID is stored
- Step 3. Press the PTT to initiate the call alert. Verify that the RADIO-1 user receives audible indication that the Call Alert was sent.
- Step 4. Verify that RADIO-2 user receives an audible indication of an incoming Call Alert was sent but RADIO-3 does not.
- Step 5. Verify RADIO-1 gets an audible indication that the Call Alert was successfully received at the target radio.
- Step 6. Turn off RADIO-2. Send a Call Alert from RADIO-1 to RADIO-2.
- Step 7. Verify that the RADIO-1 user receives audible indication that the Call Alert was sent.
- Step 8. Verify RADIO-1 receives a "No Acknowledgement" indication that the Call Alert was not received at the target radio.

Pass____ Fail____



Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.41 Channel Partitioning Operation

1. DESCRIPTION

This feature provides exclusive use of designated RF channels for high priority groups. This test will demonstrate that the calls belonging to the high priority group are steered to the RF channels that are designated.

In this test case a second User Group (UG2) will be configured. The User Group will be assigned to the talkgroup TALKGROUP 5 profile. UG2 will be used for RF Channel 5 at SITE 1 to be tested. This will ensure that UG2 will have exclusive use of Channel 5.

Note: In TDMA operation both TDMA time slots on the BR are assigned to this User Group. Channel Partitioning is a licensed feature.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 5
RADIO-2 - SITE - SITE 1
RF Channel 5 assigned to UG2

VERSION #1.010

2. TEST

- Step 1. Initiate a talkgroup call on TALKGROUP 5 from RADIO-2 on SITE 1.
- Step 2. Verify that RADIO-2 is assigned RF channel 5.
- Step 3. Release the PTT and wait for the talkgroup call to end.
- Step 4. Initiate a talkgroup call from RADIO-1 on TALKGROUP 1 at SITE 1.
- Step 5. Observe that the talkgroup call from RADIO-1 is not assigned RF channel 5.
- Step 6. Release the PTT on RADIO-1 and wait until the channel for the TALKGROUP 1 call is dropped. Initiate another call on RADIO-1. Verify that RADIO-1 is again assigned to a channel other than RF channel 5.
- Step 7. Repeat the process until all channels have been cycled through. Verify that RF channel 5 does not get assigned to the TALKGROUP 1 call.
- Step 8. Initiate a call on RADIO-2 and verify RF channel 5 is assigned.

Pass____ Fail____



Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.42 Continuous Assignment Updating

1. DESCRIPTION

When a talkgroup is assigned a voice channel, the site controller continues to transmit the channel assignment on the control channel for the duration of the talkgroup call. Radios coming into use on the system are automatically sent to voice channels with conversations in progress involving their selected talkgroups.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 1
RADIO-3 - TALKGROUP 1

VERSION #1.010

2. TEST

- Step 1. Turn OFF RADIO-1.
- Step 2. Initiate a Talkgroup Call using RADIO-2 and verify RADIO-3 hears the audio.
- Step 3. While the Talkgroup Call is in progress, turn ON RADIO-1.
- Step 4. Observe RADIO-1, which was just brought back into service, joins the Talkgroup Call already in progress.
- Step 5. End the talkgroup call.
- Step 6. Switch RADIO-1 to another talkgroup.
- Step 7. Initiate a Talkgroup Call from RADIO-2 to RADIO-3.
- Step 8. While the Talkgroup Call is in progress, set RADIO-1 back to TALKGROUP 1.
- Step 9. Observe that RADIO-1 joins the Talkgroup Call already in progress.

Pass_____ Fail_____



Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.43 Emergency Alarm and Call with Talkgroup Revert

1. DESCRIPTION

Users in life threatening situations can use the Emergency button on the radio to immediately send a signal to the dispatcher and be assigned the next available voice channel. An Emergency Call can be set to either Top of Queue or Ruthless Preemption operation. During an emergency call the Emergency ID will appear on the display of the subscribers. To demonstrate this, an Emergency Alarm and Call will be initiated from a subscriber which will be received by a subscriber affiliated at any site of any zone in the system.

This test will demonstrate a subscriber has the ability to revert to a specific talkgroup when an emergency is initiated. This is useful when the users have a designated talkgroup for handling emergencies. The revert talkgroup must be set in the subscriber via software.

NOTE: If the subscriber does not have the Display option, the Emergency ID will not be displayed.

SETUP

RADIO-1 - TALKGROUP 4
RADIO-2 - TALKGROUP 4
RADIO-3 - EMERGENCY TG

* EMERGENCY TG is the talkgroup programmed for emergency reverts.

VERSION #1.020

2. TEST

- Step 1. Initiate a call on TALKGROUP 4 from RADIO-1 and verify RADIO-2 can hear the audio. Verify RADIO-3 does not hear the audio.
- Step 2. Dekey RADIO-1.
- Step 3. Using RADIO-1, send an Emergency Call by depressing the emergency switch and then the PTT switch.
- Step 4. Observe the display on RADIO-3 denotes an emergency and the unit ID or alias of the unit sending the emergency and that RADIO-3 can hear RADIO-1's audio.
- Step 5. In addition observe that RADIO-2 cannot hear RADIO-1's audio.
- Step 6. Release the PTT switch on RADIO-1 and end the Emergency Call by holding down the Emergency button.

Pass____ Fail____

Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.44 Dynamic FDMA/TDMA Talkgroup Call Mode Change

1. DESCRIPTION

The Talkgroup is the primary level of organization for communications on a trunked radio system. Radios with Talkgroup Call capability will be able to communicate with other members of the same Talkgroup. This provides the effect of a private channel down to the Talkgroup level. The FDMA/TDMA mode of the call depends on Talkgroup programming, the capabilities of radios registered to the talkgroup and the capabilities of the sites at which they are registered. The FDMA/TDMA mode of a "Dynamic" Talkgroup call depends on the capabilities of the radios registered to the Talkgroup. A TDMA to FDMA mode change is preceded by transmission trunking. A call in the FDMA mode remains in that mode until the call drops. An FDMA call will not be transmission trunked and changed to a TDMA call.

Note: The FDMA/TDMA mode of a call can not change during a PTT. TALKGROUP 1 and TALKGROUP 2 are programmed for "Dynamic". SITE 1 and SITE 2 must be TDMA capable.

SETUP

RADIO-1 (TDMA) - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 (TDMA) - TALKGROUP 1
RADIO-2 - SITE - SITE 2
RADIO-3 (TDMA) - TALKGROUP 2
RADIO-3 - SITE - SITE 1
RADIO-8 (FDMA-only) - TALKGROUP 1
RADIO-8 - SITE - SITE 1

VERSION #1.010

2. TEST

- Step 1. Turn off RADIO-8.
- Step 2. Initiate a wide area call with RADIO-1 on TALKGROUP 1. Keep the call in progress until instructed to end it.
- Step 3. Observe that only RADIO-2 will be able to monitor and respond to the call. Observe that the channel is assigned in the TDMA mode since there are no FDMA-only radios in the call.
- Step 4. Turn on RADIO-8. Note that RADIO-8 cannot hear the call which is still in the TDMA mode.
- Step 5. Dekey RADIO-1. Observe that the channel dekeys immediately.
- Step 6. Initiate a wide area call with RADIO-1 on TALKGROUP 1. Keep the call in progress until instructed to end it.
- Step 7. Observe that both RADIO-2 and RADIO-8 will now be able to monitor and respond to the call. Observe that the channel is now assigned in the FDMA mode.
- Step 8. Turn off RADIO-8.
- Step 9. Dekey RADIO-1 and have RADIO-2 initiate the call during the hangtime. Observe that the channel is still assigned in the FDMA mode.

Pass____ Fail____



Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.45 Dynamic FDMA/TDMA Emergency Alarm and Call with Ruthless Preemption - FDMA call over-rides

1. DESCRIPTION

Users in life threatening situations can use the Emergency button on the radio to immediately send a signal to the dispatcher and be assigned the next available voice channel. An Emergency Call can be set to either Top of Queue or Ruthless Preemption operation. To accomplish this, an Emergency Alarm and Call will be initiated from a subscriber which will be received by a subscriber affiliated at any site of any zone in the system. In this test case, the emergency call will cause 2 TDMA calls to be pre-empted.

NOTE: If the subscriber does not have the Display option, the Emergency ID will not be displayed. This test is not recommended for single site systems as RF contention will occur. SITE 1 must be TDMA capable.

SETUP

RADIO-1 (TDMA) - TALKGROUP 5
RADIO-1 - SITE - SITE 1
RADIO-3 (TDMA) - TALKGROUP 2
RADIO-3 - SITE - SITE 1
RADIO-4 (TDMA) - TALKGROUP 3
RADIO-4 - SITE - SITE 1
RADIO-8 (FDMA-only) - TALKGROUP 5
RADIO-8 - SITE - SITE 1

Note: TALKGROUP 5, TALKGROUP 2 and TALKGROUP 3 are programmed for "Dynamic".

VERSION #1.020

2. TEST

- Step 1. The emergency type for TALKGROUP 5's template must be configured as Ruthless Preemption.
- Step 2. Simulate a busy system by disabling all channels at SITE 1 with the exception of the control channel and one voice channel.
- Step 3. Initiate a call with both RADIO-3 and RADIO-4 and hold the PTT switches until instructed to release. Both calls are assigned in the TDMA mode to the single voice channel.
- Step 4. Key RADIO-1 and verify the radio receives a busy tone.
- Step 5. Using RADIO-1 send an Emergency Call by pressing the emergency switch and then the PTT switch.
- Step 6. Observe that RADIO-1 is granted the channel immediately and the Talkgroup Calls are dropped for RADIO-3 and for RADIO-4.
- Step 7. Observe that the display on RADIO-8 denotes an emergency and the unit ID of RADIO-1. Also observe that the channel is assigned in the FDMA mode.
- Step 8. Dekey RADIO-3 and RADIO-4.
- Step 9. Exit the Emergency mode by holding down the Emergency button on RADIO-1 until an alert tone sounds. Verify RADIO-1 returns to normal operation.

Pass____ Fail____



Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.46 Dynamic FDMA/TDMA Busy Queue Conversion

1. DESCRIPTION

If no voice channel resources are available, radios requesting channels for new conversations are placed in a queue. Users of the same priority will move through the queue in a FIFO (first in, first out) sequence.

When a voice channel becomes available, the radio at the top of the busy queue gets a channel assignment and generates a callback tone if the FDMA/TDMA mode of the call can be supported by the available resource. While the call is waiting in the busy queue, the FDMA/TDMA mode of a talkgroup at a site in site trunking can be change as radios join or leave the talkgroup.

NOTE: All radios and talkgroups should start with default priorities. The Default is 10.

SETUP

RADIO-1 (TDMA) - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 (TDMA) - TALKGROUP 1
RADIO-2 - SITE - SITE 1
RADIO-8 (FDMA-only) - TALKGROUP 2
RADIO-8 - SITE - SITE 1
RADIO-9 (FDMA-only) - TALKGROUP 2
RADIO-9 - SITE - SITE 1

VERSION #1.010

2. TEST

- Step 1. Simulate a busy system by disabling all channels at SITE 1 with the exception of the control channel and one voice channel.
- Step 2. Initiate a TALKGROUP 2 call using RADIO-9. Verify RADIO-8 receives the call. Keep the call in progress until instructed to end it. Observe that the channel is assigned in the FDMA mode.
- Step 3. Initiate a TALKGROUP 1 call using RADIO-1 and observe that the radio receives a busy.
- Step 4. Dekey RADIO-9 and observe that RADIO-1 receives a callback and can make the call. Observe that the channel is assigned in the TDMA mode since there are no FDMA-only radios in the call.
- Step 5. Initiate a TALKGROUP 2 call using RADIO-9 and observe that the radio receives a busy.
- Step 6. Dekey RADIO-1 and observe that RADIO-9 receives a callback and can make the call. Observe that the channel is assigned in the FDMA mode.

Pass____ Fail____



Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.47 Multigroup Call - TDMA Only Group

1. DESCRIPTION

This trunking feature allows an equipped radio user to transmit an announcement to several different talkgroups simultaneously. As with other types of calls, multigroup calls can take place from anywhere in the system. If the multigroup is flagged as TDMA-only, then the system requires that all talkgroups that are part of the multigroup must be flagged as TDMA-only or dynamic. If a dynamic talkgroup currently operated in FDMA mode is part of a TDMA only multigroup, then all the TDMA users of the dynamic talkgroup can get the audio but FDMA users of the dynamic talkgroup can not get the audio from the multigroup call.

Note: TALKGROUP 5, TALKGROUP 6 are programmed as "Dynamic" and members of ATG 3. SITE 1 and SITE 2 are TDMA capable. ATG 3 is programmed as "TDMA-only".

SETUP

RADIO-1 (TDMA) - TALKGROUP 5
RADIO-1 - SITE - SITE 1
RADIO-2 (TDMA) - TALKGROUP 6
RADIO-2 - SITE - SITE 1
RADIO-4 (TDMA) - ATG 3
RADIO-4 - SITE - SITE 2
RADIO-8 (FDMA-only) - TALKGROUP 6
RADIO-8 - SITE - SITE 2

VERSION #1.020

2. TEST

- Step 1. Using RADIO-4, initiate a call on ATG 3.
- Step 2. Verify that RADIO-1 and RADIO-2 can monitor the call. Observe that the channel is assigned in the TDMA mode.
- Step 3. Observe that RADIO-8 cannot monitor the call because it is not TDMA capable.

Pass____ Fail____



Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.48 Dynamic FDMA/TDMA Busy Queuing and Callback with Ten Talkgroup Priority Levels

1. DESCRIPTION

If no voice channel resources are available, radios requesting channels for new conversations are placed in a queue. Users of the same priority will move through the queue in a first in, first out sequence; however, users of higher priority will be inserted ahead of lower priority users in queue. When a voice channel becomes available, the radio at the top of the busy queue gets a channel assignment and generates a callback tone if the FDMA/TDMA mode of the call can be supported by the available resource. Otherwise, the first call in the queue that can use the available resource gets assigned. The callback tone alerts the user that a channel assignment was made and transmitting is now possible on the selected talkgroup. In this test case, the available resource can NOT support the FDMA call mode.

NOTE: An Emergency Call has the highest priority at level 1. The highest assignable priority is 2 and 10 is the lowest. All radios and talkgroups should start with default priorities. The default is 10. SITE 1 must be TDMA capable.

SETUP

RADIO-1 (TDMA) - TALKGROUP 1

RADIO-1 - SITE - SITE 1

RADIO-2 (TDMA) - TALKGROUP 2

RADIO-2 - SITE - SITE 1

RADIO-4 (TDMA) - TALKGROUP 4

RADIO-4 - SITE - SITE 1

RADIO-8 (FDMA-only) - TALKGROUP 6

RADIO-8 - SITE - SITE 1

Note: TALKGROUP 1, TALKGROUP 2 and TALKGROUP 6 are programmed for "Dynamic".

VERSION #1.020

2. TEST

- Step 1. Simulate a busy system by disabling all channels at SITE 1 with the exception of the control channel and one voice channel.
- Step 2. Verify the priority level for TALKGROUP 6's template is configured as priority 9.
- Step 3. Initiate Talkgroup Calls with RADIO-1 and with RADIO-2. Keep these calls in progress until instructed to end them. Both calls are assigned in the TDMA mode to the single voice channel.
- Step 4. Key RADIO-8 and observe that the radio receives a busy.
- Step 5. Key RADIO-4 and observe that the radio receives a busy.
- Step 6. End the call on RADIO-1.
- Step 7. Observe RADIO-4 receives the first callback and can now make a call because the available resource can not support an FDMA call.
- Step 8. End the calls on RADIO-2 and RADIO-4.
- Step 9. Observe RADIO-8 now receives a callback and can make a call upon receipt of the callback indication since there is now a FDMA channel available.

Pass____ Fail____



Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.49 Dynamic FDMA/TDMA Emergency Alarm and Call mode change

1. DESCRIPTION

Users in life threatening situations can use the Emergency button on the radio to immediately send a signal to the dispatcher and be assigned the next available voice channel if the FDMA/TDMA mode of the call can be supported by the available resource. For talkgroups programmed as dynamic, the FDMA/TDMA mode may change from TDMA to FDMA. In that case, the current TDMA call is transmission trunked and started in the FDMA mode on the next PTT. However, the emergency mode is not re-activated until the subscriber with the emergency does a PTT.

NOTE: If the subscriber does not have the PTT Display option, the Emergency ID will not be displayed. All radios and talkgroups should start with default priorities. The default is 10.

SETUP

RADIO-1 (TDMA) - TALKGROUP 1

RADIO-1 - SITE - SITE 1

RADIO-2 (TDMA) - TALKGROUP 1

RADIO-2 - SITE - SITE 1

RADIO-8 (FDMA-only) - TALKGROUP 1

RADIO-8 - SITE - SITE 2

Note: TALKGROUP 1 is programmed for "Dynamic".
SITE 1 and SITE 2 must be TDMA capable.

VERSION #1.010

2. TEST

- Step 1. Power off RADIO-8.
- Step 2. Using RADIO-1 send an Emergency Call by depressing the emergency switch and then the PTT switch. Observe that the channel is assigned in the TDMA mode since there are no FDMA-only radios in the call.
- Step 3. Verify the display on RADIO-2 denotes an emergency and the unit ID or alias of RADIO-1.
- Step 4. Power on RADIO-8. Note that RADIO-8 cannot hear the call which is in progress in the TDMA mode.
- Step 5. End the call on RADIO-1. Observe that the channel dekeys immediately.
- Step 6. Initiate a call on TALKGROUP 1 with RADIO-1. Keep this call in progress until instructed to end the call.
- Step 7. Verify the displays on RADIO-8 and RADIO-2 both denote an emergency and the unit ID or alias of RADIO-1.
- Step 8. Observe that both RADIO-2 and RADIO-8 will be able to monitor and respond to the call. Observe that the channel is now assigned in the FDMA mode.
- Step 9. Dekey RADIO-1 and end the Emergency Call by holding down the Emergency button on RADIO-1 until an alert tone sounds.

Pass_____ Fail_____

Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.50 Dynamic FDMA/TDMA Multigroup Call

1. DESCRIPTION

This trunking feature allows an equipped radio user to transmit an announcement to several different talkgroups simultaneously. As with other types of calls, multigroup calls can take place from anywhere in the system. A Dynamic multigroup can contain FDMA-only, TDMA-only and Dynamic talkgroups. The FDMA/TDMA mode of a "Dynamic" multigroup will be determined by the capabilities of the radios affiliated to the talkgroups and multigroup and the capabilities of the sites where the radios are affiliated.

Note: TALKGROUP 1, TALKGROUP 2 are members of ATG 1 and programmed as "Dynamic". SITE 1 and SITE 2 must be TDMA capable. ATG 1 is programmed as Dynamic.

SETUP

RADIO-1 (TDMA) - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 (TDMA) - TALKGROUP 2
RADIO-2 - SITE - SITE 1
RADIO-4 (TDMA) - ATG 1
RADIO-4 - SITE - SITE 2
RADIO-8 (FDMA-only) - TALKGROUP 2
RADIO-8 - SITE - SITE 2

VERSION #1.010

2. TEST

- Step 1. Turn off RADIO-8.
- Step 2. Using RADIO-4, initiate a call on ATG 1.
- Step 3. Observe that RADIO-1 and RADIO-2 can monitor the call. Observe that the channel is assigned in the TDMA mode since there are no FDMA radios affiliated to either talkgroup.
- Step 4. Dekey RADIO-4 and turn on RADIO-8.
- Step 5. Using RADIO-4, initiate a call on ATG 1.
- Step 6. Observe that RADIO-1, RADIO-2 and RADIO-8 can monitor the call. Observe that the channel is now assigned in the FDMA mode.

Pass_____ Fail_____

Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.51 Site Access Control/"Both" Site Access Denial

1. DESCRIPTION

The system can be configured to limit radio or talkgroup access to selected valid sites. Control can be exercised to restrict radio users or talkgroups to certain sites, or to steer radio activity away from smaller sites in an effort to avoid busies. System flags establish which sites are valid for each individual radio user, talkgroup and multigroup. An overall Site Access Denial flag for the system governs how these radio and talkgroup settings affect the affiliation or rejection of radios to individual sites. Once a subscriber unit has been denied at a site, it will not attempt to access that site unless power is cycled or the user changes talkgroups. Four possible values for the Site Access Denial flag exist: Individual Only, Talkgroup Only, Either, or Both.

"Both" Site Access Denial indicates that a radio will not be allowed to affiliate to a site only if both the radio user and affiliated talkgroup do not have access to the site.

NOTE: Site Denial flags are not cleared from the subscriber until the power is cycled or the talkgroup is changed.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 1
RADIO-2 - SITE - SITE 2

VERSION #1.010

2. TEST

- Step 1. Verify/Set the Site Access Denial Flag to Both.
- Step 2. Cycle power to RADIO-1 and RADIO-2 to force them to affiliate, this will clear any site denials they may hold in memory.
- Step 3. Initiate a TALKGROUP 1 call from RADIO-2. Verify that RADIO-2 is allowed to make the TALKGROUP 1 call.
- Step 4. Set SITE 2 to be a non-valid site for RADIO-2.
- Step 5. Initiate a TALKGROUP 1 call from RADIO-2. Verify that RADIO-2 is allowed to make the TALKGROUP 1 call.
- Step 6. Set SITE 2 to be a non-valid site for TALKGROUP 1.
- Step 7. Verify the updates complete.
- Step 8. Initiate a TALKGROUP 1 call from RADIO-2. Verify that RADIO-2 receives a reject, and roams to a valid site. RADIO-2 is not allowed to make the TALKGROUP 1 call from SITE 2 since TALKGROUP 1 nor RADIO-2 is valid at SITE 2.
- Step 9. Reset all Talkgroup and Radio User flags. Verify the updates complete.
- Step 10. Recycle power to the radios to clear the affiliation flags.

Pass____ Fail____



Wide Area Trunking FDMA/TDMA Mixed Sites

7.7.52 Site Access Control/"Either" Site Access Denial

1. DESCRIPTION

The system can be configured to limit radio or talkgroup access to selected valid sites. Control can be exercised to restrict radio users or talkgroups to certain sites, or to steer radio activity away from smaller sites in an effort to avoid busies. System flags establish which sites are valid for each individual radio user, talkgroup and multigroup. An overall Site Access Denial flag for the system governs how these radio and talkgroup settings affect the affiliation or rejection of radios to individual sites. Once a subscriber unit has been denied at a site, it will not attempt to access that site unless power is cycled or the user changes talkgroups. Four possible values for the Site Access Denial flag exist: Individual Only, Talkgroup Only, Either, or Both.

"Either" Site Access Denial indicates that a radio will not be allowed to affiliate to a site if either the radio user or affiliated talkgroup does not have access to that site.

NOTE: Site Denial flags are not cleared from the subscriber until the power is cycled or the talkgroup is changed.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 1
RADIO-2 - SITE - SITE 2
RADIO-3 - TALKGROUP 2
RADIO-3 - SITE - SITE 2

VERSION #1.020

2. TEST

- Step 1. Set the Site Access Denial Flag to "Either".
- Step 2. Verify that the change has completed.
- Step 3. Cycle power to the radios to force them to affiliate, this will clear any site denials they may hold in memory.
- Step 4. Initiate a TALKGROUP 1 call from RADIO-2. Verify that RADIO-2 is allowed to make the TALKGROUP 1 call.
- Step 5. Set SITE 2 to be a non-valid site for RADIO-2.
- Step 6. Initiate a TALKGROUP 1 call from RADIO-2. Verify that RADIO-2 receives a reject, and roams to a valid site. RADIO-2 is not allowed to make the TALKGROUP 1 call from SITE 2 since RADIO-2 is no longer valid at SITE 2.
- Step 7. Switch RADIO-1 to TALKGROUP 2 and initiate a TALKGROUP 2 call from RADIO-3. Verify that RADIO-3 is allowed to make the TALKGROUP 2 call.
- Step 8. Set SITE 2 to be a non-valid site for TALKGROUP 2.
- Step 9. Initiate a TALKGROUP 2 call from RADIO-3. Verify that RADIO-3 receives a reject, and roams to a valid site. RADIO-3 is not allowed to make the TALKGROUP 2 call from SITE 2 since TALKGROUP 2 is no longer valid at SITE 2.
- Step 10. Return all settings to the original state.

Pass____ Fail____



3600 SITES ON ASTRO 7.X (SMARTX) FATP AND SATP

7.7.53 Talkgroup Call - Mixed Mode Call Types with 3600 Trunking Site

1. DESCRIPTION

The Talkgroup is the primary level of organization for communications on a trunked radio system. Radios with Talkgroup call capability will be able to communicate with other members of the same Talkgroup. This provides the effect of a private channel down to the Talkgroup level.

This test will demonstrate that existing sites using mixed mode talkgroup types will continue to operate with mixed mode capabilities.

SETUP

RADIO-1 - TALKGROUP 4 (Analog Talkgroup)
RADIO-1 - SITE - SMARTX SITE 1
RADIO-2 - TALKGROUP 4 (Analog Talkgroup)
RADIO-2 - SITE - SMARTX SITE 2
RADIO-3 - TALKGROUP 3 (Digital Mode Talkgroup)
RADIO-3 - SITE - SMARTX SITE 1
RADIO-4 - TALKGROUP 3 (Digital Mode Talkgroup)
RADIO-4 - SITE - SMARTX SITE 2
CONSOLE-1 - TALKGROUP 4, TALKGROUP 3
CONSOLE-2 - TALKGROUP 4, TALKGROUP 3
(TALKGROUP 4 is an analog talkgroup,
TALKGROUP 3 is a digital talkgroup)

VERSION #1.020

2. TEST

- Step 1. Initiate a Wide Area Call with RADIO-1 in TALKGROUP 4.
- Step 2. Observe that RADIO-2, CONSOLE-1 and CONSOLE-2 can monitor and respond appropriately to the call.
- Step 3. Initiate a Wide Area Call with RADIO-3 in TALKGROUP 3.
- Step 4. Observe that RADIO-4, CONSOLE-1 and CONSOLE-2 can monitor and respond appropriately to the call.

Pass_____ Fail_____



SITE TRUNKING FDMA/TDMA MIXED SITES

7.7.54 Site Trunking Indication

1. DESCRIPTION

When a remote site loses its link or does not have a link to the Zone Controller, the affected site will enter "Site Trunking" mode of operation. Radios locked onto this site will be serviced locally within this site's coverage area.

NOTE: If the subscriber does not have the Display option, the "Site Trunking" indication will not be displayed.

SETUP

RADIO-1 - TALKGROUP 1

RADIO-1 - SITE - SITE 1

RADIO-2 - TALKGROUP 2

RADIO-2 - SITE - SITE 1

Lock the subscribers to SITE 1 if more than one site exists on the system.

VERSION #1.010

2. TEST

- Step 1. Place SITE 1 into the Site Trunking mode.
- Step 2. Verify that RADIO-1 and RADIO-2 are displaying the "Site Trunking" indication.
- Step 3. Return the site to Wide Area Trunking unless the next test requires Site Trunking.

Pass____ Fail____



Site Trunking FDMA/TDMA Mixed Sites

7.7.55 Call Alert

1. DESCRIPTION

Call Alert is a tone page that allows a user to selectively alert another radio unit. When a site is in Site Trunking, Radios at the site will only be able to Call Alert other radios at the same site. The initiating radio will receive notification from the trunked system as to whether or not the page was received by the target radio.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 2
RADIO-2 - SITE - SITE 1

Note: All Radios should be "Site Locked"

VERSION #1.010

2. TEST

- Step 1. Place SITE 1 into the Site Trunking mode.
- Step 2. Using RADIO-1, press the page button.
- Step 3. Enter the Unit ID of RADIO-2 with the keypad, or scroll to the location where this ID is stored.
- Step 4. Press the PTT to initiate the Call Alert.
- Step 5. Verify that RADIO-2 received the Call Alert.
- Step 6. Exit the Call Alert mode and return to normal talkgroup mode.
- Step 7. Return the site to Wide Area Trunking unless the next test requires Site Trunking.

Pass____ Fail____



Site Trunking FDMA/TDMA Mixed Sites

7.7.56 Continuous Assignment Updating

1. DESCRIPTION

When a talkgroup is assigned a voice channel, the site controller continues to transmit the channel assignment on the control channel for the duration of the Talkgroup Call. Radios coming into use on the system are automatically sent to voice channels with conversations in progress involving their selected talkgroups.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 1
RADIO-2 - SITE - SITE 1
RADIO-3 - TALKGROUP 1
RADIO-3 - SITE - SITE 1

Note: All Radios should be "Site Locked"

VERSION #1.010

2. TEST

- Step 1. Place SITE 1 into the Site Trunking mode.
- Step 2. Turn OFF RADIO-1.
- Step 3. Initiate a Talkgroup Call using RADIO-2.
- Step 4. While the Talkgroup Call is in progress, turn on RADIO-1.
- Step 5. Observe that RADIO-1, which was just brought back into service, joins the Talkgroup Call already in progress.
- Step 6. Release the PTT of RADIO-2. Switch RADIO-1 to TALKGROUP 2.
- Step 7. Initiate a Talkgroup Call using RADIO-2.
- Step 8. While the Talkgroup Call is in progress, turn RADIO-1 back to TALKGROUP 1.
- Step 9. Observe that RADIO-1, which was just set back to TALKGROUP 1, joins the Talkgroup Call already in progress.
- Step 10. Return the site to Wide Area Trunking unless the next test requires Site Trunking.

Pass_____ Fail_____



Site Trunking FDMA/TDMA Mixed Sites

7.7.57 Private Call

1. DESCRIPTION

Private Call is a selective calling feature that allows a dispatcher or radio user to carry on one-to-one conversation that is only heard by the 2 parties involved. When a site is in Site Trunking, Radios at the site will only be able to Private Call other radios at the same site.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 1
RADIO-2 - SITE - SITE 1
RADIO-3 - TALKGROUP 1
RADIO-3 - SITE - SITE 1

Note: All Radios should be "Site Locked"

VERSION #1.020

2. TEST

- Step 1. Place SITE 1 into the Site Trunking mode.
- Step 2. Using RADIO-1, press the Private Call button.
- Step 3. Enter the Unit ID of RADIO-2 with the keypad, or scroll to the location where this ID is stored.
- Step 4. Press the PTT to initiate the call.
- Step 5. Verify that at RADIO-2 only tones are heard and the display indicates that a call has been received.
- Step 6. Answer the call at RADIO-2 by pressing the Private Call/Respond button. Verify its display shows the ID number or alias of the calling unit.
- Step 7. Press the PTT switch on RADIO-2 and respond to the call. Note that if you do not press the Private Call button before pressing PTT, your audio will be heard by all members of the talkgroup, and not by the radio initiating the Private Call.
- Step 8. Verify only RADIO-1 hears the audio from RADIO-2.
- Step 9. End the Private Call. Return the site to Wide Area Trunking unless the next test requires Site Trunking.

Pass____ Fail____



Site Trunking FDMA/TDMA Mixed Sites

7.7.58 Talkgroup Call (Single Site)

1. DESCRIPTION

When a site goes into Site Trunking, radios with Talkgroup Call capability will be able to communicate with other members of the same talkgroup at that same site. (Members of the same talkgroup at other sites will not be able to monitor those conversations.)

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 1
RADIO-2 - SITE - SITE 1
RADIO-3 - TALKGROUP 2
RADIO-3 - SITE - SITE 1
RADIO-4 - TALKGROUP 2
RADIO-4 - SITE - SITE 1

* All Radios should be "Site Locked"

VERSION #1.010

2. TEST

- Step 1. Place SITE 1 into the Site Trunking mode.
- Step 2. Initiate a Talkgroup Call with RADIO-1 on TALKGROUP 1 at SITE 1.
- Step 3. Observe that only RADIO-2 will be able to monitor and respond to the call. Note that RADIO-3 AND RADIO-4 are not able to monitor the call since they are on another Talkgroup.
- Step 4. Initiate a Talkgroup Call with RADIO-3 on TALKGROUP 2 at SITE 1.
- Step 5. Observe that only RADIO-4 will be able to monitor and respond to the call.
- Step 6. Return the site to Wide Area Trunking unless the next test requires Site Trunking.

Pass_____ Fail_____



Site Trunking FDMA/TDMA Mixed Sites

7.7.59 Dynamic FDMA/TDMA Talkgroup Call

1. DESCRIPTION

When a Site goes into Site Trunking, radios with Talkgroup Call capability will be able to communicate with other members of the same talkgroup at that same site. Members of the same talkgroup at other sites will not be able to monitor those conversations. The Site Controller determines the FDMA/TDMA mode of a Talkgroup call depending on the capabilities of the radios registered at the site to the talkgroup.

Note: The FDMA/TDMA mode of a call cannot change during a PTT.

SETUP

RADIO-1 (TDMA) - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 (TDMA) - TALKGROUP 1
RADIO-2 - SITE - SITE 1
RADIO-3 (TDMA) - TALKGROUP 1
RADIO-3 - SITE - SITE 2
RADIO-8 - TALKGROUP 1
RADIO-8 (FDMA-only) - SITE - SITE 1

Note: All Radios should be "Site Locked"

VERSION #1.010

2. TEST

- Step 1. Place SITE 1 into Site Trunking. Turn RADIO-5 off.
- Step 2. Initiate a Talkgroup Call with RADIO-1 on TALKGROUP 1 at SITE 1.
- Step 3. Observe that only RADIO-2 will be able to monitor and respond to the call. Note that RADIO-3 is not able to monitor the call since SITE 1 is not in wide area operation. Observe that the channel is assigned in the TDMA mode.
- Step 4. With the RADIO-1 talkgroup call in progress, turn on RADIO-8.
- Step 5. Observe that RADIO-2 continues to monitor and is still able to respond to the call. Observe that the channel is still assigned in the TDMA mode.
- Step 6. Dekey RADIO-1. Observe that the call is transmission trunked.
- Step 7. Initiate a talkgroup call with RADIO-1 on TALKGROUP 1.
- Step 8. Observe that now RADIO-2 and RADIO-8 will be able to monitor and respond to the call. Observe that the channel is assigned in the FDMA mode.
- Step 9. Return the site to Wide Area Trunking unless the next test requires Site Trunking.

Pass_____ Fail_____



Site Trunking FDMA/TDMA Mixed Sites

7.7.60 Dynamic FDMA/TDMA Busy Queue Conversion

1. DESCRIPTION

If no voice channel resources are available, radios requesting channels for new conversations are placed in a queue. Users of the same priority will move through the queue in a first in, first out sequence.

When a voice channel becomes available, the radio at the top of the busy queue gets a channel assignment and generates a callback tone if the FDMA/TDMA mode of the call can be supported by the available resource. While the call is waiting in the busy queue, the FDMA/TDMA mode of a talkgroup at a site in site trunking can be change as radios join or leave the talkgroup.

NOTE: All radios and talkgroups should start with default priorities. The Default is 10.

SETUP

RADIO-1 (TDMA) - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-8 (FDMA-only) - TALKGROUP 1
RADIO-8 - SITE - SITE 1
RADIO-9 (FDMA-only) - TALKGROUP 2
RADIO-9 - SITE - SITE 1

VERSION #1.020

2. TEST

- Step 1. Place SITE 1 into Site Trunking and simulate a busy system by disabling all channels at SITE 1 with the exception of the control channel and one voice channel. Turn off RADIO-8
- Step 2. Initiate a Talkgroup Call with RADIO-9 and keep the call in progress until instructed to end it.
- Step 3. Key RADIO-1 and observe that the radio receives a busy.
- Step 4. Dekey RADIO-9 and observe that RADIO-1 receives a callback and can make the call. Observe that the channel is assigned through CSS in the TDMA mode since there are no FDMA-only radios in the call
- Step 5. Dekey RADIO-1.
- Step 6. Initiate a Talkgroup Call with RADIO-9 and keep the call in progress until instructed to end it.
- Step 7. Turn on RADIO-8.
- Step 8. Key RADIO-1 and observe that the radio receives a busy.
- Step 9. Dekey RADIO-9 and observe that RADIO-1 receives a callback and can make the call. Observe that the channel is now assigned in the FDMA mode.
- Step 10. Return the site to Wide Area Trunking unless the next test requires Site Trunking.

Pass_____ Fail_____



Site Trunking FDMA/TDMA Mixed Sites

7.7.61 Dynamic FDMA/TDMA Emergency Alarm and Call

1. DESCRIPTION

Users in life threatening situations can use the Emergency button on the radio to immediately send a signal to the dispatcher and be assigned the next available voice channel if the FDMA/TDMA mode of the call can be supported by the available resource. Otherwise, the first call in the queue that can be supported by the available resources is assigned. To demonstrate this, an Emergency Alarm and Call will be initiated from a subscriber which will be received by a subscriber affiliated at any site of any zone in the system. In this case, the first available resource CANNOT support the FDMA call mode.

Note: In Site Trunking, the mode of all calls is dynamically determined by the Site Controller and Emergency Call operation is always Top of Queue. If the subscriber does not have the Display option, the Emergency ID will not be displayed.

SETUP

RADIO-1 (TDMA) - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-3 (TDMA) - TALKGROUP 2
RADIO-3 - SITE - SITE 1
RADIO-4 (TDMA) - TALKGROUP 3
RADIO-4 - SITE - SITE 1
RADIO-5 (TDMA) - TALKGROUP 4
RADIO-5 SITE - SITE 1
RADIO-8 (FDMA-only) - TALKGROUP 1
RADIO-8 - SITE - SITE 1

Note: All Radios should be "Site Locked"

VERSION #1.010

2. TEST

- Step 1. Place SITE 1 into the Site Trunking mode. Simulate a busy system by disabling all channels at SITE 1 with the exception of the control channel and one voice channel.
- Step 2. Initiate calls with both RADIO-3 and RADIO-5 and keep these calls in progress until instructed to release.
- Step 3. Key RADIO-4 and verify the radio receives a busy tone.
- Step 4. Using RADIO-1 send an Emergency Call by pressing the emergency switch and then the PTT switch.
- Step 5. Observe that RADIO-1 cannot transmit due to the voice channel being busy. End the call on RADIO-3.
- Step 6. Observe that RADIO-4 receives the call back before RADIO-1 and is able to proceed with the call because the available channel resource can only support a TDMA call.
- Step 7. Dekey RADIO-5 and RADIO-4. Observe that RADIO-1 receives the callback and is able to proceed with the call.
- Step 8. Observe that the display on RADIO-8 denotes an emergency and the unit ID or alias of RADIO-1.
- Step 9. Dekey RADIO-1 and end the Emergency Call by holding down the Emergency button on RADIO-1 until an alert tone sounds. Verify RADIO-1 returns to normal operation.
- Step 10. Return the site to Wide Area Trunking unless the next test requires Site Trunking.

Pass____ Fail____



Site Trunking FDMA/TDMA Mixed Sites

7.7.62 Wide Area Recovery

1. DESCRIPTION

A site in Site Trunking will transition to Wide Area Trunking when all failures have been cleared. All subscribers should transition from Site Trunking to Wide Area Trunking and continue to process calls.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 1
RADIO-2 - SITE - SITE 1
RADIO-3 - TALKGROUP 1
RADIO-3 - SITE - SITE 2
RADIO-4 - TALKGROUP 1
RADIO-4 - SITE - SITE 2
CONSOLE-1 - TALKGROUP 1

Note: All Radios should be "Site Locked"

VERSION #1.020

2. TEST

- Step 1. Set the status of SITE 1 to Wide Area and clear any system errors that may have placed SITE 1 into Site Trunking.
- Step 2. Verify that the status of SITE 1 has transitioned into Wide Area Trunking.
- Step 3. Verify that RADIO-1 and RADIO-2 no longer display Site Trunking.
- Step 4. Verify Wide Area communications between RADIO-1, RADIO-2, RADIO-3, RADIO-4 and CONSOLE-1.

Pass____ Fail____



RADIO CONTROL MANAGER (RCM) FEATURES FATP AND SATP

7.7.63 Dynamic Regrouping (Single Site)

RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 1
RADIO-2 - SITE - SITE 1
RADIO-3 - TALKGROUP 2
RADIO-3 - SITE - SITE 1
RADIO-4 - TALKGROUP 2
RADIO-4 - SITE - SITE 1

1. DESCRIPTION

VERSION #1.020

Dynamic Regrouping allows the Radio Control Manager (RCM) to assign individual radios operating in different talkgroups to a temporary talkgroup via the Regroup command. Network managers or supervisors can override individual radio talkgroup selections by steering regrouped subscribers to a new talkgroup containing users which need to communicate on a temporary basis. After receiving a Regroup command, a radio will ignore the current setting of the talkgroup selector and move to the target talkgroup specified in the Regroup command. Unless the supervisor issues a LOCK command, the radio user can deselect the target talkgroup by selecting another talkgroup using the radio selector. A unique location on the radio selector is reserved for the target talkgroup following a Regroup command.

Dynamic Regrouping assignments can be initiated rapidly, but not instantaneously. Regrouping is best suited for planned activities or occasional changes from normal routines. It is not intended for immediate responses such as high speed chases or for a rapid deployment on a per incident basis.

Regrouped radios receiving a second Regroup command will move to the new target talkgroup specified in the second command. When a regrouped radio receives a Regroup command, all information pertaining to the previous Regroup command is lost. A Cancel Regroup command or a Revert returns an individual radio to its normal operation.

Note - RCM user must be attached to primary and target talkgroup.

SETUP

RADIO-1 - TALKGROUP 1

PALM BEACH COUNTY RADIO SYSTEM

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2. TEST

- Step 1. With the RCM open from the Commands menu item select the Radio Commands item to open the command window. Choose Regroup.
- Step 2. Enter TALKGROUP 3 in the target field.
- Step 3. Enter the IDs or aliases of RADIO-1, RADIO-2, RADIO-3 and RADIO-4.
- Step 4. Once all desired radio information is entered and appears in the command window click the Regroup button to initiate the command.
- Step 5. Observe all radios are regrouped and are able to communicate on TALKGROUP 3.
- Step 6. Switch the Subscriber to the Dynamic Regroup channel to acknowledge the group request.
- Step 7. Observe that the radios are able to select different talkgroups and are not locked onto the regrouped mode. Note- The Talkgroup selector knob has to be set to the dynamic regroup position before switching to any other talkgroup.
- Step 8. Observe that the Regroup task appears in the Command Monitor window.
- Step 9. Issue a Selector Lock command all four radios and verify their selectors have been locked.
- Step 10. Revert both commands and verify the radios have returned to normal operation.

Pass____ Fail____



Radio Control Manager (RCM) Features

7.7.64 Emergency Alarm Display (Single Site)

1. DESCRIPTION

The emergency call information that is displayed on the Radio Control Manager (RCM) includes the radio alias of the radio that initiated the Emergency Alarm, the talkgroup that the radio was affiliated to at the time the alarm was sent, and the time the alarm was received.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 1
RADIO-2 - SITE - SITE 1

One RCM, which has TALKGROUP 1 attached is required.

VERSION #1.020

2. TEST

- Step 1. Open the Radio Control Manager (RCM) window(s) and verify that the Emergency Alarm window is visible. If it is not, go to the View menu and select it bringing it into the RCM viewable area.
- Step 2. Initiate an Emergency Alarm from RADIO-1.
- Step 3. Observe that the RCM receives the Emergency Alarm.
- Step 4. Acknowledge the Emergency by selecting the Emergency in the window and clicking on the Respond button.
- Step 5. Verify the window displays the radio alias, the talkgroup, and the time the alarm was received.
- Step 6. Again, select the displayed Emergency and click the Delete button to clear the emergency.
- Step 7. Reset the radio by holding the Emergency button until the radio clears.
- Step 8. Repeat Steps 1-7 using RADIO-2.

Pass____ Fail____



Radio Control Manager (RCM) Features

7.7.65 Radio Check (Single Site)

1. DESCRIPTION

Radio Check is a Radio Control Manager (RCM) command used to verify that a radio is active in the trunking system. The Radio Check command causes the Zone Controller to poll for the radio requesting that the radio re-affiliate. When the radio re-affiliates, the RCM then has the knowledge that the radio is powered on and within system range. If the radio is involved in a conversation, whether group or interconnect, the RCM application displays a message to that effect.

The information displayed by the RCM in response to the Radio Check command is: current talkgroup affiliation, the multigroup that the talkgroup is attached to (assuming the talkgroup belongs to a multigroup), and the site where the radio is affiliated. If the radio does not respond to the Radio Check command, a message to that effect displays.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 1
RADIO-2 - SITE - SITE 1

VERSION #1.020

2. TEST

- Step 1. Select the Command menu and then select the Radio Check item to open the Radio Check window.
- Step 2. Enter the ID or alias of RADIO-2 into the entry box and click the Apply button.
- Step 3. Observe the radio is polled and the current radio information is displayed on the RCM.
- Step 4. Turn off RADIO-1.
- Step 5. Enter the ID or alias of the RADIO-1 into the entry box and click the Apply button.
- Step 6. Observe that the RCM displays "Radio Not Found."
- Step 7. Depress and hold the PTT button of RADIO-2 until instructed to release.
- Step 8. Enter the ID or alias of RADIO-2 into the entry box and click the Apply button. Observe that a busy for the radio is displayed on the RCM.
- Step 9. Release the PTT button on RADIO-2.
- Step 10. Observe the radio is polled and the current radio information is displayed on the RCM.

Pass_____ Fail_____



Radio Control Manager (RCM) Features

7.7.66 Radio Snapshot

1. DESCRIPTION

Snapshot is a Radio Control Manager (RCM) command used to retrieve information about an individual radio. Information provided by the RCM application in response to the Snapshot command includes: the serial number of the radio, current talkgroup/multigroup and site affiliations; the Regroup, Inhibit, and Selector Lock state of the radio. Snapshot information is taken from the system databases. The Snapshot command does not initiate any communication with the target radio.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 1
RADIO-2 - SITE - SITE 2
RADIO-3 - TALKGROUP 2
RADIO-3 - SITE - SITE 3

* RADIO-1 and RADIO-3 must be programmed with Dynamic Regrouping capability.

*Make sure Radio Users are configured with a "Radio Primary Talkgroup Assignment" in the UCM.

VERSION #1.020

2. TEST

- Step 1. Submit a Dynamic Regroup command for RADIO-1 and RADIO-3 to be regrouped to TALKGROUP 3.
- Step 2. At the RCM, initiate the Snapshot command for RADIO-1.
- Step 3. Verify that the RCM shows RADIO-1 affiliated to SITE 1 and that its current Regroup state is "Regroup."
- Step 4. At the RCM, revert the dynamic regrouping on RADIO-1 and RADIO-3.
- Step 5. Initiate the Snapshot command for RADIO-1.
- Step 6. Verify RADIO-1 shows an affiliation to SITE 1 and that its current Regroup state is "Cancel Regroup."
- Step 7. At the RCM, inhibit RADIO-2 and then initiate the Snapshot command for RADIO-2.
- Step 8. Verify RADIO-2 shows an affiliation to SITE 2 and that its current Inhibit state is "Selective Inhibit."
- Step 9. At the RCM, revert RADIO-2 and then initiate the Snapshot command for RADIO-2.
- Step 10. Verify RADIO-2 shows an affiliation to SITE 2 and that its current Inhibit state is "Cancel Inhibit."

Pass____ Fail____



Radio Control Manager (RCM) Features

7.7.67 Radio Status

1. DESCRIPTION

This optional feature allows the Radio Control Manager (RCM) to view status information sent in by subscribers. Statuses are used to indicate the Radio operator's operational state (e.g. off duty). The information that will be displayed includes the radio alias, talkgroup alias, hour and minute time stamp, status number or message number, and the customer entered translation for the specific status. Status input is displayed in chronological order, independent of the type of status number.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1

Pass____ Fail____

* Configure RADIO-1 in the manager to use a particular status set.

* Configure the assigned status set (via the status set manager configuration objects) to include text translations for a few different statuses.

* The RCM user needs to be assigned the dispatch attachment group that matches the radio user's assigned dispatch attachment group.

VERSION #1.020

2. TEST

Step 1. Initiate a Status transmission from RADIO-1.

Step 2. Verify the RCM displays the proper Status text.



Radio Control Manager (RCM) Features

7.7.68 Selective Radio Inhibit

1. DESCRIPTION

The INHIBIT command issued by the Radio Control Manager (RCM) disables a radio, preventing it from transmitting or receiving any audio. All of the radio's functionality ceases while a radio is inhibited by the RCM. Once inhibited, the radio cannot be used to monitor voice channels or for any other radio user initiated activity. Note that an inhibited radio still monitors the control channel so that it can be re-enabled with the Cancel Inhibit command. Upon receiving the Cancel Inhibit command from the RCM, the radio returns to its normal operation.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1

VERSION #1.020

2. TEST

- Step 1. From the Radio Control Manager select the Commands menu and then select the Radio Commands item in the menu to open the Command Window.
- Step 2. Enter the IDs or aliases of RADIO-1.
- Step 3. Select "Selective Inhibit" from the command pull down menu.
- Step 4. Once all desired radio information is entered and appears in the command window click the submit button to initiate the command.
- Step 5. Observe RADIO-1 is inhibited and appears to be dead.
- Step 6. Observe that the Inhibit task appears in the Command Monitor window.
- Step 7. Cancel the Inhibit by selecting the task in the Command Monitor window and clicking the Revert button to submit the task.
- Step 8. Observe that the Cancel Inhibit task appears in the Command Monitor window and that RADIO-1 is returned to normal operation.

Pass____ Fail____



FAULT MANAGEMENT FATP AND SATP

7.7.69 Unified Event Manager - Views

1. DESCRIPTION

The Unified Event Manager (UEM) provides three different views. The purpose of this test is to demonstrate the views available from the UEM.

For A7.14: Custom views can be saved and retrieved by other NM Client users. This test demonstrates this capability, as well as demonstrating an improvement in display of Channel information.

SETUP

NMclient01 - UEM session up and running.

VERSION #1.050

2. TEST

- Step 1. The first view is the Active Alarms. In the navigation pane expand Fault Management and select Network Events.
- Step 2. Customize the Active Alarms display by selecting the View option from the menu bar, then select Search.
- Step 3. Perform a Managed Resource search for channels, site controllers and routers by entering "Contains" and ch, sc, and z00 respectively in the search fields to perform the three separate searches.
- Step 4. For each of the three searches a filtered alarm view is displayed that contains alarms for the appropriate device in the search.
- Step 5. The second view is the Physical Summary view. In the navigation pane, expand Zone Maps and select Physical Summary. The Physical Summary View provides an aggregated alarm severity status of the devices located at all subnets in the Zone.
- Step 6. The third view is the Service Summary. In the navigation pane, under Zone Maps select Service Summary. The Service Summary View provides a quick summary of the service status of sites in a Zone, including access to Channel status.
- Step 7. In the main UEM window is an Alarm Summary View pane. In the Alarm Summary View, select the format for the desired view, pie, tabular or bar.
- Step 8. Create a custom view. View the Active Alarms display to see result. Perform right click on the Network Events tree node in the navigation window and select export function. Select filter view, and provide a target location to save the custom view tree structure on NM Client.
- Step 9. Log out of the UEM application, and log back in as a different user. Retrieve the custom view saved in step 8. View the Active Alarms display to see the same view.
- Step 10. Navigate Network Database, select Repeater/Conventional Site and from Managed Resources menu, select Managed Resource Properties. Choose channel tab to display all channel status.

Pass____ Fail____



Fault Management

7.7.70 Station Power Amp Failure Reports to the Unified Event Manager (UEM)

1. DESCRIPTION

This test will demonstrate that the Unified Event Manager (UEM) alarms view is able to capture information about various failures at the system and zone level.

A station will be keyed while the output is unloaded to simulate a power amp failure. The failures will be monitored on the UEM.

Note: For safety, either power down the station or TX Inhibit it before disconnecting or re-connecting the dummy load to prevent accidental keying of the station.

Note: This test should be done on a site with more than 2 channels. Failsoft will occur if the test is done on a 2 channel site.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 2
RADIO-2 - SITE - SITE 1
NMclient01 - UEM session up and running.

* All Radios should be "Site Locked"

VERSION #1.020

2. TEST

- Step 1. Verify that the power amp of the station to be tested has no active alarms against it.
- Step 2. Disconnect the dummy load/antenna from the station.
- Step 3. Make several talkgroup calls using RADIO-1 until the test station has been keyed.
- Step 4. Observe that an alarm indicating a Power Amp failure appears on the UEM alarms view. For SmartX sites you will need to look at event view to see cause of alarm.
- Step 5. Reconnect the dummy load/antenna disconnected in Step 3.
- Step 6. In approximately 5 minutes, observe the changes to the alarm on the UEM, indicating the module is restored to service.

Pass____ Fail____



Fault Management

7.7.71 Core Router Failure Reports to the Unified Event Manager

1. DESCRIPTION

This test will demonstrate that the Unified Event Manager (UEM) alarms view is able to capture information about various failures at the system and zone level.

A Core Router/Gateway will be powered off to simulate a failure. The system health will be monitored on UEM.

SETUP

NMclient01 - UEM session up and running.

VERSION #1.040

2. TEST

- Step 1. Verify that the Router/Gateway to be tested displays without failures (normal) on UEM. The core router is contained in the specific subnet that it is physically collocated with in the network.
- Step 2. Power down the Router/Gateway.
- Step 3. Observe that an alarm indicating a Router/Gateway failure appears on the UEM alarms view.
- Step 4. Restore power to the Router/Gateway.
- Step 5. Observe the changes to the alarm in UEM, indicating the Router/Gateway is enabling.
- Step 6. Observe that alarm view updates in the UEM, indicating the Router/Gateway has recovered and is enabled.

Pass____ Fail____



Fault Management

7.7.72 Site Path Failure (T1) Reports to the Unified Event Manager

1. DESCRIPTION

This test will demonstrate that the Unified Event Manager (UEM) alarms view is able to capture information about various failures at the system and zone level.

This test simulates a microwave failure by removing a customer selected site data link and monitoring the alerts.

Note: If using a Simulcast site, this test refers to the Prime Site links. While failures would be seen at the subsite level if a Subsite link were failed, the site would not drop into Site Trunking.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
NMclient01 - UEM session up and running.

* RADIO-1 should be "Site Locked"

VERSION #1.020

2. TEST

- Step 1. Remove the T1 cable(s) to the SITE 1 router(s) (If Simulcast, this refers to the Prime Site router(s)) at the site where RADIO-1 is affiliated. Be certain to remove the T1 cable from both routers if redundant site links are being utilized.
- Step 2. Observe the UEM reports CommFailure alarms for the devices at the affected site.
- Step 3. In addition, observe that the site is now in the Site Trunking mode.
- Step 4. Reconnect the T1 cable(s) disconnected in Step 1.
- Step 5. Observe the site returns to the Wide Area Trunking mode.
- Step 6. Observe the topology and alarms that appear on the UEM indicating the site has recovered.

Pass_____ Fail_____



Fault Management

7.7.73 Site Path Failure (Ethernet) Reports to the Unified Event Manager

1. DESCRIPTION

This test will demonstrate that the Unified Event Manager (UEM) alarms view is able to capture information about various failures at the system and zone level.

This test simulates a microwave/transport failure by removing a customer selected site data link and monitoring the alerts.

Note: If using a Simulcast site, this test refers to the Prime Site links. While failures would be seen at the subsite level if a Subsite link were failed, the site would not drop into Site Trunking.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
NMclient01 - UEM session up and running.

* RADIO-1 should be "Site Locked"

VERSION #1.030

2. TEST

- Step 1. Remove the Ethernet cable(s) to the SITE 1 router(s) (If Simulcast, this refers to the Prime Site router(s)) at the site where RADIO-1 is affiliated. Be certain to remove the Ethernet cable from both routers if redundant site links are being utilized.
- Step 2. Observe the UEM reports CommFailure alarms for the devices at the affected site.
- Step 3. In addition, observe that the site is now in the Site Trunking mode.
- Step 4. Reconnect the Ethernet cable(s) disconnected in Step 1.
- Step 5. Observe the site returns to the Wide Area Trunking mode.
- Step 6. Observe the topology and alarms/events that appear in the UEM, indicating the site is in recovery and after a period of time has recovered.

Pass_____ Fail_____



Fault Management

7.7.74 Voice Processor Module "No Console IP Address" Fault Reports to the Unified Event Manager

1. DESCRIPTION

This test will demonstrate that the Voice Processor Module (VPM) reports the condition when it does not have an IP address for the Console PC configured. This event is viewable in the Unified Event Manager (UEM).

SETUP

No prior setup is needed.

VERSION #1.020

2. TEST

- Step 1. From the Unified Network Configurator (UNC), prepare the new configuration file for the VPM (using the invalid address 0.0.0.0).
- Step 2. Push the configuration to the VPM.
- Step 3. From Unified Event Manager (UEM), observe that the Console PC reports the link to the VPM as Down.
- Step 4. From UEM, observe that the VPM reports a CRITICAL alarm "Console IP address is not configured."
- Step 5. From the UNC, prepare and push a new configuration which includes the valid IP address of the Console PC.
- Step 6. From UEM, observe that the Console PC reports the link to the VPM as Up, and that the CRITICAL alarm reported by the VPM is cleared.

Pass____ Fail____



Fault Management

7.7.75 Console Site Control Path (T1/E1) Failure Monitored by Unified Event Manager

1. DESCRIPTION

This test will demonstrate that the Unified Event Manager (UEM) is able to capture information about various failures at the system and zone level.

This test simulates a failure by removing the Console Site link(s). The alerts will be monitored at the Unified Event Manager.

SETUP

RADIO-1 TALKGROUP 1
RADIO-1 - SITE - SITE 1

CONSOLE-1 TALKGROUP 1
CONSOLE-1 - SITE - CONSITE 1

VERSION #1.030

2. TEST

- Step 1. Initiate a Talkgroup call on TALKGROUP 1 by hitting the PTT on RADIO-1 and verify communication with CONSOLE-1.
- Step 2. Remove the T1 or E1 cable(s) to the Console Site router(s) at CONSITE 1. Be certain to remove the T1 or E1 cable from both routers if redundant site links are being utilized.
- Step 3. Observe the alert appears in the UEM indicating the Console Site Link has failed.
- Step 4. Observe the color for the console site container turns from green (normal) to Black for loss of communications.
- Step 5. Observe that CONSOLE-1 is no longer able to contact RADIO-1 on TALKGROUP 1.
- Step 6. Connect the T1 or E1 cable(s) previously disconnected in step 2.
- Step 7. Observe that the Console is now able to contact RADIO-1.
- Step 8. Observe that the color for the site changes to Green (normal) at the UEM.

Pass____ Fail____



OVER THE AIR REKEYING (OTAR) FATP AND SATP

7.7.76 CKR Update (Bulk Update)

1. DESCRIPTION

New encryption keys assigned to a CKR are sent via OTAR using the CKR Update command. All devices managed by the Key Management Facility (KMF) that use the CKR are updated by the KMF. (Update methods for various devices might include OTAR, OTEK, S&F or Manual Keyloading determined by configuration, capabilities and/or security policies).

Note: Ensure all devices under test are registered and communicable from the KMF; i.e. Hello command is successful.

SETUP

RADIO-1 TALKGROUP 1 (Secure Mode)
RADIO-2 TALKGROUP 1 (Secure Mode)
RADIO-3 TALKGROUP 1 (Secure Mode)

All radios under test are able to communicate securely on TALKGROUP 1.

All radios under test are current in the KMF.

VERSION #1.040

2. TEST

- Step 1. Confirm successful communications on TALKGROUP 1 among all radios under test.
- Step 2. Modify the CKR assigned to the talkgroup under test such that both keysets are assigned new TEKs. It is critical that both TEKs within the CKR are changed to different keys.
- Step 3. From the Radio menu of the KMF, select RADIO-1 and RADIO-3 and select the full update option.
- Step 4. From the Event Viewer in the KMF Client window, verify that RADIO-1 and RADIO-3 are shown under Operation Type. The operations are complete when the Operation Status is Complete and the Operation Progress is 100%.
- Step 5. The radios will now have the new keys within the CKR. Double-click on RADIO-1 in the list and verify that its status is marked current. Verify that RADIO-3 is also current.
- Step 6. Now that RADIO-1 and RADIO-3 have been updated, verify secure communications between RADIO-1, and RADIO-3. Also Verify that RADIO-2 does not communicate securely to RADIO-1 or RADIO-3 because of the key mismatch.
- Step 7. Revert the system by setting CKR TEKs back to their original state and send the update to RADIO-1 and RADIO-3.
- Step 8. Verify successful communications on TALKGROUP 1 among all radios under test.

Pass_____ Fail_____



Over The Air Rekeying (OTAR)

7.7.77 Clear Hello

1. DESCRIPTION

The KMF operator can send a message to any radio to confirm that radio is on the system.

Note: The devices under test must have a valid air address registered with the KMF and must be accessible on the data system.

SETUP

RADIO-1 TALKGROUP 1

RADIO-1 must not be configured for enhanced security mode in either radio programming or the KMF.

VERSION #1.030

2. TEST

- Step 1. From the KMF Client window, select the Security menu and then the Radios menu item.
- Step 2. Select RADIO-1 from the list.
- Step 3. Click the 'Clear Hello' button, or right-click and choose 'Clear Hello.'
- Step 4. From the Event Viewer in the KMF Client window, verify that RADIO-1 is shown under Operation Type. The operation is complete when the Operation Status is Complete and the Operation Progress is 100%.

Pass____ Fail____



Over The Air Rekeying (OTAR)

7.7.78 Encrypted Hello

1. DESCRIPTION

The KMF operator can send an encrypted message to any radio to confirm that radio is on the system and that its encryption services are functioning.

Note: The devices under test must have a valid air address registered with the KMF and must be accessible on the data system.

SETUP

RADIO-1 - TALKGROUP 1

Note: The radio must be current in the KMF

VERSION #1.020

2. TEST

- Step 1. From the KMF Client window, select the Security menu and then the Radios menu item.
- Step 2. Select RADIO-1 from the list.
- Step 3. Click the 'Encrypted Hello' button, or right-click and choose 'Encrypted Hello.'
- Step 4. From the Event Viewer in the KMF Client window, verify that RADIO-1 is shown under Operation Type. The operation is complete when the Operation Status is Complete and the Operation Progress is 100%.

Pass____ Fail____



Over The Air Rekeying (OTAR)

7.7.79 Full Update to Subscriber

1. DESCRIPTION

The entire set of encryption keys (in addition to other state parameters) are sent to a radio using the Full Unit Update command.

Note: The devices under test must have a valid air address registered with the KMF and must be accessible on the data system.

SETUP

RADIO-1 - TALKGROUP 1 (Secure Mode)
RADIO-2 - TALKGROUP 1 (Secure Mode)
RADIO-2 will be a reference radio.

Note: It is assumed that both radios under test are current with the KMF.

VERSION #1.030

2. TEST

- Step 1. Delete both TEKs from the CKR assigned to the talkgroup under test, from RADIO-1.
- Step 2. Using RADIO-1, verify when the subscriber is set to secure mode, the radio indicates a key fail.
- Step 3. From the KMF Client window, select the Security menu and then the Radios menu item.
- Step 4. Select RADIO-1 from the list.
- Step 5. Click the 'Full Update' button, or right-click and choose 'Full Update.'
- Step 6. From the Event Viewer in the KMF Client window, verify that RADIO-1 is shown under Operation Type. The operation is complete when the Operation Status is Complete and the Operation Progress is 100%. Note that a warmstart operation will occur if the TEK selected for the OTAR session is one of the TEKs assigned to CKR.
- Step 7. Now that RADIO-1 contains the keys in the CKR, verify secure communications between RADIO-1 and RADIO-2.

Pass____ Fail____



Over The Air Rekeying (OTAR)

7.7.80 Keyset Changeover

1. DESCRIPTION

The Changeover procedure is initiated by the KMF and is used to direct a radio or a group of radios to perform a keyset changeover. This procedure is used to direct radios and managed devices, system wide, to changeover from using one keyset to another keyset.

Note: The devices under test must have a valid air address registered with the KMF and must be accessible on the data system.

SETUP

RADIO-1 - TALKGROUP 1 (Secure Mode)
RADIO-2 - TALKGROUP 1 (Secure Mode)
RADIO-3 - TALKGROUP 1 (Secure Mode)

Make a note of the active keyset.

Any devices managed by the KMF that are not currently communicable by the KMF will appear as failures and/or retry opportunities (ROPs) throughout portions of this test.

VERSION #1.030

2. TEST

- Step 1. From the KMF Client window, select the Security menu and then the Keysets menu item.
- Step 2. Select the inactive keyset from the list and click the 'Set Active Keyset' button.
- Step 3. A window will pop up "Would you like to perform a keyset changeover at this time?"
- Step 4. Select the checkbox to perform a system wide keyset changeover.
Note: Not selecting a checkbox will require individual radios to be updated.
- Step 5. Depending on the size of the KMF database, the keyset changeover may take some time to complete. After the keyset changeover is complete, using RADIO-1's on screen menu or a KVL, verify that the keyset that was set to active is now the active keyset in the radio.
- Step 6. Verify communications between RADIO-1, RADIO-2 and RADIO-3 on TALKGROUP 1.

Pass____ Fail____



Over The Air Rekeying (OTAR)

7.7.81 Keyset Manipulation

1. DESCRIPTION

The KMF application provides an operator with two keysets to perform rekeying operations. Only one keyset can be active in a device at a time, and an operator is able to rename and activate either keyset as necessary. This feature enables an operator to perform rekeying operations without interrupting communications.

Note: The devices under test must have a valid air address registered with the KMF and must be accessible on the data system.

SETUP

RADIO-1 - TALKGROUP 1 (Secure Mode)

VERSION #1.020

2. TEST

- Step 1. From the KMF Client window, select the Security menu and then the Keysets menu item.
- Step 2. Double-click on the first keyset.
- Step 3. In the dialog box, change the Keyset Name and press the 'Save and Close' button.
- Step 4. Double-click on the second keyset.
- Step 5. In the dialog box, change the Keyset Name and press the 'Save and Close' button.
- Step 6. From the KMF Client window, select the Security menu and then the CKRs menu item. Select the CKR and click Open. Verify that the Keyset names have changed in the KMF.
- Step 7. Perform a Full Update on RADIO-1.
- Step 8. Use RADIO-1's screen or a KVL to verify the new keyset names exist in the radio.

Pass____ Fail____



Over The Air Rekeying (OTAR)

7.7.82 Locked Out

1. DESCRIPTION

The KMF operator can designate a radio as "Locked Out." When a radio has been locked out at the KMF, any rekey request from the radio user is denied and results in a "No Service" message from the KMF.

Note: The devices under test must have a valid air address registered with the KMF and must be accessible on the data system.

SETUP

RADIO-1 - TALKGROUP 1

Radio under test must have the Rekey Request option available and configured via CPS.

VERSION #1.030

2. TEST

- Step 1. From the KMF Client window, select the Security menu and then the Radios menu item.
- Step 2. Select RADIO-1 from the list.
- Step 3. Click the 'Open' button, or right-click and choose 'Open.'
- Step 4. Under the Radio Details section, check the 'Locked-Out' option.
- Step 5. Click on the 'Save and Close' button to end the process.
- Step 6. Initiate a Rekey Request from RADIO-1.
- Step 7. From the Event Viewer in the KMF Client window, verify that RADIO-1 is shown under Operation Type.
- Step 8. Verify that the Rekey Request from the radio user is denied and "No Service" will be displayed on KMF Event Viewer. Note that this will not impact normal voice operations, unless the radio does not have the correct TEKs. 'Locked out' denies the radio OTAR.
- Step 9. Return RADIO-1 to normal service by de-selecting the "Locked Out" option.

Pass_____ Fail_____



Over The Air Rekeying (OTAR)

7.7.83 Radio Enable

1. DESCRIPTION

A Key Management Facility (KMF) operator can select the previously inhibited radio and re-enable the voice communications and user ergonomics using the enable command.

Note: The devices under test must have a valid air address registered with the KMF and must be accessible on the data system.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 1

RADIO-1 is currently in the inhibited state.

Note: The radio must be current in the KMF

Note: RCM inhibits and OTAR inhibts work interchangeably. If the radio, that is properly programmed, has been inhibited with OTAR, it can be re-enabled with RCM.

VERSION #1.040

2. TEST

- Step 1. From the KMF Client window, select the Security menu and then the Radios menu item.
- Step 2. Select RADIO-1 from the list.
- Step 3. Click the 'Enable' button, or right-click and choose 'Enable.'
- Step 4. From the Event Viewer in the KMF Client window, verify that RADIO-1 is shown under Operation Type. The operation is complete when the Operation Status is Complete and the Operation Progress is 100%.
- Step 5. Verify that RADIO-1 can now communicate with RADIO-2.

Pass_____ Fail_____



Over The Air Rekeying (OTAR)

7.7.84 Radio Inhibit

1. DESCRIPTION

A Key Management Facility (KMF) operator can select any radio and completely disable the voice communications and user ergonomics using the Inhibit command. The enable command reverses these states.

Note: The devices under test must have a valid air address registered with the KMF and must be accessible on the data system.

Note: Zeroizing an inhibited radio will deem it unusable and the radio will only be usable again if sent to a Motorola Solutions depot for service. The KMF will display a warning if an attempt is made to zeroize an inhibited radio.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 1

Note: The radio must be current in the KMF

VERSION #1.030

2. TEST

- Step 1. Verify communications between RADIO-1 and RADIO-2.
- Step 2. From the KMF Client window, select the Security menu and then the Radios menu item.
- Step 3. Select RADIO-1 from the list.
- Step 4. Click the 'Inhibit' button, or right-click and choose 'Inhibit.'
- Step 5. From the Event Viewer in the KMF Client window, verify that RADIO-1 is shown under Operation Type. The operation is complete when the Operation Status is Complete and the Operation Progress is 100%.
- Step 6. Verify that RADIO-1 is turned off and cannot communicate with RADIO-2.

Pass____ Fail____



Over The Air Rekeying (OTAR)

7.7.85 Radio Reports

1. DESCRIPTION

The KMF gives the capability to generate two types of reports of radio records; the Detailed View Report and the Summarized Report. The Detailed View Report contains information on the radio's Radio Group, Current Status, and Serial Number. It also displays if it is currently zeroized, inhibited, locked out, or if there are any pending actions. It also shows if KLK is enabled, if Enhanced Security Mode is enabled, if it is a non-Motorola P25 radio and if it is inhibit capable. Finally, it shows the details including the assigned and actual values of the radio's: RSI, Algorithms, UKEKs, Keysets, CKR and TEKS.

A Summary Report is also available that contains a summary of multiple radios including their current status.

SETUP

RADIO-1, RADIO-2, RADIO-3, and RADIO-4 must be entered in the KMF database.

VERSION #1.020

2. TEST

- Step 1. From the KMF Client window, select the Security menu and then the Radios menu item.
- Step 2. Select RADIO-1 from the list.
- Step 3. Right-click and choose 'View Detail Report'. This will display a detailed report of the selected radio.
- Step 4. Review the Detailed Report.
- Step 5. Close the Detailed Report.
- Step 6. Select RADIO-1, RADIO-2, RADIO-3, and RADIO-4 from the list.
- Step 7. Right-click and choose 'View Summary Report'. This will display a summary of the Radio information including their current or non-current state.
- Step 8. Review the Summarized Report.
- Step 9. Close the Summarized Report.

Pass____ Fail____



Over The Air Rekeying (OTAR)

7.7.86 Rekey Request

1. DESCRIPTION

A subscriber unit has the capability to request a rekey from the KMF. If the subscriber has lost or manually removed their TEKs, or has possibly missed an update or keyset changeover, they may need to manually initiate a rekey.

If all of the radio's keys are manually zeroized from the menu screen, the UKEKs will be lost, however the Key Loss Key (KLK) will still decrypt inbound OTAR messages. The radios need to have this Key Loss Key feature turned on in the radio and in their KMF record. The rekey request will not work if the radio is zeroized from the OTAR or if it zeroized by depressing its purple and orange buttons. In this situation, the radio would need to be Red or Auto store and forwarded.

Note: The devices under test must have a valid air address registered with the KMF and must be accessible on the data system.

SETUP

RADIO-1 and its associated KMF record needs to be configured to support Rekey Request functionality.

Either use a KVL or the radio's keypad to delete the TEKs out of RADIO-1.

VERSION #1.030

2. TEST

- Step 1. Initiate a Rekey Request from RADIO-1.
- Step 2. Verify if the subscriber has a display it momentarily displays 'PLEASE WAIT' while the operation is in progress.
- Step 3. Verify, if the subscriber has a display, it displays 'REKEYED' when the operation is complete.
- Step 4. From the Event Viewer in the KMF Client window, verify that Radio 1 is shown under Operation Type. The operation is complete when the Operation Status is Complete and the Operation Progress is 100%.

Pass_____ Fail_____



Over The Air Rekeying (OTAR)

7.7.87 Subscriber Zeroize

1. DESCRIPTION

The Key Management Facility (KMF) can select any radio and permanently erase all encryption keys using the Zeroize command. This command is not reversible without a physical connection between the subscriber and a KVL. A KMF Operator can send this message to a radio that needs to be excluded from all secured communications. When the radio receives this message, all encryption keys (TEKs, UKEKs, KLK) are deleted from the radio, and it is permanently disabled in the KMF database. The KMF will not perform any more key management services to this radio until it is re-initialized.

Note: The devices under test must have a valid air address registered with the KMF and must be accessible on the data system.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 1

Both radios should initially have Keys.

Note: When a radio is zeroized, the radio record in the KMF is permanently flagged to zeroize. If this field is not unchecked, the radio will continue zeroizing every time it is fully updated.

VERSION #1.040

2. TEST

- Step 1. Verify secure communications between RADIO-1 and RADIO-2.
- Step 2. From the KMF Client window, select the Security menu and then the Radios menu item.
- Step 3. Select RADIO-1 from the list and click the 'Zeroize' button, or right-click and choose 'Zeroize'.
- Step 4. From the Event Viewer in the KMF Client window, verify the Operation Status is Complete and the Operation Progress is 100% for the task on RADIO-1.
- Step 5. RADIO-1 no longer has any keys. The radio will display "Key Fail" if set to secure mode.
- Step 6. Initiate a talkgroup call from RADIO-2. Verify that RADIO-1 does not unsquelch since it does not have any keys to decrypt audio.
- Step 7. Connect a KVL to RADIO-1 and verify the radio has no TEKs and no KEKs.
- Step 8. Attempt to perform a Full Update from the KMF to RADIO-1. From the Event Viewer in the KMF Client window, verify that the operation is complete with 1 failure for RADIO-1. This shows that the TEKs and UKEKs were deleted from RADIO-1 since a UKEK is required to perform a Full Update.
- Step 9. In order to re-initialize the radio in the KMF database, first uncheck the zeroized flag in the radio record, then perform a Red or Auto store and forward from the KVL to the KMF server then to the radio and back to KMF server.
- Step 10. Verify secure communications between RADIO-1 and RADIO-2.

Pass____ Fail____



Over The Air Rekeying (OTAR)

7.7.88 Warm Start

1. DESCRIPTION

The Warm-Start procedure is initiated by the Key Management Facility (KMF) when there is a need to communicate securely with a radio but the radio does not have any Traffic Encryption Keys (TEKs) in common with the KMF. This scenario can be encountered if the user manually removed his TEKs via the menu erase function, or if the TEKs are out of date. If the radio is manually zeroized, it is possible the UKEKs will be lost if the user accidentally erases all keys in the radio. This procedure will send a TEK to the radio that is in common with one in the KMF so they can communicate securely. Once a secure communications session is established, the KMF will rekey the radio. This procedure requires the KMF and the radio to share a common UKEK.

Note: The devices under test must have a valid air address registered with the KMF and must be accessible on the data system.

SETUP

RADIO-1 is current with the KMF.

Either use a KVL or the radio's keypad to delete the TEKs out of RADIO-1

VERSION #1.030

2. TEST

- Step 1. From the KMF Client window, select the Security menu and then the Radios menu item.
- Step 2. Select RADIO-1 from the list.
- Step 3. Click the 'Full Update' button, or right-click and choose 'Full Update'.
- Step 4. In the KMF event viewer, right-click on RADIO-1 and select 'View Details'. In the details screen, verify that a warm-start was sent from the KMF to RADIO-1.
- Step 5. Verify that the Full Update is then completed in the KMF event viewer.

Pass____ Fail____



Over The Air Rekeying (OTAR)

7.7.89 KMF Summary Report

1. DESCRIPTION

The KMF gives the capability to generate two types of reports of subscriber records; the Detailed View Report and the Summarized Report.

A Summary Report is also available that contains a summary of multiple devices such as MCC 7500 consoles including their current status.

SETUP

Radios and MCC 7500 console must be entered in the KMF database.

VERSION #1.010

2. TEST

- Step 1. From the KMF Client window, select the Security menu followed by the Radios menu option.
- Step 2. Select a radio from the list.
- Step 3. Right-click and choose 'View Detailed Report.' This will display a detailed report of the selected radio.
- Step 4. Review and verify the data in the Detailed Report.
- Step 5. Close the Detailed Report.
- Step 6. From the KMF Client window, select the Security menu followed by Infrastructure and then Consoles/CDEMs/TMGs.
- Step 7. Right-click and choose 'View Summary Report.' This will display a summary of the MCC 7500 information including its current or non-current state.
- Step 8. Review and verify the data in the Summarized Report.
- Step 9. Close the Summarized Report.

Pass____ Fail____



SYSTEM MANAGEMENT TESTS FATP AND SATP

7.7.90 Affiliation Display (Single Site)

1. DESCRIPTION

Affiliation Display is a Private Radio Network Management (PRNM) application that monitors the mobility of radios for a particular zone. Mobility describes how radio users travel between different sites in a zone and how they communicate with other members of their assigned talkgroup or even with members outside of their talkgroup. A radio can be viewed in more than one zone. As a radio roams from one site to another or changes talkgroups, Affiliation Display updates and displays the affiliation and de-affiliation information for a monitored radio. This information can be useful for the troubleshooting and tracking of radios in the system and for monitoring the movement of traffic within a zone.

The Affiliation Display is divided into three sections: Site Viewer, Talkgroup Viewer, and Radio Viewer.

- The Site Viewer displays the number of talkgroups and number of radios affiliated to that site.
- The Talkgroup Viewer displays how many radios are affiliated to that talkgroup and the number of sites at which the talkgroup has radios affiliated.
- The Radio Viewer window displays affiliation information for a custom list of radios.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 1
RADIO-2 - SITE - SITE 1
RADIO-3 - TALKGROUP 2
RADIO-3 - SITE - SITE 1
RADIO-4 - TALKGROUP 2
RADIO-4 - SITE - SITE 1

VERSION #1.010

2. TEST

- Step 1. Add RADIO-1,RADIO-2,RADIO-3, and RADIO-4 to the Affiliation Display.
- Step 2. Verify that RADIO-1 and RADIO-2 show they are affiliated to SITE 1 and TALKGROUP 1.
- Step 3. Verify that RADIO-3 and RADIO-4 show they are affiliated to SITE 1 and TALKGROUP 2.
- Step 4. Change the talkgroup of RADIO-1 and RADIO-2 to TALKGROUP 2.
- Step 5. Verify that RADIO-1 and RADIO-2's affiliated talkgroup changes to TALKGROUP 2 on the Affiliation Display.

Pass____ Fail____



System Management Tests

7.7.91 Configuration Management - Talkgroup Capabilities

1. DESCRIPTION

The Provision Manager (PM) controls the parameters for all radio users and dispatchers on the system.

Within the Subscriber section, the Talkgroup Configuration Window enables the network manager to tailor SmartZone Talkgroup Capabilities. Emergency, Secure and Priority Monitor are some of the features that can be enabled or disabled. The features that could be unique to the particular user are configured directly in the Talkgroup Configuration Window. The features that could be configured the same for a group of users are placed into records called profiles. The network manager references the profile which contains the desired setup for these features from the Talkgroup Configuration Window.

NOTE: A profile must already exist to be referenced through the Talkgroup Configuration Window but can be modified later if needed.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 1
RADIO-2 - SITE - SITE 2

* Set the "Talkgroup Enabled" flag to YES for TALKGROUP 1 in the PM.

VERSION #1.030

2. TEST

- Step 1. Initiate a call from RADIO-1 on TALKGROUP 1. Verify that RADIO-2 hears the RADIO-1 audio.
- Step 2. Change the Talkgroup Enabled flag to NO for TALKGROUP 1 via the PM.
- Step 3. Initiate a call from RADIO-1 or RADIO-2 on TALKGROUP 1. Verify that neither radio can initiate a call because of the change in status of the Group Enabled Flag of TALKGROUP 1.
- Step 4. Initiate an Emergency call from RADIO-1. Verify that both the console (if present) and RADIO-2 can hear the transmission.
- Step 5. Dekey RADIO-1.
- Step 6. Change the Talkgroup Enabled flag back to YES for TALKGROUP 1 via the PM.
- Step 7. Initiate a call from RADIO-1 on TALKGROUP 1. Verify that both the console (if present) and RADIO-2 hear RADIO-1.

Pass____ Fail____



System Management Tests

7.7.92 Current Status and Diagnostics for MCC 7100/7500 Console

1. DESCRIPTION

This test will demonstrate that the Unified Event Manager (UEM) can change the state of sites and the site status will show in the UEM. To accomplish this, the current state of a Console site will be displayed and using the UEM - "Issue Command" feature, it will be changed.

SETUP

Select the Physical Sites object in the UEM tree for the site to be tested.

VERSION #1.010

2. TEST

- Step 1. In the Unified Event Manager (UEM) Physical Detail View screen, verify the Console Site is green (No alarms).
- Step 2. Through the UEM, open the devices under the site container by right clicking and selecting "View Devices".
- Step 3. Choose the Console position to disable by highlighting the correct device, right clicking and selecting "Issue Command".
- Step 4. Disable the Application Platform or VPM-Dispatch Application (depending on the console type) for the Console from the window and select "Apply".
- Step 5. Observe that the UEM shows that the Application Platform or VPM-Dispatch Application is now Disabled and is User Requested. Verify that the Console Site container shows WARNING.
- Step 6. Choose the Console position and enable by highlighting the correct device, right clicking and selecting "Issue Command".
- Step 7. Enable the Application Platform or VPM-Dispatch Application for the Console from the window and select "Apply".
- Step 8. Observe that the UEM shows that the Application Platform or VPM-Dispatch Application is now Enabled and is User Requested. Verify that the Console Site container returns to a green status.
- Step 9. Close the open windows.

Pass____ Fail____



System Management Tests

7.7.93 Site Wide Area Trunking to Site Trunking State using the Unified Event Manager

1. DESCRIPTION

Through the Unified Event Manager (UEM), the system user can run diagnostics that change the "Trunking State" of a site. The effect of the diagnostic is displayed on the UEM.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1 (Site Locked)
RADIO-2 - TALKGROUP 1
RADIO-2 - SITE - SITE 2
RADIO-3 - TALKGROUP 1
RADIO-3 - SITE - SITE 1 (Site Locked)

NMclient01 - UEM session up and running in the alarms view.

VERSION #1.030

2. TEST

- Step 1. Initiate a Wide Area Call with RADIO-1 in TALKGROUP 1. Verify RADIO-2 and RADIO-3 will be able to monitor and respond to the call.
- Step 2. Select SITE 1 in the Network Database > Sites option in the tree view. Right click and select "Issue Command". Select "Site Trunking" and apply to put the site in Site Trunking mode.
- Step 3. Observe that the UEM alarms view shows that the site is now in Site Trunking and is User Requested.
- Step 4. Verify ZoneWatch (if applicable) no longer shows the SITE 1 trunking activity. Also verify that RADIO-1 can no longer communicate with RADIO-2 but can still communicate with RADIO-3.
- Step 5. Place the site back into Wide Area Trunking using the "Issue command" feature from UEM. Verify that the site returns to Wide Area mode using the UEM.
- Step 6. Verify communications between RADIO-1, RADIO-2 and RADIO-3.

Pass____ Fail____



System Management Tests

7.7.94 Unified Event Manager - Diagnostics - ASTRO Repeater Site

1. DESCRIPTION

The purpose of this test is to demonstrate diagnostic commands can be sent to a Radio Frequency (RF) site and the proper status is reported at the Unified Event Manager (UEM).

All commands are initiated from the UEM.

Standalone and MultiSite configurations are tested.

SETUP

NMclient01 - UEM session up and running in the Network Database view.

VERSION #1.030

2. TEST

- Step 1. From the UEM, right click on an ASTRO Repeater Site managed resource and select the Command option.
- Step 2. The command window opens for the ASTRO repeater Site managed resource with the following commands available: Site Trunking, Site Off, Wide Trunking, and Site Failsoft.
- Step 3. Select Site Trunking and click the Apply button.
- Step 4. The command execution status is displayed in the command window. After the command is executed, the site enters site trunking mode. The event is displayed in the Network Events Browser. An alarm is displayed in the Alarms Browser.
- Step 5. Select Site Off and click the Apply button.
- Step 6. The command execution status is displayed in the command window. After the command is executed, the site enters site off mode. The event is displayed in the Network Events Browser. An alarm is displayed in the Alarms Browser.
- Step 7. Select Wide Trunking and click the Apply button.
- Step 8. The command execution status is displayed in the command window. After the command is executed, the site enters wide trunking mode. The event is displayed in the Network Events Browser.

Pass_____ Fail_____



System Management Tests

7.7.95 Unified Event Manager - Diagnostics - Multisite Site

1. DESCRIPTION

The purpose of this test is to demonstrate diagnostic commands can be sent to a Radio Frequency (RF) site and the proper status is reported at the Unified Event Manager (UEM).

All commands are initiated from the UEM.

For this test the MultiSite configurations will be demonstrated.

SETUP

NMclient01 - UEM session up and running in the Network Database view.

VERSION #1.000

2. TEST

- Step 1. From the UEM, right click on a MultiSite Site managed resource and select the Command option.
- Step 2. The command window opens for the Multisite Site managed resource with the following commands available: Site Trunking, Site Off, Wide Trunking, and Site Failsoft.
- Step 3. Select Site Trunking and click the Apply button.
- Step 4. The command execution status is displayed in the command window. After the command is executed, the site enters site trunking mode. The event is displayed in the Network Events Browser. An alarm is displayed in the Alarms Browser.
- Step 5. Select Site Off and click the Apply button.
- Step 6. The command execution status is displayed in the command window. After the command is executed, the site enters site off mode. The event is displayed in the Network Events Browser. An alarm is displayed in the Alarms Browser.
- Step 7. Select Wide Trunking and click the Apply button.
- Step 8. The command execution status is displayed in the command window. After the command is executed, the site enters wide trunking mode. The event is displayed in the Network Events Browser.

Pass_____ Fail_____



System Management Tests

7.7.96 Provisioning Manager – Export Data to .csv File

1. DESCRIPTION

The Provision Manager (PM) allows users to customize and filter the viewable data to show desired data. Through the Filter tile one can limit the viewed data to show specific items, like Radios 1 through 500. Through the Customize tile data can be added and data not desired can be hidden. Also within Customize is the ability to pull in columns from various other sources, like Profiles, Status sets, and more.

Once a Customized and Filtered view is created an Export of this data can be generated. The output of this export is a .csv (Comma- Separated values) file. This file will be saved to the PC generating the export. This file can now be opened with many programs that can view and manipulate data in tables. Excel is one of these programs. Export can be done on any PM data. This test case will focus on an IV&D radio.

SETUP

Enter some radios into the PM database: e.g.

RADIO-1,
RADIO-2,
RADIO-3,
Etc.

VERSION #1.050

2. TEST

- Step 1. Start the PM application from the NM Client.
- Step 2. Select <Subscriber> from the top menu.
- Step 3. Select <IV&D radio> from the Navigation Tree from the left pane.
- Step 4. Verify that radio list is correct.
- Step 5. Select < Current View > under the <Export> from the Action lists on top of the pane.
- Step 6. Select Folder and File Name to be saved as from the Pop Up File Menu using the drop box next to Save button and save the file.
- Step 7. Open the saved file with any application that can view the file: e.g. open the file with Notepad, Wordpad, or use the "Type" command from a DOS window. It's also possible to download the .csv file to a service laptop and view the file w/ Excel.
- Step 8. Verify that the radios are listed as shown in the PM window.

Pass____ Fail____



System Management Tests

7.7.97 Provisioning Manager – Import Data from .csv File

1. DESCRIPTION

The Provisioning Manager (PM) application allows import capability from a .csv (comma separated value) format file.

Import can be done on Radios and Talkgroups (including Foreign Talkgroups): IV&D & HPD Radios for Trunked, Conventional Voice Unit & Conventional Voice and Data Unit for Conventional, and Application to Conventional Unit Maps for the Console, and Talkgroups. However, the import capability is not extended to Multigroup nor Agencygroup.

This import function has three procedures:

1. Create the Template for Import
2. Edit the Template file for Import
3. Import the edited file

This test case will focus on an IV&D radio.

SETUP

No prior setup is required.

VERSION #1.050

2. TEST

- Step 1. Start the PM application from the NM Client, select <Subscriber> from the top menu, then select <IVD radio> from the Navigation Tree from the left pane.
- Step 2. Select <Import> from the top of the pane, then select <Template with records from current view> from the top of the pane.
- Step 3. Select Folder and File Name to be saved as from the Pop Up File Menu using the drop box next to Save button and save the file.
- Step 4. Open the saved file with any application that can edit the file: e.g. open the file with Notepad, Wordpad, or download the file to a service laptop and open w/ Excel.
- Step 5. Edit the file according to the template.
- Step 6. From the PM window, select <Browse>, then select the file that has been edited for import.
- Step 7. Select <Upload> from the PM window.
- Step 8. Verify the imported list.

Pass____ Fail____



System Management Tests

7.7.98 Unified Event Manager - Force Synchronization - Core Router

1. DESCRIPTION

Synchronization is the process where the status of a device is periodically checked. There could be situations where a user may not want to wait for the minimum period to view the synchronization results. Therefore, the user can initiate a synchronization request for the device with the manager called Force Synchronization. Force Synchronization interrupts the normal synchronization process and checks the status of a particular device.

The purpose of this test is to demonstrate the ability to manually synchronize the state with agents within the system using the Unified Event Manager (UEM).

Manual synchronization provides a fallback to obtain object status after a network interruption.

SETUP

NMclient01 - UEM session up and running.

VERSION #1.020

2. TEST

- Step 1. On a UEM client session, click on the Network Database node tree in the navigation window.
- Step 2. Right click on a Core Router, then select Synchronize.
- Step 3. The Synchronization Job Status window appears with the Job Status ID.
- Step 4. Click on the View Job Status button.
- Step 5. The Job Status View window opens providing the Job ID, Status, Owner, Type, Target, Submit Time, End Time, and Additional Info for all the jobs.
- Step 6. Locate the Synchronization job initiated in step 2 and click on the job. Verify the Synchronization job is listed with a status of Success.
- Step 7. Click on the View Log button. A summary of the Synchronization job details is provided in the job log.
- Step 8. Locate the Core Router in the Network Database View. The correct Severity property of the device is displayed.

Pass____ Fail____



System Management Tests

7.7.99 Unified Event Manager - User Actions Create Audit Trails

1. DESCRIPTION

One of the functions of the Unified Event Manager (UEM) that can be managed under Security Management is the User activity log, also called Audit Trails, containing:

Operations invoked by the user.

The name of the user who invoked the operation.

Data and time of invocation.

Target device/object on which the operation was invoked.

The status of the operation.

The category of invoked operation.

This test will demonstrate that Unified Event Manager (UEM) user actions are logged by the system. These audit items log the history of activity for a period of up to 1 year.

Note: The audit log is part of the UEM database. A database restore or reload of the UEM may affect the audit log history.

SETUP

NMclient 01 - UEM client session active.

(Note: If the Authentication Audit Log has been cleared there will only be the event to clear the log.)

VERSION #1.050

2. TEST

- Step 1. On a UEM client session, select Administration from the menu bar and then System Administration. The Administration Menu window opens up.
- Step 2. In the System Administration window, click on Audit Trails.
- Step 3. Verify the Audit Log is displayed. The following information is displayed for each entry: User Name, Operation, Audit Time, Severity, Category, and Audited Object. User actions recorded include: Authentication, Logout, Discovery, Synchronization, Device Deletion, Command, Telnet, and Manage/Unmanage.

Pass____ Fail____



System Management Tests

7.7.100 Unified Event Manager - Conventional Channel GateWay Diagnostics

1. DESCRIPTION

The purpose of this test is to demonstrate diagnostic commands are sent to a Conventional Channel GateWay (CCGW) and the proper status is reported at the Unified Event Manager (UEM).

All commands are initiated from the UEM.

SETUP

RADIO-1 CONVENTIONAL CHANNEL 1
RADIO-2 CONVENTIONAL CHANNEL 1
CONSOLE-1 CONVENTIONAL CHANNEL 1

NMclient01 - UEM session up and running in the Network View.

VERSION #1.010

2. TEST

- Step 1. From the UEM, right click on a CCGW managed resource and select SNMP-Node then the Issue Command option.
- Step 2. The command window opens for the CCGW managed resource with the following commands available: Disable and Enable.
- Step 3. Verify the conventional channel is operational using the two radios programmed to use CONVENTIONAL CHANNEL 1.
- Step 4. Select Disable and click the Apply button.
- Step 5. The command execution status is displayed in the command window. After the command is executed, the CCGW is disabled. The event is displayed in the Network Event Browser. An alarm is displayed in the Alarm Browser.
- Step 6. Attempt to place a conventional call using the two radios. The call audio will not be heard at the console. The resource at Console-1 will show that the resource is unavailable.
- Step 7. In the UEM Command window, select "Up" and click the Apply button.
- Step 8. The command execution status is displayed in the command window. After the command is executed, the CCGW is enabled. The event is displayed in the Network Event Browser.
- Step 9. Attempt to place a conventional call using RADIO-1. The call should now be heard by CONSOLE-1 as well as RADIO-2.

Pass____ Fail____



System Management Tests

7.7.101 Unified Network Configurator Device Management - Site Parameter

1. DESCRIPTION

The Unified Network Configurator (UNC) allows users to perform various functions to managed devices on the system. This test will cover the modification of a parameter at a site.

For this test, the Site Alias parameter will be modified on all radio system devices at the site.

SETUP

If the UNC is not open, double-click the UNC shortcut (UNC) on the desktop, and a VoyenceControl client session will launch. When prompted, use the Login dialog box to login to the UNC using the appropriate username and password. If the UNC Wizard is not open, double-click the UNC Wizard (UNCW) shortcut on the desktop, and a UNC Wizard client session will launch. When prompted, use the Login dialog box to login to the UNC Wizard using the appropriate username and password.

VERSION #1.020

2. TEST

- Step 1. Using the UNC Wizard, select a RF Repeater site or Simulcast Subsite to update. (Note: Changing an entire Simulcast Cell may take a considerable amount of time.)
- Step 2. Change the Site Alias parameter to a new value and click the Submit button.
- Step 3. From the tools menu of the UNC client session, open the Schedule Manager. Configuration remedy jobs are immediately added to the Schedule Manager with a status of Pending for all affected target devices.
- Step 4. Highlight the pending Remedy jobs and approve them in the Schedule Manager. The remedy jobs are approved and indicate a status of running in the Schedule Manager.
- Step 5. Refresh the Schedule Manager view until the jobs are completed.
- Step 6. View the current configuration information for the devices at the site, and verify that the Site Alias has been updated in the devices current configuration.
- Step 7. Return the site alias to the correct value.

Pass____ Fail____



System Management Tests

7.7.102 Virtual Private Network Via Customer Enterprise Network Firewall - No Authentication

1. DESCRIPTION

The Juniper Virtual Private Network (VPN) firewalls provide remote access for service and maintenance technicians (Customer or Motorola) through a VPN Client. Once the VPN client is connected, the VPN firewall allows a service technician to run a remote desktop on an NM Client. The service technician can then work on the entire Master Site by using standard ASTRO® 25 NM tools and any pre-installed service tools.

SETUP

A configured service laptop with the appropriate VPN software is required.

VERSION #1.010

2. TEST

- Step 1. From the service laptop attempt to ping nm client on Motorola radio network. Verify no connection can occur. Open Remote desktop connection and attempt to connect to NM client on Motorola radio network. Confirm no connection.
- Step 2. Right click on vpn program (Netscreen Remote) in system tray.
- Step 3. Select "Connect" -> My connections\NM_Client-No_Auth
- Dialogue box appears "Successfully connected to My Connections\NM_Client-No-Auth."
- Step 4. Attempt to ping nm client again. Verify visibility to nm client.
- Step 5. Open Remote desktop connection (program) on service laptop. Validate connection to NM client.

Pass____ Fail____



System Management Tests

7.7.103 ZoneWatch

1. DESCRIPTION

ZoneWatch is an administration tool for monitoring radio traffic on a system. A system manager can use ZoneWatch to analyze traffic patterns for load distribution and troubleshoot radio and site problems. ZoneWatch is used to view current radio traffic activity for the system. This activity is displayed in graphical format, color-coded for easy identification of the type of activity occurring on the system.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 1
RADIO-2 - SITE - SITE 2
RADIO-3 - TALKGROUP 1
RADIO-3 - SITE - SITE 3
RADIO-4 - TALKGROUP 1
RADIO-4 - SITE - SITE 4

VERSION #1.010

2. TEST

- Step 1. Verify that ZoneWatch has been configured for the Grid and Multi Site Scroll windows to display system activity.
- Step 2. From the PC Application Launcher, select a zone folder.
- Step 3. From within that zone, select ZoneWatch.
- Step 4. Select the appropriate profile to be able to view the channel usage on the system.
- Step 5. Initiate several calls with the radios and observe that the appropriate channel usage information is displayed.

Pass_____ Fail_____



MOSCAD FAULT MANAGEMENT SYSTEM FATP AND SATP

7.7.104 Screen Navigation

1. DESCRIPTION

MOSCAD alarming tests shall be conducted from the MOSCAD server and clients if applicable. The alarms demonstrated are to be made on the actual equipment or punch block interface, with an exception made for cases where it is not practical to create an actual alarm. The following will provide a brief introduction and description of the main display screens encountered when navigating the MOSCAD GUI (Graphic User Interface).

SETUP

No prior setup is required.

VERSION #1.010

2. TEST

- Step 1. Login and Password Screen -
This is the first screen displayed after a system startup. It allows a user with the proper login and password to access the MOSCAD alarm system. Login to MOSCAD using the appropriate user name and password.
- Step 2. System Overview Screen -
The "System Overview" screen contains site names adjacent to color status pushpins. Details of a particular site can be viewed by selecting the site name pushpin of interest. Depending on alarm status, the color bullet will flash
- Step 3. Alarm Summary Screen -
Proceed to the "Alarm Summary" screen from the "System Overview" screen. The "Alarm Summary" screen provides a text display of all alarms currently in the system. On this screen, you can choose between alarm summary and alarm history by selecting the "Alarm Summary / Alarm History" button. Also, the display can be filtered to show alarms based on site name or acknowledgement status.
- Step 4. Comm Screen -
From the "Alarm Summary" screen access the "Site Comm" screen. The "Site Comm" screen displays a combined communication status for each site. To view all the SDM3000s within a site, select the icon next to the site comm. Should the communications path between the IP Gateway and any SDM3000 in the system be interrupted, it will be indicated by an alarm present on this screen.
- Step 5. Device Monitoring
From the "System Overview" screen, navigate to each site monitored by MOSCAD in the system. Once a particular site pushpin has been selected, a site overview screen will appear that indicates the types and quantities of devices monitored by MOSCAD at that site.

Pass____ Fail____



MOSCAD Fault Management System

7.7.105 GCP 8000 MultiSite Controller - Ethernet Communications Failure Detection

1. DESCRIPTION

The MOSCAD system will interface to the GCP 8000 via the network hub or switch. Select alarm messages are then converted to native MOSCAD data format for transmission to the MOSCAD alarm Server.

SETUP

No prior setup is required.

VERSION #1.020

2. TEST

- Step 1. Choose the site to perform test.
- Step 2. Verify that there are no current alarms for the chosen primary or redundant GCP 8000.
- Step 3. Disconnect one of the GCP 8000s from the Ethernet network.
- Step 4. Verify that the graphic user interface indicates that the primary GCP has failed SNMP communications. Note that this failure detection can take up to 10 minutes to be displayed.
- Step 5. Acknowledge the alarm on a MOSCAD server or client.
- Step 6. Re-connect the Ethernet cable previously removed.
- Step 7. Verify the communications alarm clears.

Pass_____ Fail_____



MOSCAD Fault Management System

7.7.106 GCP 8000 MultiSite Controller - Site Failsoft

1. DESCRIPTION

The MOSCAD system will interface to the GCP 8000 via the network switch. Select alarm messages are then converted to native MOSCAD data format for transmission to the MOSCAD alarm Server.

SETUP

No prior setup is required.

VERSION #1.010

2. TEST

- Step 1. Choose the site to perform test.
- Step 2. Verify that there are no current alarms for the chosen GCP 8000 on the MOSCAD server and client(s).
- Step 3. From the UEM select the Simulcast site to be tested, right click the site select View Devices, then select "Issue Command, set the Site to "Site Failsoft"
- Step 4. Verify that a site failsoft alarm is received at the MOSCAD server and clients.
- Step 5. Acknowledge the alarm on either the MOSCAD server or client.
- Step 6. Return the site from failsoft.
- Step 7. Verify that the site controller returns to normal.

Pass____ Fail____



MOSCAD Fault Management System

7.7.107 InTouch Alarm Processing - Acknowledged Alarm

1. DESCRIPTION

This segment of the test verifies that the bi-state site alarms are processed and communicated to the MOSCAD Server. The alarms can originate from a device with "hard wired" physical dry contact interfacing or from a device connected to the MOSCAD SDM3000 by means of an RS232 or Ethernet protocol interface.

This test will also show the equal display and acknowledging capabilities of both MOSCAD Server and Client(s).

SETUP

No prior setup is required.

VERSION #1.010

2. TEST

- Step 1. Create an alarm condition by simulating an alarm on a device in the system or shorting/opening a status input to any MOSCAD status input module in the system. Navigate to the lowest level screen that depicts the highest degree of alarm detail.
- Step 2. Verify that the colored status bullet for the associated alarm on the server is blinking red and for RS232 interfaces, that the "state" text is red and is displayed for the correct alarm point and site.
- Step 3. If speakers are present, verify that an audible indication is heard at the client.
- Step 4. Verify that the alarm displays in red text on the pop-up Alarm Summary window.
- Step 5. Click with the mouse on the "acknowledge" button. Verify that the audible indication is silenced.
- Step 6. Verify that the text on the alarm summary window of the server changes from red (unacknowledged alarm) to black (acknowledged alarm).
- Step 7. Verify that the colored status bullet for the associated alarm on the server remains red but stops blinking.
- Step 8. Return the alarm point to the normal condition. Verify that the colored status bullet for the associated alarm returns to green.
- Step 9. Verify that the text is removed from the alarm summary window.
- Step 10. These steps should be performed once again to verify the functionality of the MOSCAD client(s).

Pass____ Fail____



MOSCAD Fault Management System

7.7.108 InTouch Alarm Processing - Unacknowledged Alarm

1. DESCRIPTION

This segment of the test verifies that the bi-state site alarms are processed and communicated to the MOSCAD Server. The alarms can originate from a device with "hard wired" physical dry contact interfacing or from a device connected to the MOSCAD SDM3000 by means of an RS232 or Ethernet protocol interface.

This test will also show the equal display and acknowledging capabilities of both MOSCAD Server and Client(s).

SETUP

No prior setup is required.

VERSION #1.010

2. TEST

- Step 1. Create an alarm condition by simulating an alarm on a device in the system or shorting/opening a status input to any MOSCAD status input module in the system. Navigate to the lowest level screen that depicts the highest degree of alarm detail.
- Step 2. Verify that the colored status bullet for the associated alarm on the server is blinking red and for RS232 interfaces, that the "state" text is red and is displayed for the correct alarm point and site.
- Step 3. If speakers are present, verify that an audible indication is heard at the Server.
- Step 4. Without acknowledging the alarm, return the alarm point to its normal condition.
- Step 5. Verify the text on the alarm summary window of the server has changed from red to blue indicating the alarm that has returned to normal but remains unacknowledged.
- Step 6. Verify that the associated alarm bullet is blinking green and yellow, indicating an unacknowledged alarm that has returned to normal. An audible alert will persist until the alarm is acknowledged.
- Step 7. These steps should be performed once again to verify the functionality of the MOSCAD client(s).

Pass____ Fail____



MOSCAD Fault Management System

7.7.109 Physical Inputs/Outputs - Analog Inputs

1. DESCRIPTION

The purpose of this section is to verify that the physical inputs and outputs that interface to the MOSCAD I/O modules are properly processed by the MOSCAD system. Analog inputs can be tested by comparing GUI needle deflection on-screen (full scale, half scale, 2/3 scale, etc)

Analog values can only be seen on the MOSCAD alarm server and clients.

SETUP

Setup Description

VERSION #1.010

2. TEST

- Step 1. Choose the site to perform the test.
- Step 2. At the MOSCAD server or client, select the Analog Input icon from the testing site overview screen.
- Step 3. Using a MOSCAD test board, manipulate the analog input voltage by moving the potentiometer to $\frac{1}{4}$, $\frac{1}{2}$, or $\frac{3}{4}$ of the full range.
- Step 4. Verify that the needle deflection of the MOSCAD alarm manager matches, with reasonable accuracy, to that of the potentiometer.

Pass____ Fail____



MOSCAD Fault Management System

7.7.110 Physical Inputs/Outputs - Digital Inputs

1. DESCRIPTION

The purpose of this section is to verify that the physical inputs and outputs that interface to the MOSCAD I/O module(s) are properly processed by the MOSCAD system. All alarms demonstrated are to be made on the punch block. Proper processing can be verified by observing I/O module LED indications for DI's.

DI - Digital Inputs
UEM - Unified Event Manager

SETUP

NMclient01 - UEM session up and running.

VERSION #1.010

2. TEST

- Step 1. Select a site at to perform the test.
- Step 2. Short/Open the input point and verify that an alarm indication is received at the InTouch Server and/or client(s).
- Step 3. Verify the active alarm is displayed in the UEM. (Make sure the show all button has been selected.)
- Step 4. Return the input to its normal condition. Verify that the alarm indication changes in the UEM active alarms view.

Pass_____ Fail_____



MOSCAD Fault Management System

7.7.111 Report Generator

1. DESCRIPTION

The Report Generator is used as a stand-alone or a networked application to log and report alarms that are generated within the Wonderware Intouch database. Alarms and Acknowledgements can be logged and stored according to the time, site, or equipment at which the alarm originated, and the detailed summary of filtered events can then be forwarded to a printer. Report Generator is capable of Auto Archiving on a monthly basis or at every 150,000 events, whichever occurs first, and it includes utilities to both compact and repair the alarm database.

SETUP

No prior setup is required.

VERSION #1.010

2. TEST

- Step 1. Minimize the Wonderware Intouch software and select the Report Generator icon from the Windows desktop.
- Step 2. Select the "Show Report" button shown in the application.
- Step 3. Verify that the present date is displayed as well as any past alarms for which the Report Generator is configured.
- Step 4. Create several alarm conditions (typically 2 or 3) by simulating alarms on devices in the system or by shorting/opening a status input to any MOSCAD status input module in the system.
- Step 5. Verify that the alarms are displayed on the Wonderware Intouch alarm summary screen.
- Step 6. Verify that the alarms are displayed on the Report Generator alarm history report.

Pass____ Fail____



MOSCAD Fault Management System

7.7.112 RSBR(Repeater Site Base Radio) / MSBR(Multisite Base Radio) Diagnostics - Reset Station

1. DESCRIPTION

The MOSCAD system will connect to each repeater site base radio (RSBR) or a multisite base radio (MSBR) using the site's Ethernet switch(es). The MOSCAD will receive SNMP traps from the base radio (BR) as well as solicit the BR for status. The MOSCAD will continuously poll for any alarm messages present in the BR. New alarm messages, with respect to the last received status held in the SDM3000, are then converted to native MOSCAD data format for transmission to the MOSCAD alarm Server.

SETUP

No prior setup is required.

VERSION #1.010

2. TEST

- Step 1. From the MOSCAD client, choose the channel and site to perform the test.
- Step 2. Verify that there are no current alarms for the chosen base radio on the MOSCAD server and/or client(s).
- Step 3. Select "Station Reset".
- Step 4. Verify that the station is reset by observing the LED's on the face of the respective base radio.
- Step 5. Verify that the applicable alarms report to MOSCAD for the station reset.

Pass_____ Fail_____



MOSCAD Fault Management System

7.7.113 TRAK Communication Status Fault (UEM)

1. DESCRIPTION

The MOSCAD system connects to a TRAK 9100 GPS Standard via the RS-232 port 9 pin D connector. This interface requires a dedicated MOSCAD SDM3000 RS-232 port. The MOSCAD will periodically solicit the TRAK for its status and response messages are sent back to the MOSCAD SDM3000. New alarm messages, with respect to the last received status held in the SDM3000, are then converted to native MOSCAD data format for transmission to the MOSCAD alarm Server. Alarm messages are also sent as SNMP traps from the SDM3000's IP Interface to the Unified Event Manager (UEM).

SETUP

No Setup Required.

VERSION #1.010

2. TEST

- Step 1. Choose the site to perform the test.
- Step 2. Verify there are no current alarms for the chosen TRAK GPS on the InTouch and in the Unified Event Manager (UEM)
- Step 3. Disconnect the RJ45 communication cable (which ultimately connects to the TRAK 9100 RS232 port) from the rear of the GPS.
- Step 4. Verify that the TRAK 9100 communication alarm is received at the MOSCAD server and at the UEM alarm manager. (This may take up to 5 minutes)
- Step 5. Acknowledge the alarm on either the MOSCAD server or client.
- Step 6. Reconnect the communication cable to the TRAK 9100 GPS.
- Step 7. Verify that the GPS communication status returns to normal on the alarm managers.

Pass_____ Fail_____



MOSCAD Fault Management System

7.7.114 TRAK GPS - GPS Fault

1. DESCRIPTION

The MOSCAD system connects to a TRAK 9100 GPS Standard via the RS-232 port 9 pin D connector. This interface requires a dedicated MOSCAD RS-232 port. The MOSCAD will periodically solicit the TRAK for its status and response messages are sent back to the MOSCAD SDM3000. New alarm messages, with respect to the last received status held in the SDM3000, are then converted to native MOSCAD data format for transmission to the MOSCAD Server. Alarm messages are also sent as SNMP traps from the SDM3000's IP Interface to the Unified Event Manager (UEM) application.

SETUP

NMclient01 - UEM session up and running.

VERSION #1.010

2. TEST

- Step 1. Choose the site to perform the test.
- Step 2. Verify there are no current alarms for the chosen TRAK GPS on the MOSCAD server and UEM active alarms view.
- Step 3. Disconnect the antenna cable from the TRAK GPS.
- Step 4. Verify that the alarm is received at the MOSCAD server and/or client.
- Step 5. Acknowledge the alarm on either the MOSCAD server or client.
- Step 6. Reconnect the antenna cable to the TRAK GPS standard.
- Step 7. Verify that the TRAK GPS status returns to normal.

Pass____ **Fail**____



MOSCAD Fault Management System

7.7.115 TeNSr Channel Bank - Power Supply Fail

1. DESCRIPTION

The MOSCAD system will connect to each TeNSr channel bank's computer port 9 pin D connector. This port is found in the rear of the channel bank on the INF (Interface) module. TeNSr monitoring requires a dedicated MOSCAD SDM3000 RS-232 port. The MOSCAD receives alarms from the channel bank but cannot solicit status from the channel bank. New alarm messages, with respect to the last received status held in the SDM3000, are then converted to native MOSCAD data format for transmission to the MOSCAD alarm Server. Alarm messages are also sent as SNMP traps from the SDM3000's IP Interface to the Unified Event Manager (UEM) application. The channel bank can have up to 28 modular circuits monitored, though in most cases it will be a subset of this maximum

Note that this test requires the channel bank to be configured with dual power supplies. This test may not be run on a single power supply channel bank.

SETUP

NMclient01 - UEM session up and running.

VERSION #1.020

2. TEST

- Step 1. Choose the TeNSr channel bank with dual power supplies to perform test.
- Step 2. Verify that there are no current alarms for the chosen channel bank on the MOSCAD and Unified Event Manger (UEM) active alarms view.
- Step 3. Remove one of the power supplies and verify it is no longer powered.
- Step 4. Verify that the alarm is received on the MOSCAD system and alarms are also received in the active alarms view of UEM.
- Step 5. Acknowledge the alarm on either the MOSCAD server or the MOSCAD client.
- Step 6. Reinsert the power supply.
- Step 7. Verify that the TeNSr status returns to normal.

Pass____ Fail____



MOSCAD Fault Management System

7.7.116 Unified Event Manager - MOSCAD Management

1. DESCRIPTION

MOSCAD SDM3000s report alarms to the Unified Event Manager (UEM) via SNMP traps. The purpose of this test is to demonstrate that all MOSCAD site objects are being managed effectively from UEM.

SETUP

NMClient01 - UEM client session running

VERSION #1.010

2. TEST

- Step 1. Navigate through the UEM application to view a site with the MOSCAD SDM3000.
- Step 2. Verify all MOSCAD devices for the specific site have been discovered and indicative of any failures that they have in the active alarms view.

Pass_____ Fail_____

REPORT GENERATION TESTS FATP AND SATP

7.7.117 Historical Reports

1. DESCRIPTION

Performance reports can be created automatically for dynamic statistical information about the air traffic activity on the system. These reports provide assistance with system management, resource planning, usage allocation, and monitoring. All reports are preformatted and summarize air traffic activity for a configured time span.

Note: Depending on the time span selected smaller time intervals may not be available.

SETUP

No prior setup is required for this test.

VERSION #1.010

2. TEST

- Step 1. From the PC Application Launcher, select a zone.
- Step 2. From that zone's menu, choose Zone Historical Reports.
- Step 3. From the Historical Reports Player window that opens, select a report.
- Step 4. Using the left mouse button, click on the view button.
- Step 5. Observe a window opens allowing a user to enter report parameters.
- Step 6. Enter all desired data for the report and Generate Report.
- Step 7. Observe a window appears showing the requested report.
- Step 8. Close the report window.
- Step 9. Run the following reports during testing: Talkgroup at Zone Summary; User at Zone Summary; Site Summary.

Pass____ Fail____

SYSTEM RELIABILITY FEATURES FATP AND SATP

7.7.118 Multiple Control Channels

1. DESCRIPTION

A maximum of four channels are eligible for assignment as control channel at each site. In the event that the assigned control channel fails at any remote site, the Zone Controller automatically selects one of the other control capable channels as the active control channel for that site. A Control Channel Preference Level can be used to rank the control capable channels where 1 is the highest ranking and 4 the lowest.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 1
RADIO-2 - SITE - SITE 1
RADIO-3 - TALKGROUP 2
RADIO-3 - SITE - SITE 1
RADIO-4 - TALKGROUP 2
RADIO-4 - SITE - SITE 1

VERSION #1.020

2. TEST

- Step 1. Initiate a Talkgroup Call with RADIO-1 on TALKGROUP 1.
- Step 2. Observe that only RADIO-2 will be able to monitor and respond to the call.
- Step 3. Initiate a Talkgroup Call with RADIO-3 on TALKGROUP 2.
- Step 4. Observe that only RADIO-4 will be able to monitor and respond to the call.
- Step 5. Power off the control channel at SITE 1.
- Step 6. Observe that the control channel rotates to the next available channel capable of acting as a control channel.
- Step 7. Initiate a Talkgroup Call with RADIO-1 on TALKGROUP 1.
- Step 8. Observe that only RADIO-2 will be able to monitor and respond to the call.
- Step 9. Initiate a Talkgroup Call with RADIO-3 on TALKGROUP 2.
- Step 10. Observe that only RADIO-4 will be able to monitor and respond to the call. Power up the channel previously powered off to return the system to normal operation.

Pass_____ Fail_____



System Reliability Features

7.7.119 Receiver Interference Shutdown

1. DESCRIPTION

Receiver interference occurs when a repeater receives an unauthorized signal. In order to prevent a disruption of communications, the affected channel will be disabled and removed from the system's pool of available channel resources when the undesired carrier is detected for longer than the time-out period. Once the interfering carrier disappears, the channel is returned to service within approximately 5 minutes. The channel is then enabled.

Note: The default Carrier Malfunction Timeout is 50 seconds. If the default value is to be modified, the change will need to be made in the Unified Network Configurator (UNC) for the channel(s) to be modified.

SETUP

A Service Monitor or configured subscriber is needed to transmit a signal at the receive frequency of a chosen channel.

VERSION #1.010

2. TEST

- Step 1. Using a service monitor, transmit a 1 kHz tone at the receive frequency of any repeater.
- Step 2. Continue to transmit the 1 kHz tone until the controller removes the channel from service. (The Carrier Malfunction Time parameter timer is configurable, default is 50 seconds).
- Step 3. Initiate a Talkgroup Call with RADIO-1 on TALKGROUP 1.
- Step 4. Dekey (allow the channel to end the call) and initiate another Talkgroup Call with RADIO-1. Verify the affected channel is removed from the selection/assignment process by repeating talkgroup calls until the available channels have all been used.
- Step 5. From the Unified Event Manager (UEM), verify channel malfunction due to interfering carrier is indicated.
- Step 6. Remove the interfering signal. Verify the test Channel is returned to service within five minutes and that UEM indicates that the channel is now enabled.
- Step 7. Initiate a Talkgroup Call with RADIO-1 on TALKGROUP 1. Dekey (allow the channel to end the call) and initiate another Talkgroup Call with RADIO-1. Repeat the calls until the test channel has been used.
- Step 8. Verify that RADIO-2 can monitor and respond to the TALKGROUP 1 call on the channel that has returned to service.

Pass_____ Fail_____



System Reliability Features

7.7.120 Transmitter Power Failure Shutdown

1. DESCRIPTION

The repeaters can detect a loss or decrease in transmitter output power of all trunked repeaters connected to it. Each trunked repeater contains an internal wattmeter element. Once the forward power has decreased past the threshold set, the repeater instructs the Zone Controller to take the channel out of service. If reflected power increases past the threshold set, the repeater will also instruct the Zone Controller to take the channel out of service. Once the station threshold has been exceeded and the station taken out of service a 5 minute timer will start. At the timer expiration a transmitter test will start to perform a self check on the station. This self check lasts for 20 seconds. If the station passes the self check it will be placed back into service.

Note: This test should be done on a site with more than 2 channels. Failsoft will occur if the test is done on a 2 channel site.

SETUP

RADIO-1 - TALKGROUP 1

VERSION #1.010

2. TEST

- Step 1. Select a channel to disconnect the transmit antenna connection to the trunked repeater. (This will cause a high VSWR condition)
- Step 2. Key RADIO-1 so that the selected channel is assigned, and verify that the channel disables due to an alarm condition. Verify that this alarm is reported at the Unified Event Manager (UEM).
- Step 3. Wait 30 seconds after the failure then restore the transmit antenna connection to the trunked repeater.
- Step 4. Using the station LEDs, verify that the time it takes from the corrected connection to the station being placed back in service is within 5 minutes.
- Step 5. Verify the Unified Event Manager (UEM) also reports the station being back in service.

Pass____ Fail____



System Reliability Features

7.7.121 Redundant Console Site Link Failure

1. DESCRIPTION

Communication between the Master Site and a Remote Console Site can take place over dedicated redundant links. The two links between the Master Site and the Remote Console Site operate in a redundant mode. The system will switch to the backup link if the main LAN or WAN link fails.

Note: The Primary Site Router, if functional, will always be the active router. The Secondary Site Router will only take over when the Primary Site Router is malfunctioning.

SETUP

RADIO-1 - TALKGROUP 1

RADIO-1 - SITE - SITE 1

CONSOLE-1 - TALKGROUP 1

A radio and a Console are required to perform this test (RADIO-1 and CONSOLE-1). Select a Console site with redundant links to the Master Site.

VERSION #1.010

2. TEST

- Step 1. CONSOLE-1 initiates a Talkgroup call on TALKGROUP 1.
- Step 2. Observe that RADIO-1 is able to receive and respond to the call.
- Step 3. Remove the WAN link from the active router (Primary Site Router) at the Remote Console Site.
- Step 4. Initiate a Talkgroup Call with RADIO-1 in TALKGROUP 1.
- Step 5. Observe that CONSOLE-1 is able to receive and respond to the call.
- Step 6. Replace the WAN link connection that was removed in step 4.

Pass____ Fail____



System Reliability Features

7.7.122 Continued Operation Upon Loss of Reference Distribution Module

1. DESCRIPTION

Dual LAN subsites are equipped with new hardware that enable all of the Multisite Base Radios (MsBRs) to communicate over an active or redundant LAN, thus lessening the impacts of a single point of failure. Two modules ("GPB 8000 Reference Distribution Modules (RDM)") are added to the primary GTR8000 Expandable Site Subsystem (ESS) to facilitate the switching and time reference distribution functions at the remote sites. In addition, the expansion cabinets are equipped with two Expansion HUBs (XHUBs). A failure of an RDM or XHUB will result in the MsBRs automatically reverting to the LAN served by the other active RDM/XHUB thus allowing continued wide area operation by all MsBRs.

This test case will demonstrate continued wide area operation upon a single point of failure associated with an RDM failure.

SETUP

RADIO-1 TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 TALKGROUP 1
RADIO-2 - SITE - SITE 2
RADIO-3 TALKGROUP 1
RADIO-3 - SITE - SITE 1

Ensure ZoneWatch is setup to monitor the sites and the Unified Event Manager (UEM) is available for viewing faults.

Note: An RDM/XHUB failure can be simulated by pulling the RDM/XHUB out of the ESS.

VERSION #1.020

Use or disclosure of this proposal is subject
PALM BEACH COUNTY RADIO SYSTEM to the restrictions on the cover page.

2. TEST

- Step 1. Using RADIO-1, key-up on a channel residing on SITE 1's primary Expandable Site Subsystem (ESS). While RADIO-1 is keyed, fail RDM 1.
- Step 2. Verify RADIO-1 operation on ZoneWatch. RADIO-1 stays on the same channel and the Site remains in wide area trunking.
- Step 3. Verify that RADIO-2 and RADIO-3 receive RADIO-1 audio.
- Step 4. Verify that the UEM reports the failure of RDM 1.
- Step 5. Dekey RADIO-1, key-up RADIO-3 on a channel residing on the primary ESS. While RADIO-3 is keyed, restore RDM 1.
- Step 6. Verify RADIO-3 operation on ZoneWatch. RADIO-3 stays on the same channel and the Site remains in wide area trunking.
- Step 7. Verify that RADIO-1 and RADIO-2 receive RADIO-3 audio.
- Step 8. Verify that the UEM reports the recovery of RDM 1.

Pass____ Fail____



System Reliability Features

7.7.123 Redundant Site Controller Switching - Automatic Switchover

1. DESCRIPTION

The Site Controller subsystem uses two Site Controllers in a redundant configuration. The backup Site Controller is made active either upon the loss of communication to the active Site Controller or upon a user initiated command from the Site Control Manager.

This test will demonstrate that on the loss of the active site controller the standby controller will become active and carry on the site operations.

SETUP

RADIO-1 – TALKGROUP 1
RADIO-1 – SITE – SITE 1
RADIO-2 – TALKGROUP 1
RADIO-2 – SITE – SITE 1
RADIO-3 – TALKGROUP 1
RADIO-3 – SITE – SITE 1

All Radios should be "Site Locked".

VERSION #1.020

2. TEST

- Step 1. Verify both Site Controllers are available and in the "Normal" state.
- Step 2. Power off the active Site Controller (or in the ESS configuration connect to the Active Site controller using CSS and perform a "reset") and verify the backup becomes the new active Site Controller (note events in the event viewer).
- Step 3. Key RADIO-1 and verify that RADIO-2 and RADIO-3 hear the audio.
- Step 4. End the call from RADIO-1.
- Step 5. Power up the Site Controller (if it was powered off). Verify the Site Controller returns to the normal state.

Pass____ Fail____



System Reliability Features

7.7.124 Redundant Site Link Failure

1. DESCRIPTION

Communication between the Master Site and the Remote Site can take place over dedicated redundant links. The two links between the Master Site and the Remote Site operate in a hot/standby mode. The system will switch to the backup link if the main LAN or WAN link fails.

Note that the Primary Site Router, if functional, will always be the active router. The Secondary Site Router will only take over when the Primary Site Router is malfunctioning.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - (Site under test)
RADIO-2 - TALKGROUP 1

* The site being tested should have redundant links to the Master Site.

VERSION #1.010

2. TEST

- Step 1. Initiate a Talkgroup Call with RADIO-1 on TALKGROUP 1.
- Step 2. Observe that RADIO-2 is able to monitor and respond to the call.
- Step 3. Remove the WAN link from the active router at the Site under test.
- Step 4. Initiate a Talkgroup Call with RADIO-1 on TALKGROUP 1.
- Step 5. Observe that RADIO-2 is able to monitor and respond to the call.
- Step 6. Replace the WAN link connection that was removed in Step 3.

Pass____ Fail____



System Reliability Features

7.7.125 Redundant Zone Controller Switching/Automatic Switchover

1. DESCRIPTION

In a non-DSR configuration the Zone Controller subsystem uses two Zone Controllers in a redundant configuration. The backup Zone Controller is made active either upon the loss of the active ZC or upon a user command from the Unified Network Configurator (UNC). In a DSR configuration there are 4 Zone Controllers in a redundant configuration. Any one of the 4 could be active to keep the Zone Sites in Wide Area Trunking. If using the Dynamic Resilience Zone configuration the Unified Event Manager will report the Zone Controller switchover in both Unified Event Managers (UEM).

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 1
RADIO-2 - SITE - SITE 2
RADIO-3 - TALKGROUP 1
RADIO-3 - SITE - Site3 (Site3 should be in another Zone if applicable.)

* The Zone Controllers should be successfully synchronized before performing this procedure.

VERSION #1.030

2. TEST

- Step 1. Verify the state of the current Zone Controllers is Active or Standby in the Unified Network Configurator (UNC). (There will be 2 Zone Controllers in single Zone or 4 in the case of DSR zones.)
- Step 2. Reset the active Zone Controller application via the Unified Event Manager (UEM) diagnostic.
- Step 3. Verify using UNC, UEM and ZoneWatch (if applicable) that the standby Zone Controller becomes active and brings all sites back wide. Wait for the Radios to settle out the site affiliations.
- Step 4. Key RADIO-1 and verify that RADIO-2 and RADIO-3 hear the audio.
- Step 5. End the call from RADIO-1.
- Step 6. Verify that Zone Controller that was reset comes back up to a "Standby" state.

Pass____ Fail____



System Reliability Features

7.7.126 Site Failsoft

1. DESCRIPTION

Failure of all control channels, failure of all voice channels, or failure of the site controller will cause a site (RF Subsystem) to enter failsoft operation. Subscribers can be programmed to operate in failsoft by talkgroup; to search its list of control channel frequencies in failsoft; or to disable failsoft altogether. When a site enters failsoft, a radio programmed for failsoft by talkgroup will first look for a specific failsoft channel dictated by the selected talkgroup. Since many systems have different frequencies across sites, if the radio is unable to find the talkgroup's failsoft channel the radio will instead operate in the control channel search failsoft mode. A radio programmed or needing to search control channels for failsoft frequencies will lock onto the first control channel in its control channel list.

Note: Radios should not be site locked when in failsoft mode. The radio will not check the full list of 64 control channels programmed into the radio's code plug. All radios should be programmed to have the same sequence of control channel frequencies.

Note: The subscribers MUST be SmartZone capable.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 1
RADIO-2 - SITE - SITE 1
RADIO-3 - TALKGROUP 2
RADIO-3 - SITE - SITE 1
RADIO-4 - TALKGROUP 2
RADIO-4 - SITE - SITE 1

* Program the Radios for failsoft operation by talkgroup. TALKGROUP 1 should use a different channel for failsoft than TALKGROUP 2 and neither should be a control channel.

* In order to prevent roaming turn off all sites except the site under test.

VERSION #1.010

Use or disclosure of this proposal is subject
PALM BEACH COUNTY RADIO SYSTEM to the restrictions on the cover page.

2. TEST

- Step 1. Using the Unified Event Manager (UEM), place the subsystem into failsoft mode.
- Step 2. Verify that the Radios emits a failsoft tone approximately once every ten seconds.
- Step 3. Initiate a Talkgroup Call from RADIO-1 while in failsoft mode.
- Step 4. Verify that only RADIO-2 can hear RADIO-1.
- Step 5. Dekey RADIO-1 and power down the failsoft channel associated with TALKGROUP 1.
- Step 6. Key RADIO-1 and verify RADIO-2 can still monitor the call but the other radios cannot.
- Step 7. Dekey RADIO-1 and initiate a Talkgroup Call from RADIO-3.
- Step 8. Verify that only RADIO-4 can hear RADIO-3.

Pass_____ Fail_____



System Reliability Features

7.7.127 Station Failure

1. DESCRIPTION

When a base station repeater at one site fails due to hardware problems, the pending call is lost and the trunking controller removes the channel from service system wide. This failure can be created by powering down one base station repeater.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 1
RADIO-2 - SITE - SITE 1

VERSION #1.010

2. TEST

- Step 1. Power down a voice repeater for any voice channel at SITE 1.
- Step 2. Initiate calls using RADIO-1 to step through all available voice channels.
- Step 3. Verify that the disabled channel is not used at SITE 1.

Pass____ Fail____



System Reliability Features

7.7.128 Continued Operation Upon Loss of Prime Site Switch

1. DESCRIPTION

The Simulcast Prime Site High Availability feature enhances current operation by increasing the number of channels available following a LAN switch failure. These sites are configured with four LAN switches rather than the standard two LAN switch configuration. When the same site resources are spread across four LAN switches, the failure of a single switch removes fewer resources hence improving the general availability of resources as well as improving the likelihood of preserving redundancy.

Per current operation, these sites are expected to preserve wide area operation upon failure of any of the switches (assumes redundant WAN links are utilized between the master site and prime site). This test case will demonstrate continued wide area operation upon a single switch failure. It also demonstrates increased channel availability over the standard 2 LAN switch configuration.

SETUP

RADIO-1 TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 TALKGROUP 1
RADIO-2 - SITE - SITE 2
RADIO-3 TALKGROUP 1
RADIO-3 - SITE - SITE 1

Channel 2 (on switch 2) is set as the preferred control channel. Channel 4 is the next preferred. Redundant WAN links are configured between the master site and prime site.

Ensure Zone Watch is setup to monitor the sites and the Unified Event Manager (UEM) is available for viewing faults.

Note: Switch failures may be simulated by pulling power on the switch.

VERSION #1.010

Use or disclosure of this proposal is subject
PALM BEACH COUNTY RADIO SYSTEM to the restrictions on the cover page.



2. TEST

- Step 1. Verify that the SITE 1 is in wide area trunking. (Normal Operation)
- Step 2. Fail switch 2 and verify that the Site remains in wide area trunking.
- Step 3. Verify that the UEM reports the failure of switch 2.
- Step 4. Verify in ZoneWatch that channels on switches 1, 3 and 4 are available.
- Step 5. Key-up RADIO-1 on a channel connected to switch 1 and verify that RADIO-2 and RADIO-3 receive RADIO-1 audio. Repeat this step for channels connected to switch 3 and 4 also.

Pass_____ Fail_____



DYNAMIC SYSTEM RESILIENCE FATP AND SATP

7.7.129 Automatic Registration Server (Presence Notifier) Registration

1. DESCRIPTION

This test shows that in the event of a Primary HA Packet Data Gateway failure, the (ARS) will continue to operate using the Secondary HA Packet Data Gateway to reach its Presence clients.

Note: This test applies to IV&D only. During the switchover, some data packets may be lost as the Primary PDG is switched.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1

VERSION #1.020

2. TEST

- Step 1. Register with Automatic Registration Server (ARS).
- Step 2. In the vCenter Application or at the Unified Event Manager, verify that the Packet Data Gateway on VMS01 is Primary.
Note: for M1 only the single Ethernet link between PDG and GGSN needs to be disconnected
- Step 3. In the VMWare vSphere Client for VMS01, select 'Reboot'.
- Step 4. Observe that the Unified Event Manager remains in communication with the Packet Data Gateway 1 and verify Packet Data Gateway 1's Redundancy state is 'Active' using the Unified Network Configurator (UNC) "Quick Commands".
- Step 5. Observe in the Unified Event Manager the Link Status of the Packet Data Gateway's common managed links do not change.
- Step 6. Verify that RADIO-1 remains registered with the ARS.

Pass____ Fail____

Dynamic System Resilience

7.7.130 Gateway GPRS Support Node 1 Failure

1. DESCRIPTION

This test will demonstrate that in the event of a failure of the Gateway General Packet Radio Services (GPRS) Support Node (GGSN) in the Primary Core, the Backup Core Packet Data Gateway becomes active. After the GGSN failure, the Primary Core Packet Data Gateway reports an inoperable state and data functionality will continue to be provided on the Backup Core Packet Data Gateway.

Note: This test case applies to the following data services - Trunking IV&D, HPD and Conventional IV&D data. The test case can be executed with any or all of the supported data services and should include the appropriate packet data gateways, sites and the radio personalities in the setup of the test case.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
Packet Data Gateway 1: Active
Packet Data Gateway 2: Standby

VERSION #1.020

2. TEST

- Step 1. Send inbound data from RADIO-1, then send outbound data to RADIO-1.
- Step 2. Pull the power cord to GGSN 1 in the Primary Core.
- Step 3. Observe, in the Primary Core Unified Event Manager and Backup Core Unified Event Managers, the Packet Data Gateway 1's Application State transition to 'Inoperable'.
- Step 4. Verify Packet Data Gateway 2's Redundancy state is 'Active' using the Unified Network Configurator (UNC) "Quick Commands" or the Unified Event Manager in the Primary and Backup Core.
- Step 5. Observe, in both Unified Event Managers, the Link Status of the Packet Data Gateway's common managed links transition through various states to 'Up'.
- Step 6. Verify that radios automatically context activate.
- Step 7. Send inbound data from RADIO-1, then send outbound data to RADIO-1.
- Step 8. Plug the power cord in to GGSN 1 in the Primary Core.

Pass____ Fail____



7.7.131 OTAR Registration on
Packet Data Gateway Failure

1. DESCRIPTION

In a system with Dynamic System Resilience (DSR), each zone has three Packet Data Gateways (PDG) for each Integrated Voice & Data (IV&D), High Performance Data (HPD) data and/or Conventional Integrated Voice & Data service; one PDG in the primary core, and one PDG in the backup core. The PDGs securely communicate to automatically select one active PDG. The selection algorithm is weighted to give preference to the PDG serving the most number of sites or the PDG in the primary core if the number of serving sites is equal. The standby PDG does not synchronize any context databases with the active PDG.

This test will demonstrate in the event of a Primary Core Packet Data Gateway failure, the Key Management Facility will continue to operate using the backup mechanism available with Dynamic System Resilience (DSR) to reach its Over the Air Rekeying (OTAR) clients

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
Packet Data Gateway 1: Active
Packet Data Gateway 2: Standby

VERSION #1.020

2. TEST

- Step 1. Register RADIO-1 with the Key Management Facility.
- Step 2. Disconnect the Ethernet links for the Packet Data Router and Radio Network Gateway in the Primary Core.
- Step 3. Verify in the Primary Core Unified Event Manager and Backup Core Unified Event Manager an event is received for Comm Loss for Packet Data Gateway 1.
- Step 4. Verify Packet Data Gateway 2's Redundancy state is 'Active' using the Unified Network Configurator (UNC) "Quick Commands" or the Unified Event Manager in the Primary and Backup Core.
- Step 5. Observe, in both Unified Event Managers, the Link Status of the Packet Data Gateway's managed links transition through various states to 'Up'.
- Step 6. After a short period, verify that the radio automatically context activates.
- Step 7. Verify that RADIO-1 re-registers with the Key Management Facility.

Pass____ Fail____



Dynamic System Resilience

7.7.132 Manual Synchronization of Provisioning Manager / Unified Network Configurator

1. DESCRIPTION

This test demonstrates that the standby Provisioning Manager Server and the standby Unified Network Configurator can be manually synchronized to their active counterparts, for upgrade scenarios.

SETUP

Provisioning Manager Server 1: Active
Provisioning Manager Server 2: Standby
Unified Network Configurator 1: Active
Unified Network Configurator 2: Standby
Default automatic synchronization interval is 24 hours

For a M3 Mixed Zone (nonDSR and DSR zones in system). PM 1 and UNC 1 should be placed in a nonDSR zone and PM2 and UNC 2 should be placed in a backup core of a DSR zone.

VERSION #1.020

2. TEST

- Step 1. Configure 2 radios on the Provisioning Manager Server 1 and commit the additions.
- Step 2. Change two timer values in the UNC Wizard on Unified Network Configurator 1 and commit the additions.
- Step 3. Before the automatic synchronization is due to occur, perform manual switchover of the Provisioning Manager and Unified Network Configurator to make both Provisioning Manager 2 and Unified Network Configurator 2 go active.
- Step 4. Verify that the changes made on Provisioning Manager 1 and Unified Network Configurator 1 are absent on Provisioning Manager 2 and Unified Network Configurator 2.
- Step 5. Configure 2 radios (different than those in Step 1) on Provisioning Manager 2 and commit the additions.
- Step 6. Change two timer values in the UNC Wizard (different than that in Step 2) on Unified Network Configurator 2 and commit the additions.
- Step 7. Before the automatic synchronization is due to occur, perform a manual synchronization.
- Step 8. Verify from the administration menu of both the Unified Network Configurator and Provisioning Manager that the manual synchronization was successful.
- Step 9. Perform manual switchover of the Provisioning Manager and Unified Network Configurator to make both Provisioning Manager 1 and Unified Network Configurator 1 go active.
- Step 10. Verify that the Unified Network Configurator 1 and User Configuration Manager 1 have the data which was configured in Steps 5 & 6.

Pass_____ Fail_____



Dynamic System Resilience

7.7.133 MOSCAD Failure

1. DESCRIPTION

In a system with Dynamic System Resilience (DSR), MOSCAD components in a master site primary core are duplicated in the backup core. This includes the SDM3000 Network Translator (SNT) server and the Graphical Master Computer (GMC) server. This test demonstrates that when a MOSCAD device in the Primary Core fails, an alarm is reported to both the Primary Core and Backup Core Unified Event Managers.

SETUP

No prior setup is required.

VERSION #1.010

2. TEST

- Step 1. Disconnect MOSCAD RTU 1's link from the network.
- Step 2. Verify, on both Unified Event Managers, that MOSCAD RTU 1 has lost communication with the Unified Event Manager.
- Step 3. Verify, on both the MOSCAD GMCs, that the MOSCAD RTU has lost communication with the GMC
- Step 4. Connect MOSCAD RTU 1's link to the network.
- Step 5. Verify, on both Unified Event Managers, that MOSCAD RTU 1 has returned to service.
- Step 6. Verify, on both the MOSCAD GMCs, that the MOSCAD RTU now has communication with the GMC

Pass____ Fail____



Dynamic System Resilience

7.7.134 Primary Core Failure - Switchover to Back-up Core (Voice and Data Services)

1. DESCRIPTION

Dynamic System Resilience (DSR) allows a system to continue to function with minimal loss of voice and/or Data communications due to the failure of any controlling master site.

This test will demonstrate in the event of a complete Primary Core failure, the Backup Core takes over in order to return the system back to wide area trunking. Some of the Backup Core equipment automatically takes over while the Network Management servers like the Provisioning Manager Server and Unified Network Configurator require manual switchover.

Note: This test case applies to the following data services - Trunking IV&D, HPD and Conventional IV&D data. The test case can be executed with any or all of the supported data services and should include the appropriate packet data gateways, sites and the radio personalities in the setup of the test case.

SETUP

RADIO-1 - TALKGROUP 1

RADIO-1 - SITE - SITE 1

RADIO-2 - TALKGROUP 1

RADIO-2 - SITE - SITE 1

RADIO-5 - TALKGROUP 1

Mobile Data Terminal (MDT) connected to RADIO-5
UDP Tool installed on both the MDT and Host computers

Zone Controller 1: Active

Zone Controller 2: Standby

Zone Controller 3: Standby

Zone Controller 4: Standby

Packet Data Gateway 1: Active

Packet Data Gateway 2: Standby

Unified Network Configurator 1: Active

Unified Network Configurator 2: Standby

User Configuration Manager: Active

User Configuration Manager 2: Standby

System Statistics Server 1: Active

System Statistics Server 2: Active

VERSION #1.040

2. TEST

- Step 1. Initiate a TALKGROUP 1 call from RADIO-1. Verify that RADIO-2 receives the audio.
- Step 2. Using RADIO-5 MDT, configure the data application for periodic inbound data messages. (1 message every 30 seconds) Observe at the Host PC that data messages are received.
- Step 3. Pull the power cords to the Primary Core LAN Switches 1 & 2. (Also the redundant power supply (RPS) if equipped.)
- Step 4. In the Unified Network Configurator (UNC), select Zone Controllers 1 through 4 and check the redundancy state using the Quick Command feature. (Note: In a single Zone system or when the test is run on the Zone with the primary core system servers the backup UNC will need to be manually enabled to run the quick command.)
- Step 5. Verify that Zone Controller (ZC) 3 is Active. (Note that the transition of ZC 3 to the "Active" state causes the currently active ZC to reset and the sites will temporarily lose Wide Area Trunking while the connection to ZC 3 is established.)
- Step 6. In the Unified Network Configurator, select any of the Packet Data Gateways 1 and 2 and check the redundancy state using the Quick Command feature.
- Step 7. Verify that Packet Data Gateway 2 is Active.
- Step 8. Initiate a TALKGROUP 1 call from RADIO-1. Verify that RADIO-2 receives the audio.
- Step 9. Observe at the Host PC that received data messages have continued.
- Step 10. If the backup servers were enabled for the test, they should now be disabled. Return the system to normal by powering up the core switches. Verify once the Zone Controllers start to communicate only 1 Zone Controller will be active.

Pass_____ Fail_____



Dynamic System Resilience

7.7.135 Primary Core Link Failure - Ethernet Console Site Link

1. DESCRIPTION

This test will demonstrate that in the event of a failure of a link to the Primary Core, the Console Site Router routes packets through the Backup Core to the Primary Core. The Site Control Paths are unaffected by the failure.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 1
RADIO-2 - SITE - SITE 2
CONSOLE-1 - TALKGROUP 1
CONSOLE-1 - SITE - CONSITE 1
Zone Controller 1: Active
Zone Controller 2: Standby (Does not apply for M1 DSR)
Zone Controller 3: Standby
Zone Controller 4: Standby (Does not apply for M1 DSR)

VERSION #1.020

2. TEST

- Step 1. Initiate a Talkgroup call from CONSOLE-1 on TALKGROUP 1. Verify that RADIO-1 and RADIO-2 receive audio.
- Step 2. Pull the power cords to both the Core Routers in the Primary Core.
- Step 3. Observe, in both Unified Event Managers, both the Core Routers in the Primary Core have failed.
- Step 4. Verify, via the Unified Event Manager (e.g. in the Primary Core), that Zone Controllers 1 and 2, and the Consoles in the site are unaffected by the Console site link outage. The Zone Controller state can also be found using the UNC "Quick Command" feature. Note: For M1 ZC2 is not present
- Step 5. Initiate a Talkgroup call from CONSOLE-1 on TALKGROUP 1. Verify that RADIO-1 and RADIO-2 receive audio.
- Step 6. Plug in the power cords to both the Core Routers in the Primary Core. Upon restoration of the link, the Console Site Router routes packets to the Primary Core.
- Step 7. Initiate a Talkgroup call from CONSOLE-1 on TALKGROUP 1. Verify that RADIO-1 and RADIO-2 receive audio.

Pass____ Fail____



Dynamic System Resilience

7.7.136 Single Ethernet Link RF Site Router Path Failure

1. DESCRIPTION

This test will demonstrate in the event of a failure of an RF Site Router's Ethernet link path to the Primary Core, in a single site router configuration, the RF Site Router routes packets through the Backup Core to the Primary Core. The Site Control Paths are unaffected by the failure.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 1
RADIO-2 - SITE - SITE 2
Zone Controller 1: Active
Zone Controller 2: Standby (Does not apply for M1 DSR)
Zone Controller 3: Standby
Zone Controller 4: Standby (Does not apply for M1 DSR)

VERSION #1.020

2. TEST

- Step 1. Initiate a Talkgroup call from RADIO-1 on TALKGROUP 1. Verify that RADIO-2 receives the audio.
- Step 2. Pull the power cords to both the Core Routers in the Primary Core.
Note: For M1 this is only one Core Router in the primary and one Core Router in the backup core.
- Step 3. Observe, in both Unified Event Managers, both the Core Routers in the Primary Core have failed.
- Step 4. Verify, via the Unified Event Manager (e.g. in the Primary Core), that Zone Controllers 1 and 2, Packet Data Gateway1 and the RF sites are unaffected by the RF site link outage.
- Step 5. Initiate a Talkgroup call from RADIO-1. Verify RADIO-2 receives the audio.
- Step 6. Plug the power cords in to both the Core Routers in the Primary Core.
Note: For M1 this is only one Core Router in the primary and one Core Router in the backup core.

Pass____ Fail____



NETWORK SECURITY TESTS FATP AND SATP

7.7.137 Virus Protection (McAfee Antimalware)

1. DESCRIPTION

The network clients in the system are protected by anti-virus software. In this test, a mock virus will be introduced to the system. This test virus was developed by the European Institute for Computer Anti-Virus Research (EICAR) to provide an easy and safe way to test whether the anti-virus software is working, and see how it reacts when a virus is detected. This is a 70-byte file, which if executed, simply displays the message: "EICAR-STANDARD-ANTIVIRUS-TEST-FILE!"

SETUP

Acquire the EICAR test virus file (http://www.eicar.org/anti_virus_test_file.htm), and place it on a removable media drive.

VERSION #1.040

2. TEST

- Step 1. Log on to the NM client using your Active Directory account that is a member of the Installation Administrator or Platform Administrator group (instadm or netwadm).
- Step 2. Insert removable media with the EICAR test virus on a NM client. Attempt to execute the EICAR test virus.
- Step 3. McAfee Antimalware software on the NM client will Quarantine the EICAR virus upon execution and logs a Malware detection event to Windows event log. Verify the Error message ID "259" under Windows Application events. McAfee Antimalware software on the NM client will also notify the malware detection event to McAfee ePO Server (CSMS).
- Step 4. Log on to CSMS using the Windows "administrator" account.
- Step 5. Start the ePO Server console by double-clicking the Launch McAfee ePolicy Orchestrator Web Console icon on the CSMS Windows desktop that appears.
- Step 6. Log on to ePO administrative console by using account that has administrative privilege to View threat events on forwarded by endpoint device (NM Client).
- Step 7. From McAfee ePolicy Orchestrator Web Console Menu perform the following steps: Select Reporting, Select Queries & Reports. In the Quick Find field type MSI, click Apply. Locate query MSI: All Events and click Run (to the right of the query name)
Note: Depending on the number of systems and event it may take several minutes to display results.
- Step 8. Review Threat Events or use custom filtering to create a smaller subset. When done click Close on (lower right of the screen)

Pass____ Fail____



ISSI 8000 FATP AND SATP

7.7.138 Automatic Roaming - Talkgroup Call for Home Talkgroup

1. DESCRIPTION

This test will demonstrate that a group call initiated from a home radio/console in the local system that is affiliated to a home talkgroup can be heard by a home radio that has roamed to a foreign system and is affiliated to the home talkgroup.

This test will also demonstrate that a group call initiated from a home radio that has roamed to a foreign system and is affiliated to a talkgroup home to the local system can be heard by home radio and console affiliated to the home talkgroup in the local system.

SETUP

SYSTEM 1 (home of TALKGROUP 1)

RADIO-1 (home radio on SYSTEM 1, has roamed to SYSTEM 2) - TALKGROUP 1

RADIO-2 - TALKGROUP 1

CONSOLE-1 - TALKGROUP 1

RADIO-2 and CONSOLE-1 (home to SYSTEM 1, located in SYSTEM 1) - TALKGROUP 1

SYSTEM 2

RADIO-1 - TALKGROUP 1

VERSION #1.020

2. TEST

- Step 1. Initiate a group call from RADIO-2 on TALKGROUP 1.
- Step 2. Observe that RADIO-1 and CONSOLE-1 are able to monitor and respond to the call on TALKGROUP 1.
- Step 3. Initiate a group call from CONSOLE-1 on TALKGROUP 1.
- Step 4. Observe that RADIO-1 and RADIO-2 are able to monitor and respond to the call on TALKGROUP 1.
- Step 5. Initiate a group call from RADIO-1 on TALKGROUP 1.
- Step 6. Observe that RADIO-2 and CONSOLE-1 are able to monitor and respond to the call on TALKGROUP 1.

Pass____ Fail____



7.7.139 Automatic Roaming - Emergency Alarm and Call for Home Talkgroup

1. DESCRIPTION

This test will demonstrate that emergency alarm and call initiated from a home radio that has roamed to a foreign system and is affiliated to a talkgroup home to the local system can be heard by a console that is affiliated to the home talkgroup in the local system. This test also verifies that the emergency can be acknowledged and knocked down by the console in the local system.

SETUP

SYSTEM 1 (home of TALKGROUP 1)
CONSOLE-1 - TALKGROUP 1

SYSTEM 2
RADIO-1 - TALKGROUP 1

RADIO-1 is a home radio on SYSTEM 1, has roamed to SYSTEM 2 and is affiliated to TALKGROUP 1.

CONSOLE-1 is home to SYSTEM 1, located in System 1 and affiliated to TALKGROUP 1.

VERSION #1.020

2. TEST

- Step 1. Initiate an emergency alarm from RADIO-1 on TALKGROUP 1 by holding the emergency button.
- Step 2. Observe that CONSOLE-1 is able to hear and see the emergency alarm on TALKGROUP 1.
- Step 3. Acknowledge the emergency alarm on TALKGROUP 1 from CONSOLE-1.
- Step 4. Key RADIO-1 to initiate an emergency call on TALKGROUP 1.
- Step 5. Observe that CONSOLE-1 is able to monitor and respond to the emergency call on TALKGROUP 1.
- Step 6. Knock down the emergency from CONSOLE-1 on TALKGROUP 1.
- Step 7. Exit emergency mode on RADIO-1 by holding the emergency button on the radio.

Pass_____ Fail_____

7.7.140 Automatic Roaming - Talkgroup Call for Foreign Talkgroup

1. DESCRIPTION

This test will demonstrate that a group call initiated from a home radio/console in the local system that is affiliated to a foreign talkgroup can be heard by a home radio that has roamed to the foreign system and is affiliated to the foreign talkgroup.

This test will also demonstrate that a group call initiated from a home radio that has roamed to a foreign system and is affiliated to a talkgroup home to the foreign system can be heard by home radio and console affiliated to the foreign talkgroup in the local system.

SETUP

SYSTEM 2 (home of TALKGROUP 2)
RADIO-1 - TALKGROUP 2
RADIO-1 (home radio on SYSTEM 1, has roamed to
SYSTEM 2) - TALKGROUP 2
RADIO-2 and CONSOLE-1 are home to SYSTEM 1,
located in SYSTEM 1 and affiliated to TALKGROUP
2.

SYSTEM 1
RADIO-2 - TALKGROUP 2
CONSOLE-1 - TALKGROUP 2

VERSION #1.020

2. TEST

- Step 1. Initiate a group call from RADIO-2 on TALKGROUP 2.
- Step 2. Observe that RADIO-1 and CONSOLE-1 are able to monitor and respond to the call on TALKGROUP 2.
- Step 3. Initiate a group call from CONSOLE-1 on TALKGROUP 2.
- Step 4. Observe that RADIO-1 and RADIO-2 are able to monitor and respond to the call on TALKGROUP 2.
- Step 5. Initiate a group call from RADIO-1 on TALKGROUP 2.
- Step 6. Observe that RADIO-2 and CONSOLE-1 are able to monitor and respond to the call on TALKGROUP 2.

Pass____ Fail____



DISASTER RECOVERY FATP AND SATP

Disaster Recovery ASTRO 25 Simulcast Prime Sites Switching Tests

7.7.141 Main Prime to Backup Prime

1. DESCRIPTION

This test will demonstrate the ASTRO 25 Simulcast Prime Sites manual switching from the Main Simulcast Prime Site to the Backup Simulcast Prime site.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 1
RADIO-3 - TALKGROUP 2
RADIO-4 - TALKGROUP 2

VERSION #1.0

2. TEST

- Step 1. Initiate a Wide Area Call with RADIO-1 in TALKGROUP 1.
- Step 2. Observe that only RADIO-2 will be able to monitor and respond to the call.
- Step 3. Initiate a Wide Area Call with RADIO-3 in TALKGROUP 2.
- Step 4. Observe that only RADIO-4 will be able to monitor and respond the call.
- Step 5. Switch from main prime to backup prime site following switching procedure in the Disaster Recovery Switching Utility document.
- Step 6. Wait for the site switch to complete
- Step 8. Initiate a Wide Area Call with RADIO-1 in TALKGROUP 1.
- Step 9. Observe that only RADIO-2 will be able to monitor and respond to the call.
- Step 10. Initiate a Wide Area Call with RADIO-3 in TALKGROUP 2.
- Step 11. Observe that only RADIO-4 will be able to monitor and respond the call.

Pass_____ Fail_____



Disaster Recovery ASTRO 25 Simulcast Prime Sites Switching Tests

7.7.142 Backup Prime to Main Prime

1. DESCRIPTION

This test will demonstrate the ASTRO 25 Simulcast Prime Sites manual switching from the Backup Simulcast Prime site to the Main Simulcast Prime Site.

SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 1
RADIO-3 - TALKGROUP 2
RADIO-4 - TALKGROUP 2

VERSION #1.0

Main Master/Main Prime Total Site Lost Disaster Recovery Simulation FATP AND SATP

Main Site Isolation

2. TEST

- Step 1. Initiate a Wide Area Call with RADIO-1 in TALKGROUP 1.
- Step 2. Observe that only RADIO-2 will be able to monitor and respond to the call.
- Step 3. Initiate a Wide Area Call with RADIO-3 in TALKGROUP 2.
- Step 4. Observe that only RADIO-4 will be able to monitor and respond the call.
- Step 5. Switch from backup prime to main prime site following switching procedure in the Disaster Recovery Switching Utility document.
- Step 6. Wait for the site switch to complete
- Step 8. Initiate a Wide Area Call with RADIO-1 in TALKGROUP 1.
- Step 9. Observe that only RADIO-2 will be able to monitor and respond to the call.
- Step 10. Initiate a Wide Area Call with RADIO-3 in TALKGROUP 2.
- Step 11. Observe that only RADIO-4 will be able to monitor and respond the call.

Pass____ Fail____

1. DESCRIPTION

This test will simulate total loss of the Main site and its disaster recovery. The simulation will isolate all the key network components for the collocated Main Master and Main Prime site from rest of system's network.

NOTE: Make sure that the ASTRO 25 Main Simulcast Prime Site is active and the Backup Conventional Prime is the active prime site.



SETUP

RADIO-1 - TALKGROUP 1
RADIO-2 - TALKGROUP 1

VERSION #1.0

2. TEST

Step 1. Power down the Main Master Site Backhaul SW1 and Backhaul SW2.

Step 2. Power down the Main Prime Site Backhaul SW1 and Backhaul SW2.

NOTE: At this point the system will be "Out of Range" as there are no remote sites available.

Step 4. At the Backup Master site perform the switch from ASTRO 25 Main Simulcast Prime site to ASTRO 25 Backup Simulcast Prime Site per Disaster Recovery Switching Utility document.

Step 5. After the switch is completed the system will be in wide area and operations can be performed from the Dispatch Site.

Step 6. Initiate a Wide Area Call with RADIO-1 in TALKGROUP 1.

Step 7. Observe that only RADIO-2 and MCC 7500 OP will be able to monitor and respond to the call.

Step 8. Return system back to normal operations.

Pass____ Fail____



Site Measurements FATP AND SATP

7.7.143 Base Station Transmit Output Power (GTR)

1. DESCRIPTION

Base station transmit output power is measured by locally keying the base station and measuring the output power with a wattmeter connected to the base station's transmit (TX) port. The output power of every base station was tested as part of the individual unit's tests in Motorola' manufacturing process, and will also be tested as part of the Field Acceptance Test Plan

SETUP

Required equipment: appropriate wattmeter for the station to be tested (band-specific). Optional configuration software and associated client to run the configuration software. Create a table for the site to be tested; this table will be used to record the measurements.

VERSION #1.000

2. TEST

- Step 1. Disable all base stations using a management terminal/configuration software.
- Step 2. Insert a wattmeter between Base Station #1's TX antenna port and the corresponding base station's combiner/duplexer/antenna destination port.
- Step 3. Turn on Base Station #1's Power Amplifier (key) using local management terminal/configuration software.
- Step 4. Measure the base-station output power and record the measurement in the separately created table.
- Step 5. De-key the base station under test by de-activating the PA via local management terminal/configuration software.
- Step 6. Repeats Steps 2-5 for the remaining base stations at the site.
- Step 7. Restore all antenna connections when completed.
- Step 8. Verify that all measured output power of each station shall adhere to the base station's FCC-licensed output power requirements.

Pass____ Fail____



Site Measurements

7.7.144 Transmitter Combiner Port Power Loss

1. DESCRIPTION

The transmitter combiner port power losses are tested by taking RF power measurements at various points in the radio-frequency (RF) distribution network. The RF power level is measured when a single base station has its power amplifier (PA) engaged (keyed). The first measurement is made with a wattmeter placed on the base station port of the combiner. A second measurement is taken with the wattmeter placed on the antenna port of the combiner. The difference between the two measurements is the combiner loss, typically specified in Decibels (dB).

SETUP

Required equipment: appropriate wattmeter for the station to be tested (band-specific). Optional configuration software and associated client to run the configuration software. Create a table for the site to be tested; this table will be used to record the measurements.

VERSION #1.090

2. TEST

- Step 1. Disable all base stations using either the access enable/disable button located on the front panel, or via a management terminal/configuration software, and disconnect the transmission line jumper from the combiner's station input port for the base station.
- Step 2. Insert a wattmeter between the combiner's station port and the transmission line jumper, and turn on Base Station #1's Power Amplifier (key) using the local Push-To-Talk (PTT) button located on the front panel, or via a local management terminal/configuration software.
- Step 3. Measure the combiner's station port input power and record the measurement in the table created previously.
- Step 4. De-key the base station under test by releasing the local PTT button, or by deactivating the PA via a local management terminal/configuration software, remove the wattmeter, reconnect the transmission line jumper to the combiner's station input port, and
- Step 5. Insert a wattmeter between the combiner's antenna port and the TX antenna transmission line, and repeat Step 4.
- Step 6. Measure the combiner's antenna port output power and record the measurement in the table.
- Step 7. De-key the base station under test by releasing the local PTT button, or by deactivating the PA via a local management terminal/configuration software.
- Step 8. Calculate the Transmitter Combiner Port Power Loss by taking the difference between the Combiner Output Power (Step 3) and the Combiner Input Power (Step 6), and then convert the measurements to Decibels using the formula $-dB = 10 \log(\text{Step 3/Step 6})$.
Reco
- Step 9. Repeat step 1 through step 8 for the remaining used transmitter combiner ports at the site.
- Step 10. Restore all connections when completed. Verify that the Transmitter Combiner Port Power Loss (Insertion Loss) does not exceed the manufacturer's specifications.

Pass ____ Fail ____



Site Measurements

7.7.145 Transmitter Antenna Network Reflected Power

1. DESCRIPTION

The Transmitter Antenna Network Reflected Power test will measure the amount of transmitted radio frequency (RF) power reflected back through the transmitter antenna network and into the transmitter combining network. The RF network must be fully installed and optimized prior to being used. This includes the TX transmission line and the TX antenna. The first measurement is made with a wattmeter placed on the antenna port of the combiner. A second measurement is taken with the wattmeter placed on the antenna port of the combiner with the element reversed.

SETUP

Required equipment: appropriate wattmeter for the station to be tested (band-specific). Optional configuration software and associated client to run the configuration software. Create a table for the site to be tested; this table will be used to record the measurements, and should include the channel-by-channel tests from the "Transmitter Combiner Port Power Loss" test.

VERSION #1.070

2. TEST

- Step 1. Disable all base stations using either the access enable/disable button located on the front panel, or via a management terminal/configuration software.
- Step 2. Insert a wattmeter between Base Station #1's TX antenna port and the corresponding base station's combiner/duplexer/antenna destination port.
- Step 3. Turn on Base Station #1's Power Amplifier (key) using the local Push-To-Talk (PTT) button located on the front panel, or via a local management terminal/configuration software.
- Step 4. Measure the transmit antenna network's reflected power and record the measurement in the previously created table.
- Step 5. De-key the base station under test by releasing the local PTT button, or by deactivating the PA via a local management terminal/configuration software.
- Step 6. Calculate the Reflected Power Ratio using the formula $\% = (\text{Step 4/Combiner Output Port Power}) * 100$. This is the Reflected Power Ratio.
- Step 7. Repeats Steps 2-6 for the remaining base stations at the site.
- Step 8. Restore all antenna connections when completed.
- Step 9. The reflected power from the TX antenna network shall not exceed a ratio of 5% reflected power to forward power.

Pass____ Fail____



Site Measurements

7.7.146 Effective System Sensitivity

1. DESCRIPTION

The effective system sensitivity will be measured at completion of the site's installation and optimization work.

SETUP

Signal generator, 12 dB SINAD meter, and a calibrated service monitor. Create a table to record the values of this test.

VERSION #1.030

2. TEST

- Step 1. Connect a signal generator into the receiver multicoupler's test port.
- Step 2. Connect a 12 dB SINAD meter or service monitor to the base station's service port under test.
- Step 3. Inject the base station receive frequency RF carrier modulated with a 1 kHz tone at 3 kHz deviation for the base station under test.
- Step 4. Adjust the service monitor's RF carrier level until a 12 dB reading is obtained on the 12 dB SINAD meter or service monitor.
- Step 5. Record the service monitor's RF carrier level.
- Step 6. Restore all connections when completed.
- Step 7. Calculate the effective system sensitivity by using the formula $\text{dBm} = \text{Step 5} + \text{Test Port Cable Loss} + \text{Service Monitor ISO-T Loss}$.
- Step 8. There is no pass/fail criteria for this test. The purpose of this test is to keep a baseline record of effective system sensitivity for future reference and maintenance. This test does not need to be repeated for the remaining base stations.

Pass____ Fail____



FACTORY ACCEPTANCE TEST PLAN

FOR

PALM BEACH COUNTY

DIGITAL MICROWAVE SYSTEM

Aviat Networks Project #NA150417-47883

Sample

Note: This document is generated specifically for this Sales Order.

AGENDA

- ❑ ARRIVAL AND INTRODUCTIONS (conference room).
- ❑ FACTORY ACCEPTANCE TEST OVERVIEW / WHAT TO EXPECT / REVIEW FAT PLAN.
- ❑ SYSTEM TOUR AND FAMILIARIZATION.
- ❑ FACTORY ACCEPTANCE TEST (FAT)
(Unless otherwise specified, tests will be performed on several sites selected at the time of FAT)

1. PERFORM A VISUAL INSPECTION AND INVENTORY EQUIPMENT.
2. VERIFY SOFTWARE VERSIONS.
3. VERIFY TRANSMITTER AND RECEIVER FREQUENCIES.
4. VERIFY RADIO TRANSMIT POWER OUTPUT AT THE RACK (100W).
5. VERIFY RECEIVER THRESHOLD.
6. VERIFY END-TO-END CIRCUIT ASSIGNMENT AND CONTINUITY AT ALL SITES.
7. VERIFY DAC16x CARD FUNCTIONALITY.
8. PERFORM A LONG TERM BER TEST (overnight test).

Objective: The residual BER test shall be made under NO FADE CONDITIONS. The test period shall be 12 hours with BER not to exceed the test objective of $N \times 10^{-12}$, where “N” is equal to the number of radio hops (one way).

9. CHECK LONG TERM BER OVERNIGHT TESTING.
 10. VERIFY PROTECTION SWITCHING.
 11. DAC GEOPORT – ETHERNET THROUGHPUT TESTING.
 12. ADTRAN LOCAL PHONE TESTING.
 13. DEMONSTRATE PROVISION NMS- OPERATIONAL CAPABILITIES TO INCLUDE ALARMS REPORTING, CONFIGURATION, AND CONTROLS FUNCTIONALITY.
- ❑ REVIEW FAT RESULTS AND SIGN-OFF ON “ACTION ITEMS” (conference room).
 - ❑ DISCUSS PLANS FOR SHIPMENT (conference room).
 - ❑ AUTHENTICATE SHIPMENT. SIGN-OFF ON CERTIFICATE OF ACCEPTANCE (conference room).

□ **FACTORY ACCEPTANCE TEST (FAT)**

□ **OVERVIEW**

Prior to Factory Acceptance Test, Aviat Networks and Vendor manufactured equipment are staged on the factory floor and connections are made to simulate network connections and system layout per system documentations prepared by Aviat Networks' Configuration Engineering team. Transmission measurements are conducted between coordinating radio assemblies to assess the overall radio equipment operation. TDM channels and/or Ethernet channels are provisioned per the channel plan and each channel is tested to the specification using appropriate test sets and procedures. For the vendor equipment, tests are conducted in accordance with recommendations stated in the appropriate product manual(s). Network Management System monitoring and control functionalities will be verified using the Provision NMS provided for Palm Beach County system.

□ **SCOPE OF WORK**

Aviat Networks staff will perform the tests as outlined. Any exceptions, additions, or deletions will be noted in the appropriate section of the FAT document. The customer representative(s) that witnessed the FAT test process will initial each test of the master copy of FAT document upon completion of the test. The Aviat Networks representative will also initial each test as the test program progresses. The primary representative for each party will sign the Certificate of Acceptance upon completion of the tests. The signatories are stating that they have witnessed the FAT as defined in this document, and that witnessed test values were within the specification of recorded test results on factory test data forms.

□ **ETHERNET TESTING**

The RFC2544 Throughput Test method is used for evaluating the transfer performance of the equipment.

Throughput

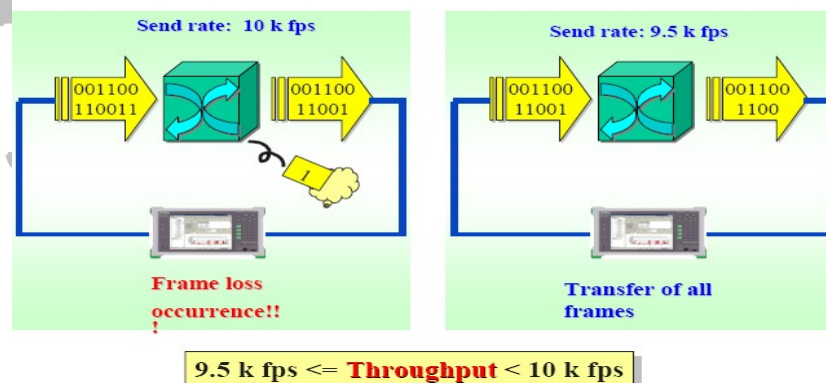
Throughput is a measure of how many input frames the network equipment can transfer without dropped frames.

Throughput is measured by inputting frames to the device under test (DUT) at a known rate and checking whether or not the transferred frames are lost. The input frame rate is changed to measure the maximum rate at which frames can be transferred without loss.

Here's a concrete example.

First, frames are input to the DUT at a rate of 10 k fps. The DUT is not able to transfer all the input frames and part of the frames seem to be lost. In this case, the frame input rate is lowered to 9.5 k fps and the test is performed again. In this case all the frames are transferred. As a result, the DUT Throughput is evaluated as being between 9.5 and 10 K fps. Naturally, if all the frames are transferred without loss in the first test, the frame input rate is raised and the test is rerun. The frame transfer performance is measured at different rates at different frame sizes and the maximum rate at which frames are transferred without frame loss is the Throughput.

RFC2544 Throughput Measurement Method



□ **TEST FAILURE HANDLING PROCESS**

In the unlikely event that any component should fail during factory acceptance testing, or fail to meet the criteria specified to pass a specific test:

- a) Where a failed component can be immediately replaced, it will be and testing will continue as per the test procedure.
- b) If a system test should fail, factory engineers will be given an opportunity to remedy the problem. A re-test will then be performed

□ **ACCEPTANCE CRITERIA**

A punch list of open items will be prepared.

Upon conclusion and successful completion of this FAT, a Certificate of Acceptance will be signed by Customer representative and Aviat Networks representative to certify that the equipment has been approved for delivery after all punch list items have been resolved.



▣ **PRODUCTS**

- a) ECLIPSE IRU 600
- b) ADTRAN PROCARE IP PHONE

▣ **REFERENCES**

- a) Instruction Manuals

▣ **TEST EQUIPMENT**

#	Description	Model Number*	Serial Number*	Calibration Due Date*
1	{PRIVATE }POWER METER (HP 331B or			
2	{PRIVATE }{PRIVATE }STD POWER HEAD			
3	{PRIVATE }HI POWER HEAD (HP811B or			
4	{PRIVATE }LOW POWER HEAD (HP831D or			
5	PATH ATTENUATORS			
6	ETHERNET TESTER (SUT 600B or equivalent)			
7	BENCHMETERS:			
8	Other:			

*To be filled during Factory Acceptance Test

□ **PROCEDURE**

1. VISUAL INSPECTION AND INVENTORY:

1.

1.1. Visual inspection

1.1.1. Verify that equipment is installed per Rack Profiles.

1.1.2. Verify labeling of racks

1.2. Mechanical Inspection

1.2.1. Check that the shelves are secure and free of defects or damages.

1.2.2. Check that all power wiring are properly secured and aligned.

1.2.3. Check that there are no broken, bent or misaligned connectors.

1.2.4. Check that there are no misaligned, dented or twisted shelves.

1.2.5. Check that there is no broken or damaged equipment (connectors, wiring, etc.)

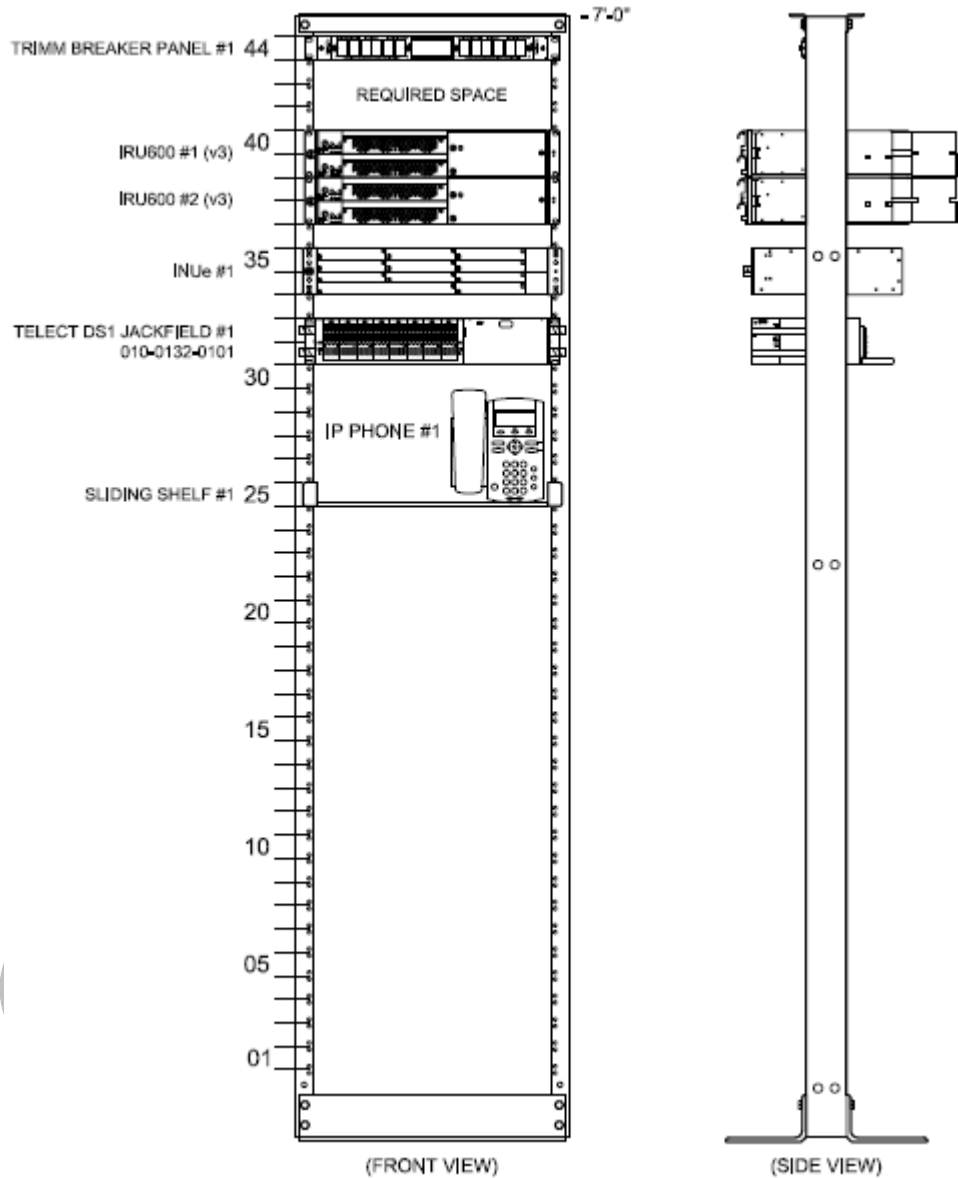
1.2.6. Check that all cabling and wiring are terminated and secured in place.

1.3. Inventory

1.3.1. Using bill of material list (Rack build report) inventory the hardware for completeness and accuracy.

RACK #	Site Name	Visual Inspection	Mechanical Inspection	Inventory
		(√)	(√)	(√)
A1	S-5			
A2	S-5			
B1	S-25			
C1	S-31			
D1	S-31			
E1	S-31			

SAMPLE RACK PROFILE:



COMMENTS:

INITIALS:

SYSTEMS INTG. TECH.

CUSTOMER REP.

SAMPLE

2. **VERIFY SOFTWARE VERSIONS:**{tc \I 2 " INVENTORY "}

- 2.1. Using Sales Order Specific documents, configuration/management tool and/or Provision NMS, check software versions.
- 2.2. Verify capacity license(s) and future licenses, if any.
- 2.3. Record.

SW Versions	
-------------	--

Part	Part Number	Description	(√)
Software License	EZE-08001	NODE SW LICENSE, 50 Mbps TOTAL RADIO PAYLOAD CAPACITY	
Software License	EZE-08002	NODE SW LICENSE, 100 Mbps TOTAL RADIO PAYLOAD CAPACITY	
Software License	EZE-08006	NODE SW LICENSE, 400 Mbps TOTAL RADIO PAYLOAD CAPACITY	
Software License	EZF-14	NCM LOOP SWITCH	

COMMENTS:

INITIALS:

SYSTEMS INTG. TECH.		CUSTOMER REP.	
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3. VERIFY TRANSMITTER AND RECEIVER FREQUENCIES:

1.

Using “Aviat Portal” or Provision NMS, verify that transmit and receive frequencies are programmed per requirements.

PASSED: **YES**____ **NO**____

COMMENTS: _____

INITIALS:	SYSTEMS INTG. TECH.		CUSTOMER REP.	

4. TRANSMIT POWER OUTPUT (TOR) {tc \12 "F. POWER AMP "}

- 4.1. Mute Transmitter.
- 4.2. Install a wave-guide to N-type adapter to the TOR wave-guide flange.
- 4.3. Connect calibrated high power head to adapter.
- 4.4. Unmute transmitter.
- 4.5. Measure/record Power Output at the TOR.
- 4.6. Record the "Portal" reading.
- 4.7. Mute Transmitter.
- 4.8. Disconnect calibrated high power head and remove N-type adapter.
- 4.9. Restore RF Connection.
- 4.10. Unmute the "Transmitter".

TEST EQUIPMENT: POWER METER, HIGH POWER HEAD

RESULTS:

COMMENTS: _____

INITIALS:				
	SYSTEMS INTG. TECH.		CUSTOMER REP.	

SAMPLE

5. RECEIVER THRESHOLD{tc \l 2 "K. PRELIMINARY THRESHOLD AND OVERLOAD CHECKS "}

- 5.1.** Connect path simulator between coordinating racks.
- 5.2.** Calibrate path simulator over the dynamic range and note the attenuator settings vs. Received Signal Level (RSL) at TOR.
- 5.3.** Fade the path until BER reading is 1×10^{-6} .
- 5.4.** Record the measured value.
- 5.5.** Repeat for other units under test.

TEST EQUIPMENT: BER TESTER, LOW POWER HEAD, PATH SIMULATOR

RESULTS:

COMMENTS:

INITIALS:

SYSTEMS INTG. TECH.		CUSTOMER REP.	
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6. END-TO-END CIRCUIT ASSIGNMENTS PER CHANNEL PLAN/SYSTEM DOC AND CONTINUITY AT ALL SITES.

- 6.1.** Verify programming of circuits per channel plan/system documents.
- 6.2.** Determine the termination points of the circuit.
- 6.3.** Connect one BER tester to one end of the circuit
- 6.4.** Connect another BER tester to the other end of the circuit.
- 6.5.** Verify that traffic runs error-free
- 6.6.** Repeat for the remaining

circuits. TEST EQUIPMENT:

BER Tester.

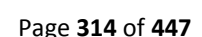
REQUIREMENT: Traffic continuity per channel plan.

Passed: Yes ☐ No ☐

COMMENTS: _____

INITIALS:	<div>SYSTEMS INTG. TECH.</div>	<div>CUSTOMER REP.</div>
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- 7.1. Verify setup and configuration.
- 7.2. Connect T1 test sets between two nodes per traffic plan.
- 7.3. Reset the test sets and verify error free traffic.
- 7.4. Restore the RF path.
- 7.5. Reset test sets and verify error free traffic.
- 7.6. Record the results.



8. LONG TERM BER TEST

- 8.1. Restore all connections.
- 8.2. Set RF paths to nominal level (about -45 dBm TOR RSL).
- 8.3. Connect external BER test sets to circuit(s) under test per traffic plan.
- 8.4. Also, set PORTAL BER counter for the circuit(s) under test.
- 8.5. Run the test for at least 12 HRS.

TEST EQUIPMENT: INTERNAL

BER TESTER

CIRCUIT #	Date/Time

COMMENTS:

INITIALS:

SYSTEMS INTG. TECH.

CUSTOMER REP.

9. LONG TERM BER TEST RESULT

- 9.1. Check BER result for bit error(s) and bit-error-rate. There should not be any other error(s), i.e. SL (sync loss), FL (Frame Loss).
- 9.2. Record results

REQUIREMENT: $N \times 10E-12$ where "N" is equal to the number of radio hops.

(For a single radio hop for 12 hours 28DS1s connected in tandem, there should be no more than 3 errors for a BER of $10E-12$).

RESULT:

CIRCUIT #	DURATION	ERRORS	BER	Date/Time

Passed: Yes _____ No _____

COMMENTS:

INITIALS:

SYSTEMS INTG. TECH.

CUSTOMER REP.

10. PROTECTION SWITCHING

- 10.1. Ensure that card has no standing alarms.
- 10.2. Prior to commencing redundancy switching, ensure that card / equipment bootup process is complete.
- 10.3. Verify card / equipment bootup completion using Aviat Portal.
- 10.4. While monitoring traffic, use Portal to switch equipment to off-line card / equipment.
- 10.5. Observe switching occurs.
- 10.6. From the Tx point of view, switching is not hitless; Rx side switching is hitless.
- 10.7. Reset BER tester.
- 10.8. Verify that traffic runs error-free.
- 10.9. Create alarms on on-line card / equipment or remove on-line card (Primary) / equipment.
- 10.10. Observe that switching occurs to off-line (Secondary) card / equipment.
- 10.11. Switching due to card removal is not hitless.
- 10.12. Reset BER tester.
- 10.13. Verify that traffic runs error-free.
- 10.14. Prior to inserting Primary card / equipment back, lock traffic to Secondary card / equipment.
- 10.15. Insert Primary unit back.
- 10.16. Ensure that traffic remains locked to Secondary card / equipment until Primary equipment is installed and card / equipment bootup is complete.
- 10.17. Remove lock to Secondary card / equipment (auto mode). TEST EQUIPMENT. BER TESTER.

REQUIREMENT: Traffic continuity as switching occurs.

Results:

CK #	Site Name	Radio	(√)				
			DC POWER	TX	RX	RAC	DAC

Customer will randomly select several radios during the FAT. Aviat technician will perform the test and populate the table.

COMMENTS:

INITIALS:

SYSTEMS INTG. TECH.

CUSTOMER REP.

11. DAC GE CARD – ETHERNET THROUGHPUT TESTING

11.1. This test would attempt to find the highest rate at which the DUT can forward frames without a loss.

It uses simple algorithm to choose rates between the previous rate and a new rate; if a port drops frames, it throttles to a lower rate, and if a port doesn't drop any frame, then it throttles to a higher frame. For throughput test, the following parameters will be used:

9.2.1. Initial rate of 100% of maximum DUT Data rate

9.2.2. Maximum rate of 100% of maximum DUT Data rate

9.2.3. Minimum rate of 50% of maximum DUT Data rate

9.3. Run test for 64 to 1518 packet sizes

9.4. Record results

Frame size used (byte)	Typical Expected Throughput	Passed Rate	Packets/Sec
64	≥ 92%		
1518	≥ 92%		
64	≥ 92%		
1518	≥ 92%		

PASS if the throughput for each packet size is consistent with the allocated bandwidth, FAIL otherwise (*There is no PASS / FAIL criterion for RFC2544*).

9.5. For protected DAC GEv3 traffic, simulate DAC GEv3 DPP cable failure:

9.5.1. Connect the test set to the primary cards under the test.

9.5.2. While the test is running, remove the DPP cable to primary card(s)

9.5.3. Verify traffic continuity through secondary DAC GEv3 cards.

9.6. Record results

TEST EQUIPMENT: ETHERNET TESTER

REQUIREMENT: Typical Expected Throughput is ≥ 92% of allocated bandwidth.

Passed: Yes ☐ No ☐

COMMENTS:

INITIALS:

SYSTEMS INTG. TECH.

CUSTOMER REP.

13. ADTRAN PROCARE IP PHONE

- 13.1.** Verify setup and configuration.
- 13.2.** Connect Ip phones to free NMS ports on nodes.
- 13.3.** Connect IP phones per as built documentation
- 13.4.** Randomly select any two phones for test purpose.

SAMPLE DIAGRAM:

SAMPLE

RACK #	Site Name	IP Phone Address	Adran Netvanta IP Address	IP Phone/Adran Netvanta Functionality
				(√)
A1		192.168.1.1 /24	VoIP: 192.168.1.254 /24	
			MGMNT: 172.16.1.5 /24	
B1		192.168.1.17 /24		
C1		192.168.1.33 /24		
D1		192.168.1.49 /24		
E1		192.168.1.57 /24		
F1		192.168.1.65 /24		
G1		172.168.1.73 /24		
H1		192.168.1.81 /24		
J1		192.168.1.89 /24		
K1		192.168.1.97 /24		

COMMENTS:

INITIALS:

SYSTEMS INTG. TECH.	
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CUSTOMER REP.	
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**16.1. Ethernet Ring Protection (ERP, ITU-T G8032)
verification.**

16.1.1. Measure ERP ring switching time.

16.1.2. Log in to switches and verify that “NodeState” is in “Idle”.

Show Ethernet ring g8032 brief

16.1.3. Configure test set for packet loss test.

16.1.4. Send 1000 packets per second.

16.1.5. Start packet loss test.

16.1.6. Simulate RF link fading using the attenuator (BER 10^{-3} or worse).

16.1.7. Verify switching. “NodeState” should be in “Protection”.

Show Ethernet ring g8032 brief.

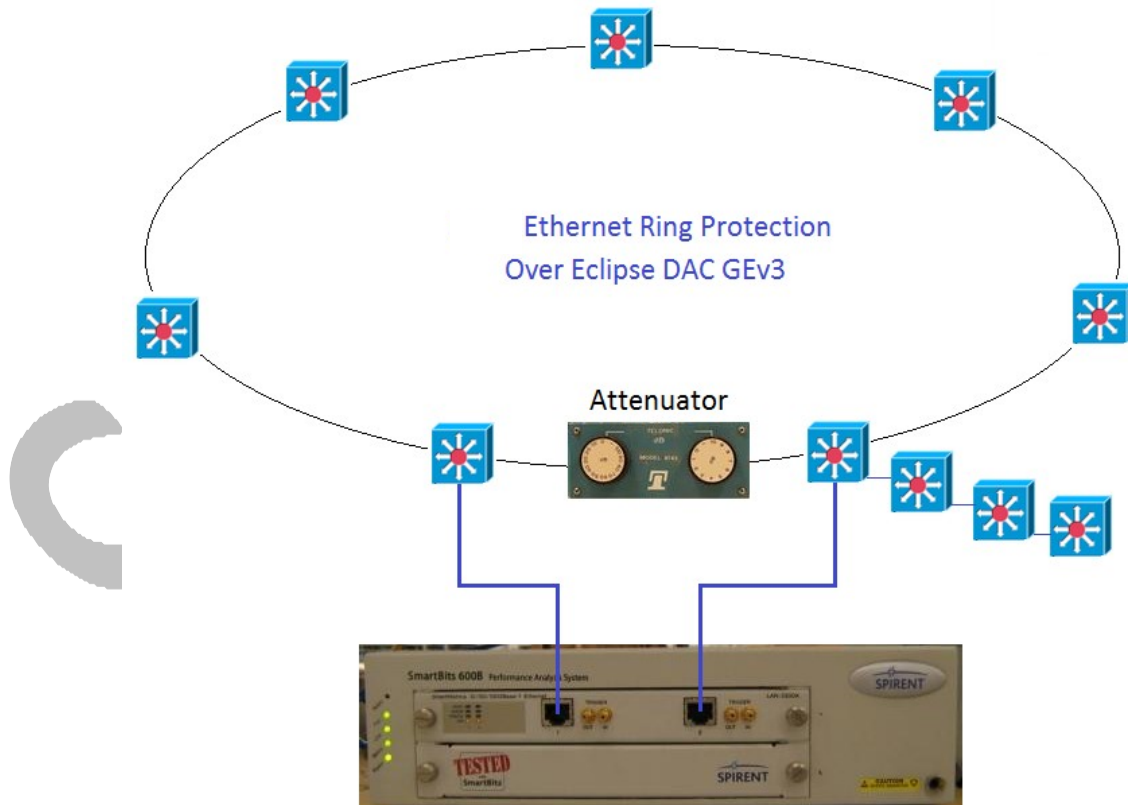
16.1.8. Calculate the number of lost packets in order to find out switching time.

Each packet loss represents 1 ms.

16.1.9. Record the result.

16.1.10. Measure ERP revertive switching time.

16.1.11. Record the result.



TEST #	ERP Switching (ms)	ERP Revertive Switching (ms)	Comments	Pass/Fail
17.4				
17.4				
17.4				

16.2. Ethernet Spur 1+1 Protection Switching on Spur sites.

16.2.1. Measure Protected DAC GEv3 1+1 switching time.

16.2.2. Configure test set for packet loss test.

16.2.3. Send 1000 packets per second.

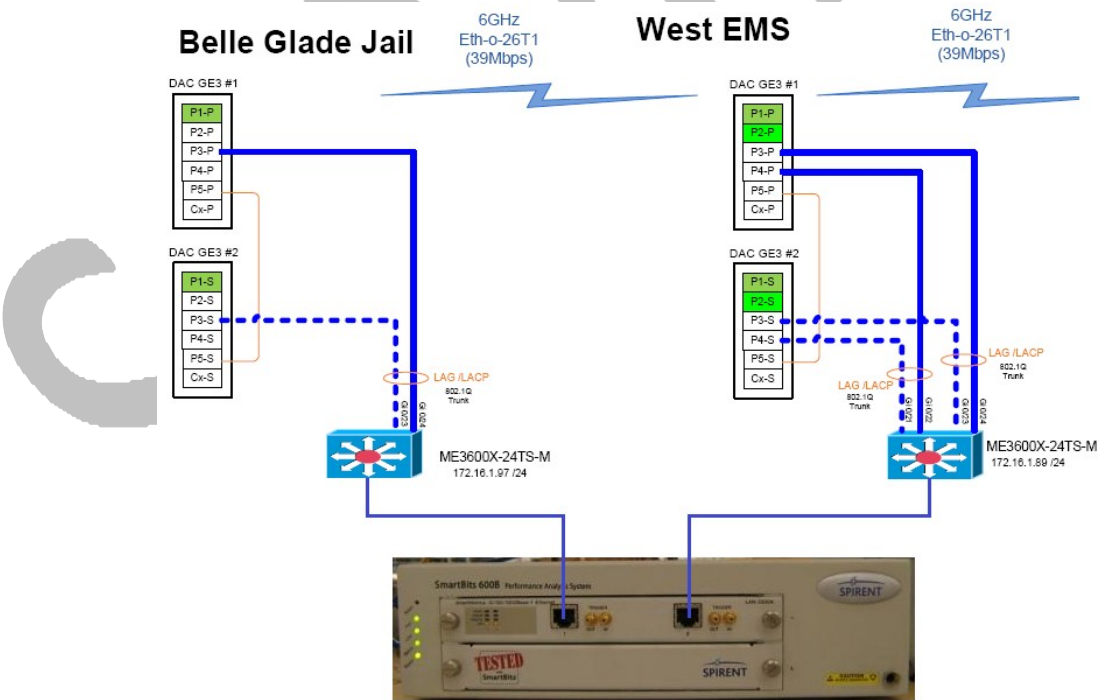
16.2.4. Start packet loss test.

16.2.5. Pull cable.

16.2.6. Calculate the number of lost packets in order to find out switching time.

Each packet loss represents 1 ms.

16.2.7. Record 1+1 switching time.



TEST #	1+1 Switching (ms)	Comments	Pass/Fail
17.5			
17.5			

16.3. VLANs / 802.1Q

16.3.1. Test and verify end-to-end connectivity for traffic in the same VLAN.

TEST #	VLAN ID	Comments	Pass/Fail
17.6			
17.6			
17.6			

16.4. Ethernet Network Performance Testing

16.4.1. Perform throughput testing on Ring and Linear Spur without congestion.

16.4.2. Perform latency testing on Ring and Linear Spur without congestion.

TEST #	Ring (ms)	Linear Spur (ms)	Comments	Pass/Fail
17.7.1				

TEST #	Latency Ring (ms)	Latency Linear Spur (ms)	Comments	Pass/Fail
17.7.2				

16.5. QoS

16.5.1. Baseline without congestion: Verify the bandwidth allocation and latency per QoS plan for the Strict Priority Queue and data queues using DWRR queues and CBWFQ by sending multiple test flows with the following loads within the profiles:

Q7: Strict Priority: Policed to 20%
 Q5: Strict Priority: Policed to 30%
 Q3: Guaranteed 50% of remaining BW
 Q2: Guaranteed 40% of remaining BW
 Q0: Remaining BW

TEST #	Bandwidth (mbps)	Latency (ms)	Comments	Pass/Fail
17.7.8				
17.7.8				
17.7.8				
17.7.8				
17.7.8				

16.5.2. Under Congestion: Verify that Higher Priority Traffic can still pass through while Lower Priority traffic drops.

TEST #	Comments	Pass/Fail
17.8.2		

16.5.3. Verify that when congestion occurs, Cisco ERP still can reconverge and switch the traffic to the opposite side of the Ring.

TEST #	Comments	Pass/Fail
17.8.3		

16.5.4. Verify that when Real-Time Traffic is under congestion, it can still pass through without packet drop while the other queues have packet loss. Verify that the quality of the VoIP calls is still good.

TEST #	Comments	Pass/Fail
17.8.4		

16.5.5. Verify that when Real-Time & NMS traffic is under congestion, they can still pass through without packet loss while other lower priority queues having packet loss. Verify that Provision servers can still reach remote devices for management.

TEST #	Comments	Pass/Fail
17.8.5		

16.5.6. Overload the network at 120% with lower priority traffic and sample test Latency/Jitter of Real- Time Traffic under congestion.

TEST #	Jitter (ms)	Latency (ms)	Comments	Pass/Fail
17.7.8				

INITIALS:

SYSTEMS INTG. TECH.

CUSTOMER REP.

Signoff Certificate

By their signatures below, the following witnesses certify they have observed the system Acceptance Test Procedures.

Signatures

WITNESS:

Date: _____

Please Print Name: _____

Initials:

Please Print Title: _____

WITNESS:

Date: _____

Please Print Name: _____

Initials:

Please Print Title: _____

WITNESS:

Date: _____

Please Print Name: _____

Initials:

Please Print Title: _____

7.8 Preliminary Cutover Plan

In order to transition Palm Beach County from the existing radio system to the proposed new ASTRO 25 digital system, Palm Beach County and Motorola will need to develop a system migration and cutover plan. This plan, when executed precisely, will allow the County's users to transition as smoothly as possible and without interruption onto the new system.

It is not the purpose of this document to present this final plan, but rather to identify the key components that will be transitioned, to highlight the challenges associated with those transitions, and to present recommended directions and solutions for each one of the key components.

The final detailed plan will be developed as a joint collaboration between Motorola, Palm Beach County, the County's technical team, and the individual system users or their representatives.

The Cutover Plan will be divided in three phases:

- Phase I – Pre-Cutover Preparation.
- Phase II – Cutover Execution.
- Phase III – Post Cutover.

7.8.1 Phase I

The pre-cutover phase is the most important phase. This is where all the planning of the detailed cutover plan occurs for a successful cutover execution. The following outline establishes the starting point for cutover planning to aid Palm Beach County and Motorola in the crafting of a viable cutover strategy. Careful up-front cutover planning will require the County, and Motorola to work closely with end users to assure minimum disruption.

Upon conclusion of the Contract Design Review phase of the project, the County, and Motorola project team will commence activities to transform the following "Preliminary Cutover Plan Outline" into a comprehensive and detailed Cutover Plan complete with a timeline of events that will guide the collective actions leading up to, during, and following the actual transition from the existing system to the new ASTRO 25 system.

7.8.1.1 Cutover Steps- Overview

The major steps of a migration include:

1. Build subscriber database for new ASTRO 25 DSR Master site.
2. Replace Gold Elite consoles with MCC 7500 and interface to existing 7.13 Master.
3. Installation of the ASTRO 25 DSR Master site.
4. Installation of microwave system.
5. Installation of ASR system.
6. Replace antennas (as needed), combiner and lines.
7. Installation of P25 remote sites.
8. Installation of conventional mutual aid system.
9. Installation of Network Management Clients.
10. Configure and optimize the P25 System.



11. Perform CATP and FATP.
12. Program subscribers and migrate users to the P25 system.

7.8.1.2 Preliminary Cutover Plan Outline

Below is a preliminary high level cutover plan, which consists of the following steps:

Step 1:

Replace all existing Gold Elite consoles with MCC 7500 consoles and interface to the existing 7.13 Master Site located at S-5. There will be some existing CEBs supporting logging that will be kept active until logging can be transition to the AIS demarcation point. The MCC 7500 console will be programmed using similar Gold Elite console screen configuration template. The MCC 7500 console will use existing Constellation microwave to interface to the master site.

Step 2:

Install 7.16 Main Master Site with Prime site equipment at S-15 and backup Master Site with Prime site equipment at S-25.

Step 3:

The existing microwave system consists of three rings (west, north and south rings) and 2 spurs.

The microwave rings will be cutover in the following order. Please note because this is a ring configuration there should be no system impact:

Replace the existing west microwave ring one hop at the time.

Replace the existing north microwave ring one hop at the time.

Replace the south microwave ring one hop at a time.

For the replacement of the existing two microwave spurs, there needs to be careful planning to minimize the system impact to S-4 and S-20. The recommendation is to obtain temporary leased T1 circuits to assist with the microwave cutover of these two microwave spurs.

Install new Aviat microwave spur between S-33 and S-5.

Step 4:

Install an 8-channel 700 MHz ASR and two 700 MHz mutual aid channels equipment at S-33.

Connect the ASR to the 7.16 Master site via microwave.

There is no system impact to implement the 700 MHz ASR.

Step 5:

Replace all existing combiners at all sites.



Replace all existing transmit and receive transmission lines at all site with the exception of S-25, S-31, and S-32. For S-25, S-31, and S-32, the replacement of the antennas and lines will be planned to minimize any system impact to the system.

Replace all existing GPS Frequency Standard with new ones at all remote radio sites and S-5.

Step 6:

Install new P25 remote site equipment at the existing sites.

Install conventional mutual aid system at the following sites: S-3, S-7, S-8, S-11, S-25, S-22, and S-31.

Step 7:

Prior to implementing this step, AIS Logging will need to be interfaced to logging recorder.

Activate Main P25 Master site with SmartX.

The 4 existing T1s supporting SmartX at S-5 will be connected to S-15 via microwave.

All SmartZone voice traffic will now be processed by the 7.16 Main Master Site at S-15.

Step 8:

Bring up 4 Channels at 10 sites on P25 and optimize system.

The 6 new Network Management Terminals will be cutover.

Replace antennas and lines at S-25, S-31, and S-32.

CATP and FATP can commence. Once the CATP and FATP are completed then the subscriber units can be migrated to the new P25 system.

Step 9:

Prior to migrating subscriber to new P25 System, all subscribers will need to be programmed to accommodate both legacy and P25 systems.

Activate 8 more P25 channel for a total of 12 and slowly migrate subscriber users to the P25 system; continue to increase the number of P25 channel until we obtain the 24 total P25 channels active.

Step 10:

Upgrade the MCC5500 wireless console to P25.

Step 11:

Cutover conventional mutual aid system.

Step 12:

Interface ISSI 8000 to other systems with ISSI capabilities.

Below is a detailed list of prerequisites, constraints, and assumptions that will need to be taken into consideration during this cutover planning phase.

7.8.1.3 Identification of Prerequisites/Constraints/Assumptions

Palm Beach County - MCC 7500 Dispatch Console Readiness:

1. Motorola will install, interface, optimize and test the following prior to cutover.
 - A. MCC 7500 Dispatch Consoles 911 telephone headset interfaces.
 - B. Network Manager and Fault Manager client's at the specified County locations.
2. Migration to New ASTRO 25 system – A migration plan as to which County agencies go onto the new system first will be developed. Since the system is designed for portable coverage, users can begin transitioning over to the new system with portable radios.
3. FCC Licensing:
 - A. 800 MHz – The P25 System design will reuse most of the existing antenna network so minimal licensing will be needed. However, Per the RFP, Motorola will provide the FRIP analysis and assist with the FCC submittals to get at a minimum Station Temporary Authorization (STA) so that the County can conduct acceptance testing and start operating. Motorola has also included services to obtain the FCC licensing for the 800 MHz System.
4. Acceptance/Reliability/Redundancy Testing:
 - A. Functional Testing – All Field Functional Testing should be performed and approved by Palm Beach County.
 - B. Coverage Testing – Coverage test should be completed and accepted by Palm Beach County prior to the cutover date.
5. Fleetmapping:
 - A. Subscribers – All P25 subscribers capable of operating in the new ASTRO 25 system should have been programmed by Motorola with the new ASTRO 25 code plug information tested and verified by the County and Motorola implementation team.
 - B. Dispatch Consoles – All new proposed MCC 7500 dispatch consoles should be tested and all screen layouts should be approved by the County prior to cutover.
 - C. Interoperability – All interoperability analog interfaces should have been tested by the County and Motorola implementation teams.
 - D. Database Provisioning/Archiving – System databases should have been loaded into the new ASTRO 25 system, tested and verified by the County and Motorola implementation teams.
6. Training – All required training should have been performed prior to cutover.

7.8.1.4 Detailed Timeline/Sequence of Events

1. Inter-System Scheduling Relationships (Radio/911/Logging) – A detailed schedule of events for the cutover will be developed jointly with the County and Motorola. This schedule will include details about other systems essential for the operations of the 911 Dispatch Center like E911/logging recorder.
2. Fallback Strategies/Contingency Plans – A detailed fallback plan will be identified by the County, and Motorola implementation team, developed jointly with the County and Motorola. This fallback plan will clearly identify the failures, causes and /or events that will activate the fallback plan, the backup subsystems to use and who in the County will have the ultimate responsibility to activate the fallback plan.
3. Dates/Timeframes to Avoid (Holidays, etc.) – The detailed timeline and scheduled will avoid holidays or special events occurring in the County that impact agencies operations.



It is desired to implement the cutover at a time and date of low traffic in the system to minimize the impact on the users.

4. Personnel/Staffing Requirements (County and Vendors) – The County will coordinate the staffing required for the dates of cutover as well as the different vendors required to be on site during the cutover. Motorola team will define the staffing required for the cutover at different sites and the dispatch center prior to the cutover.

7.8.1.5 Post-Cutover Strategy

Short-Term and Long-Term Support Requirements – Once the transition to the new system is completed the County and Motorola will determine how long the legacy system should be kept in operations to support any agency or radio users that have not made the transition to the new system after the cutover.

7.8.2 Phase II

Phase II of the plan is where the execution of the pre-defined plan in Phase I takes place. A high-level view of the cutover is being outlined below in response to Palm Beach County RFP requirements.

7.8.2.1 Trunking Infrastructure

Motorola's response calls for a complete implementation to the new system. This will include complete installation of the new ASTRO 25 equipment at the proposed sites.

7.8.2.2 Agency Talkgroup Transition Approach

The County and Motorola will collaborate on identifying groups of radios ("fleets" or "user groups") that will be transitioned together onto the new system and an appropriate timetable for each group transition. Radios in each user group will be identified and a determination will be made for each radio as to the appropriate procedure to transition it.

Once all groups have been identified and each radio classified, it will be necessary for the project team to choose the order, set a transition schedule, and create the detailed procedure for each group transition. Motorola will do the bulk of the work for this process but will require regular meetings with the Palm Beach County technical authorities to refine and approve each step.

7.8.3 Phase III

After the successful execution of the cutover plan, post-cutover activities will commence to remove the components that are no longer needed for the operations of the new system. The removal of these components will be executed with no disruption to operations of the new ASTRO 25 system. These components include legacy consoles and backroom equipment racks.

Removal of any legacy system equipment will be at the approval of Palm Beach County.



7.8.4 Conclusion

As reflected above, a smooth, if somewhat intricate, transition from the existing system to the new system can be achieved. The greatest challenge will be getting the mobile installations completed as quickly as possible. There will be many other challenges to overcome as the transition plan is formulated, developed and executed. Palm Beach County, and Motorola project's team has the experience to meet these challenges.



7.9 Detailed Training Plan

7.9.1 Overview

Motorola Solutions understands that the successful implementation and use of your communications system depends on effective training. We have developed a training proposal for Palm Beach County to ensure a comprehensive understanding of your proposed system and all user equipment. We are leveraging over 85 years of training experience working with customers just like you to provide recommendations for your consideration. The training proposal detailed in the following pages incorporates customer feedback coupled with a best practices systematic approach to produce effective course delivery and content.



Our commitment to Palm Beach County is to provide unsurpassed services that ensure the equipment operates efficiently for the life of the system, and in doing so, directly train your personnel to acquire a level of knowledge to utilize the system at its maximum potential.

Palm Beach County personnel will gain in-depth understanding of the power of your new system through education and proficient daily use. Our high-quality training focuses attention on student needs. Training is complemented by our detailed documentation and available continuing education program.

We will collaborate with Palm Beach County to develop a final customized training plan that fits your needs and assures that System Administrators, Maintenance Technicians and End Users are skilled in using your new system.

7.9.2 Training Approach

Our training solution delivers a combination of online training and field based instructor led training at Palm Beach County locations using the operational equipment and classrooms. Motorola Solutions will employ knowledgeable and experienced instructors, well-designed courseware and integrated lab activities.

Training is based upon several key criteria:

- Course design is driven by an analysis of student needs and focuses on how-to rather than theory.
- Learning objectives are based upon what students need to accomplish on the job and focus on specific applications or components.



- Hands-on lab opportunities using Palm Beach County specific job aids are incorporated into training to maximize the transfer of skills and the retention/reuse of information.

Our instructors bring invaluable experience and first-hand knowledge of public safety systems into their training approach. This experience and knowledge provides them a better understanding of and insight into the practical aspects of the role of Palm Beach County Managers, Technicians and End Users. Each has a proven ability to communicate with novice as well as expert personnel.

7.9.3 Courses Proposed

Motorola Solutions has identified the following course(s) that are necessary to achieve the training goals for Palm Beach County. Course description files for the recommended courses are provided in the matrix below and/or in the training appendix. Class delivery for instructor-led courses in the field will be tailored for your system and features.

Specifically, our proposed training plan addresses the following categories as identified in your request for proposal:

- System Administrators.
- Console Operators and Supervisors.
- Maintenance Technicians.

It is recommended that students bring their laptop computers for all System Administrator and Technician classes.

7.9.3.1 Planning Phase – Training Plan

Course	Target Audience	No. of Sessions	Duration	Location	Date	No. of Attendees
ASTRO 25 Fleetmapping Workshop (Instructor-led)	System Planners; Administrators and Technicians	1	5 days	FL	After Contract Award during the Planning Phase	Up to 12
Course Synopsis: This workshop addresses topics necessary for the effective planning and mapping of an ASTRO 25 IV&D radio system. During this course, the participants will learn about ASTRO 25 features, capabilities, and restrictions in order to effectively plan for a new or upgraded ASTRO 25 system.						

7.9.3.2 Radio Manager Training Plan

Course	Target Audience	No. of Sessions	Duration	Location	Date	No. of Attendees
ASTRO 25 IV&D System Applied Networking (Instructor-led)	System Administrators & Technicians	1	5 days	FL	Prior to remaining classes	Up to 12



Course	Target Audience	No. of Sessions	Duration	Location	Date	No. of Attendees
<p>Course Synopsis:</p> <p>This course provides the participant with the necessary networking information required for understanding the Network Transport subsystem components installed in an ASTRO 25 IV&D communications system. The course includes familiarization with basic networking concepts and the networking components deployed throughout the system.</p>						
ASTRO 25 IV&D with M Core System Overview (Self-paced; On-line) Prerequisite #1	System Administrators & Technicians	NA	4 hours	Self-Paced Online	Prior to Prerequisite 2	Up to 12
<p>Course Synopsis:</p> <p>The ASTRO® 25 IV&D Trunking with M Core System Overview is a self-paced course. It is the starting point for all ASTRO 25 IV&D Trunking with M Core systems. It provides a high-level description of the system's call flow capabilities, components, features and benefits. Participants are required to complete this course with a passing score on the corresponding test before taking other classes.</p>						
ASTRO 25 IV&D Introduction to Radio System Administration (Self-paced; On-line) Prerequisite #2	System Administrators & Technicians	1	10 hours	Self-Paced Online	Prior to Radio System Administrator & other classes below	Up to 12
<p>Course Synopsis:</p> <p>This virtual, interactive course provides a high-level overview of the Motorola Radio System Management applications through recorded demonstrations of common system tasks.</p>						
ASTRO 25 Domain Controller Administration (Instructor-led)	System Administrators & Technicians	1	3 days	FL	Prior to Managing the System	Up to 12
<p>Course Synopsis:</p> <p>This workshop covers the administrator and management functions in the ASTRO 25 Domain Controller and how these functions affect both users and computers in the ASTRO 25 system. The learning activities in this course focus on how to use the Domain Controllers to authenticate, administer, and authorize users and devices in the ASTRO 25 System. Group Policies and Organizational Units, RADIUS, and DNS structure will be addressed during this course.</p>						
ASTRO 25 IV&D Radio System Administrator Workshop (Instructor-led)	System Administrators	1	5 days	FL	Prior to Managing the System	Up to 12
<p>Course Synopsis:</p> <p>This workshop covers the administrator functions for an ASTRO 25 Integrated Voice and Data (IV&D) System. Learning activities in this course focus on how to use the different ASTRO 25 IV&D System Management applications. Participants will have an opportunity to discuss how to structure their organization and personnel for optimal ASTRO 25 IV&D system use.</p>						
ASTRO Secure Communications Workshop (OTAR/KMF) (Instructor-led)	System Administrators	1	5 days	FL	Prior to Managing the System	Up to 12
<p>Course Synopsis:</p> <p>This workshop describes planning, installation, configuration, operations, and troubleshooting of Secure Communications within the ASTRO 25 IV&D System.</p>						
ASTRO 25 ISSI 8000 / CSSI 8000 FEATURE OVERVIEW (Self-paced; On-line)	System Administrators	NA	4 hours	Self-Paced Online	Prior to Managing the System	Up to 12



Course	Target Audience	No. of Sessions	Duration	Location	Date	No. of Attendees
<p>Course Synopsis:</p> <p>The ISSI 8000 / CSSI 8000 Feature Overview self-paced course describes the optional Inter-RF Subsystem Interface available in an ASTRO 25 IV&D System. It presents a description of the feature, its benefits and components, call processing scenarios, and an overview of the installation process.</p>						

7.9.3.3 Console Operator & Admin Training Plan

Course	Target Audience	No. of Sessions	Duration	Location	Date	No. of Attendees
MCC 7500 Console Operator and Admin Train-the-Trainers 5 Training Consoles (Instructor Led)	Dispatch Supervisors	2 (8 hour sessions)	2 days	FL	Prior to cutover	Up to 16 (8 per)
<p>Operator Course Synopsis:</p> <p>This course provides participants with an introduction to the dispatch console, its basic operation and tailored job aids which will be available for assistance in operation. Through facilitation and hands-on activities, the user learns how to perform common tasks associated with the console operation.</p> <p>Admin Course Synopsis:</p> <p>This course provides participants with the knowledge and skills to manage and utilize the MCC 7500 console administrator functions. Through facilitation and hands-on activities, the participant learns how to customize the console screens.</p> <p>Note: First half of the day is the operator class. The second half of the day is the admin class. How to utilize the Interactive End User Tool Kit is also covered in the second half of the day</p>						
MCC 7500 Console Operator 5 Training Consoles (Instructor Led)	Console Operators	6 (4 hour sessions)	3 days	FL	Prior to cutover	Up to 60 (10 per)
<p>Course Synopsis:</p> <p>This course provides participants with an introduction to the dispatch console, its basic operation and tailored job aids which will be available for assistance in operation. Through facilitation and hands-on activities, the user learns how to perform common tasks associated with the console operation.</p>						

7.9.3.4 Maintenance Technician Training Plan

Course	Target Audience	No. of Sessions	Duration	Location	Date	No. of Attendees
ASTRO 25 IV&D M Core Workshop (Instructor-led)	M Core Master Site Technicians	1	5 days	FL	Prior to maintaining	Up to 12
<p>Course Synopsis:</p> <p>The ASTRO 25 IV&D with M Core course teaches advanced troubleshooting skills and best practices for the Trunked Large Systems. The course also focuses on gathering and analyzing system information to implement appropriate action(s) that return a system to full operational status.</p>						
ASTRO 25 IV&D IP Simulcast with GTR 8000 Repeater Site Workshop (Instructor-led)	Site Technicians	1	5 days	FL	Prior to maintaining	Up to 12



Course	Target Audience	No. of Sessions	Duration	Location	Date	No. of Attendees
<p>Simulcast Course Synopsis:</p> <p>The ASTRO 25 IV&D IP Based Digital Simulcast workshop provides an understanding of the components that comprise the ASTRO 25 IV&D IP Simulcast subsystem, and how they operate in conjunction with each other. The workshop also explains the tools and methods available for troubleshooting components within the IP Based Simulcast subsystem.</p> <p>GTR8000 Course Synopsis:</p> <p>This workshop describes the components in the ASTRO 25 IV&D System Repeater Site with GTR 8000 expandable site subsystem. This course also presents how the GTR 8000 expandable site subsystem operates and explains the tools and methods available for troubleshooting components within the subsystem.</p>						
MCC 7000 Series Dispatch Consoles Overview (Self-paced; On-line) Prerequisite	Console Technicians	NA	1 hour	Self-Paced Online	Prior to console workshop	Up to 12
<p>Course Synopsis:</p> <p>This course provides an overview of the MCC 7000 series of Dispatch Consoles. It includes a description of the features and illustrations of subsystem architecture options. Descriptions of subsystem components and illustrations of signal flow and call processing are also included.</p>						
MCC 7000 Series Dispatch Consoles Workshop (Instructor-led)	Console Technicians	1	4 days	FL	Prior to maintaining	Up to 12
<p>Course Synopsis:</p> <p>This course familiarizes participants with the installation, configuration, management and repair of MCC 7000 Series IP dispatch consoles. It also covers Archiving Interface Servers, AUX I/O servers, and Conventional Channel Gateways. The focus is on a detailed discussion of console hardware and hands-on activities with the installation and configuration of the MCC 7000 Series IP dispatch consoles.</p>						



7.9.4 Course Descriptions

7.9.4.1 ASTRO 25 Fleetmapping Workshop

Duration:

5 days

Delivery Method:

ILT – Instructor-led training

Target Audience:

Pre-Sale System Owners, Planners, Administrators, and Technicians

Course Synopsis:

This workshop addresses topics necessary for the effective planning and mapping of an ASTRO 25 IV&D radio system. During this course, the participants will learn about ASTRO 25 features, capabilities, and restrictions in order to effectively plan for a new or upgraded ASTRO 25 system.

Prerequisite:

None

Course Objectives:

After completing the course, the participant will be able to:

- Understand the methodologies used to configure radio users and groups with the goal of optimizing system resources.
- Enable participants to knowledgeably assist with fleetmapping decisions.
- Perform the basic planning requirements and complete a simple fleetmap information template.
- Create a sample fleetmap based on sample operational requirement information.

7.9.4.2 ASTRO 25 Systems Applied Networking

NWT003

Duration:

5 days

Delivery Method:

ILT - Instructor-led Training

Target Audience:

Technical system managers, technicians, and engineers



Course Synopsis:

This course provides the participant with the necessary networking information required for understanding the Network Transport subsystem components installed in an ASTRO 25 IV&D communications system. The course includes familiarization with basic networking concepts and the networking components deployed throughout the system.

Prerequisites:

None

Learning Outcome:

After completing this course, the participant will be able to:

- Understand basic networking concepts.
- Describe the various Transport Network Subsystem components.
- Define the LAN topologies for each system.
- Define the WAN topologies for each system.
- Identify the expanse of Network Management across each system.
- Discuss HP switch and Motorola Series router configurations.
- Describe and perform the backup/restore procedures for the HP switch and Motorola Series routers in the ASTRO 25 system.

Course Modules:

Module 1: Basic Networking Concepts

- Terminology and acronyms
- LANS and WANS
- Basic protocols
- Network troubleshooting commands

Module 2: ASTRO 25 Network Transport Subsystem

- Call Processing
 - Block diagram description of how a call travels through the system
 - Identification and isolation of the network components
- Network Components
- HP switches - description and location in the network
 - Menu-driven configuration
 - Web-based configuration
- Cooperative WAN Routing—description and location in the network
- Motorola Series Routers—description and location in the network
 - Command line interface configuration
 - Menu-driven configuration
 - Web-based configuration
- Router Manager - location and application identification

Module 3: Network Concepts

- Identify the LAN portion(s) of the network



- Identify the LAN Protocols and describe where they are in the network
- Identify the WAN portion(s) of the network
- Identify the WAN protocols and describe where they are present in the network

Module 4: Hands-on practice

- Backup and restore HP switch configurations
- Backup and restore Motorola Series router configurations
- Create router boot configuration file
- Flash routers with new operating system

7.9.4.3 ASTRO® 25 IV&D with M Core System Overview

ACS714200

Duration:

4 hours

Delivery Method:

OLT – Online training

Target Audience:

System Managers, Technical System Managers, and System Technicians

Course Synopsis:

The ASTRO® 25 IV&D Trunking with M Core System Overview is a self-paced course. It is the starting point for all ASTRO 25 IV&D Trunking with M Core systems. It provides a high-level description of the system's call flow capabilities, components, features and benefits. Participants are required to complete this course with a passing score on the corresponding test before taking other classes.

Prerequisite:

Completion of the following courses or equivalent knowledge:

- Bridging the Knowledge Gap for ASTRO 25 (ACT100 or ACT101).
- Networking Essentials in Communication Equipment (NST762).
- Advanced Networking in Motorola Communications Equipment (NWT003).

Course Objectives:

After completing the course, the participant will be able to:

- List and describe the ASTRO 25 IV&D Trunking with M Core system features and capabilities.
- Describe the ASTRO 25 with M Core system sites and their components.
- Describe the paths used for control, voice, and data in an ASTRO 25 IV&D Trunking with M Core system.



- List the servers and databases used in an ASTRO 25 IV&D Trunking with M Core system.
- Describe voice and data signal flows and mobility management.
- Utilize the troubleshooting tools to diagnose a fault and restore the Large System Core to the level of the Motorola-supported service strategy.

Course Modules:

Module 1: System Architecture

- M-1 Core Architecture
- M-2 Core Architecture
- M-3 Core Architecture
- Common Server Architecture
- Scalability
- Module 1 Summary
- Module 1 Review Quiz

Module 2: System Features and Options

- Channel Partitioning
- Other Band Trunking
- Dynamic Dual Mode
- Enhanced Data Service
- Telephone Interconnect
- Digital Mutual Aid
- SmartX Site Converter
- ISSI.1 Network Gateway
- ISSI 8000 / CSSI 8000
- Dynamic System Resilience
- High Availability Data
- Radio Authentication
- Module 2 Summary
- Module 2 Review Quiz

Module 3: Zone Core Components

- Direct Attached Storage Device
- Domain Controllers
- Zone Controller
- CSMS
- PDG
- GGSN
- Network Management Components
- Network Transport Components
- Network Subnets
- Servers and Databases
- Module 3 Summary
- Module 3 Review Quiz



Module 4: Remote Sites

- GTR 8000 Expandable Site Hardware
- Repeater Site
- HPD Overlay
- Simulcast Subsystem
- Console Site
- Conventional Channel Support
- Site Statuses
- Module 4 Summary
- Module 4 Review Quiz

Module 5: Information Types and Paths

- Control Information
- Control Path
- Voice Information
- Voice Path
- Data
- Data Path
- Data Path – HPD
- Data Path – Enhanced Data
- Network Management Information
- Network Management Path
- Information Paths Routing
- Routing Failure Scenarios
- Module 5 Summary
- Module 5 Review Quiz

Module 6: Voice and Data Processing

- Finding the Control Channel
- Affiliation and Registration
- Channel Request
- Authorizing the Call
- Assignment of Resources
- Busy Queue
- Call in Progress
- Finishing a Call
- Enhanced Data on Reserved Access Channel
- Data Packets and Signal Flow
- Module 6 Summary
- Module 6 Review Quiz

Module 7: Mobility Management

- Affiliation and Registration
- Valid Sites for an Individual
- Valid Sites for a Talkgroup
- Site Access Denial Type



- Dynamic Site Assignment
- Continuous Assignment Updating
- De-registration
- Roaming
- Adjacent Sites
- RSSI Threshold
- Preferred Site
- Always Preferred Site
- Least Preferred Site
- Out of Range
- Inbound and Outbound
- Balanced Coverage
- Out-of-range Indications
- Scanning
- Priorities in Scan
- Requested Site
- Module 7 Summary
- Module 7 Review Quiz

Final Assessment



7.9.4.4 ASTRO 25 IV&D Introduction to Radio System Management Applications

ACS713201

Delivery Method

OLT = Online Training

Duration

10 hours

Target Audience

System Managers, Technical System Managers, System Technicians, and other Application Users.

Course Overview

This virtual, interactive course provides a high-level overview of the Motorola Radio System Management applications through recorded demonstrations of common system tasks.

Prerequisites

Completion of the following courses or equivalent knowledge:

- Bridging the Knowledge Gap – Technicians (ACT100).

Required:

Take one of the following depending on system supporting:

- ASTRO® 25 IV&D with M Core System Overview (ACS713200).
- ASTRO® 25 IV&D Conventional with M Core Overview (ACS713420).
- ASTRO® 25 IV&D with L Core System Overview (ACS713430).

Learning Outcomes

After completing the course the participant will be able to:

- Describe the purpose of Network Management applications used in an ASTRO system.
- Identify high-level capabilities of those Network Administrator applications.
- Familiarize with common operations allowed by those Network Administrator applications.



Course Modules

Module 1:

- System Profile
- Zone Profile
- ZoneWatch
- ATIA Log Viewer

Module 2:

- Unified Event Manager (UEM)
- Affiliation Display

Module 3:

- Radio Control Manager (RCM)
- Reports

Module 4:

- Provisioning Manager

Module 5:

- EMC Ionix Network Configuration Manager



7.9.4.5 ASTRO 25 Domain Controller Administration

AST2015.00L

Duration:

3 days

Delivery Method:

ILT – Instructor-led training

Target Audience:

System Administrators, Technical System Administrators and System Technicians

Course Synopsis:

This workshop covers the administrator and management functions in the ASTRO 25 Domain Controller and how these functions affect both users and computers in the ASTRO 25 system. The learning activities in this course focus on how to use the Domain Controllers to authenticate, administer, and authorize users and devices in the ASTRO 25 System. Group Policies and Organizational Units, RADIUS, and DNS structure will be addressed during this course.

The applications in this course only apply to customers with releases 7.4 or newer.

Prerequisites:

Completion of the following courses or equivalent knowledge:

- ASTRO 25 IV&D with M Core System Overview (ACS714200).
- ASTRO 25 IV&D Conventional with M Core Overview (ACS714420).
- ASTRO 25 IV&D with L Core System Overview (ACS714430).

Course Objectives:

After completing the course, the participant will be able to:

- Understand the Domain Controller server platform.
- Understand the DNS Hierarchy in the ASTRO25 system.
- Implement RADIUS authentication in applicable devices in an ASTRO 25 system.
- Use Active Directory to control users in the ASTRO 25 system.
- Understand Group Policy objects and how they impact users in the ASTRO 25 Domain.



Course Modules:

Module 1: Course Introduction

Module 2: Underlying Administrative Software

Module 3: Domain Controller Software

Module 4: Authentication and Authorization

Module 5: Domain Controller Implementation

Module 6: Groups, Users, and Policies

Module 7: Troubleshooting Issues



7.9.4.6 ASTRO® 25 IV&D Radio System Administrator Workshop

ACS714102

Duration:

5 days

Delivery Method:

ILT – Instructor-led training

Target Audience:

System Administrators, Technical System Administrators and System Technicians

Course Synopsis:

This workshop covers the administrator functions for an ASTRO 25 Integrated Voice and Data (IV&D) System. Learning activities in this course focus on how to use the different ASTRO 25 IV&D System Management applications. Participants will have an opportunity to discuss how to structure their organization and personnel for optimal ASTRO 25 IV&D system use.

The applications in this course only apply to customers with releases 7.4 or newer.

Prerequisite:

Completion of the following courses or equivalent knowledge:

- Bridging the Knowledge Gap – System Administrators (ACT101).
- Networking Essentials in Communication Equipment (NST762).
- Advanced Networking in Motorola Communications Equipment (NWT003).

Take one of the following depending on system supporting:

- ASTRO 25 IV&D with M Core System Overview (ACS714200).
- ASTRO 25 IV&D Conventional with M Core Overview (ACS714420).
- ASTRO 25 IV&D with L Core System Overview (ACS714430).
- ASTRO 25 IV&D Introduction to Radio System Management Applications (ACS713201).

Course Objectives:

After completing the course the participant will be able to:

- Describe the relationship between radio programming, console administration and system management, and the impact of this relationship on system planning.
- List the network management tools applicable at each phase of the system life cycle.
- Identify the advantages and disadvantages of options available for the configuration of system infrastructure and user parameters.
- Use the report and real-time data to monitor performance and make adjustments necessary to maintain acceptable system performance levels.
- Explain the key factors that affect the planning of ASTRO 25 Radio Systems and



create a Fleetmap.

Course Modules:

Module 1: Course Introduction

Module 2: Basic Concepts of Radio System Administration

2-1: Why Did They do it That Way?

2-2: Radio Programming vs. System Management

2-3: List of Management Applications

Module 3: Configuration

3-1: Configuration Process and Tools

3-2: Adding Radios and Talkgroups to the System

3-3: Editing Existing Records in PM

3-4: Setting System-Level Parameters

3-5: Creating Managers and Controlling Access

3-6: Managing Configurations with UNC

3-7: Configuring Sites and Channels with PM

Module 4: Operation and Optimization

4-1: License Sharing

4-2: Live Monitoring of the System

4-3: Report Generation

4-4: Network Maintenance Tools

Module 5: Communications Planning

5-1: Factors That Impact Communications System Planning

5-2: Fleetmapping



7.9.4.7 ASTRO 25 IV&D Secure Communications Workshop

ACS713207

Duration:

5 days

Delivery Method:

ILT – Instructor-led Training

Target Audience:

System Technicians, System Administrators, and Technical System Managers

This course applies only to customers with releases 7.4 or newer.

Course Synopsis:

This workshop describes planning, installation, configuration, operations, and troubleshooting of Secure Communications within the ASTRO 25 IV&D System.

Prerequisites:

Completion of the following courses or equivalent knowledge:

- Bridging the Knowledge Gap – Technicians (ACT100-E).
- Networking Essentials in Communication Equipment (NST762).

Learning Outcomes:

After completing the course the participant will be able to:

- Plan, organize, and implement Secure Communications in an ASTRO 25 IV&D system.
- Install and configure a Key Management Facility (KMF) system and related components.
- Demonstrate centralized key management using Over-the-Air-Rekeying (OTAR).
- Perform System Administrator functions using the KMF server and KMF client.
- Troubleshoot installation and configuration problems for the KMF server, KMF client, and KMF database.
- Implement end-to-end encryption using the MCC 7500 console subsystem.



Course Modules:

Module 1: Course Introduction

Module 2: System Overview

Topic 2-1: Secure Communications Concepts

Topic 2-2: Secure Equipment

Topic 2-3: Secure Communications in a Trunked System

Module 3: Planning and Organizing

Topic 3-1: Communication Patterns

Topic 3-2: Communications System Planning

Topic 3-3: Fleetmapping Class Exercise

Module 4: Hardware

Topic 4-1: KMF Hardware and Software

Topic 4-2: Components for Trunked Systems – M-cores and L-cores

Topic 4-3: Components for Conventional Systems – M-cores and K-cores

Module 5: Configuration

Topic 5-1: Configuring a Trunked System

Lab Activity 1: Configuring for Secure Trunking Calls

Topic 5-2: Configuring a Conventional System

Topic 5-3: Configuring the Key Variable Loader (KVL)

Lab Activity 2: Configuring KMF and KVL for OTAR Operations

Topic 5-4: Configuring the Radio

Lab Activity 3: Configuring Radios for OTAR Operations Using CPS

Topic 5-5: Configuring the Key Management Facility (KMF)

Lab Activity 4: Configuring OTAR Keys and Devices

Module 6: Over the Air Rekeying (OTAR) and Over the Ethernet Rekeying (OTEK)

Topic 6-1: Managing Currency

Topic 6-2: OTAR Commands

Lab Activity 5: OTAR Operations



Module 7: Administering and Monitoring

Topic 7-1: Security Management

Topic 7-2: Performance tools for Key Management

Topic 7-3: Performance Management for Trunked Systems

Topic 7-4: Performance Management for Conventional Systems

Topic 7-5: Administering the KMF Server

Lab Activity 6: Loading Keys in MCC 7500

Lab Activity 7: Back Ups

Module 8: Fault Management and Troubleshooting

Topic 8-1: Fault Management

Topic 8-2: Detection, Diagnostics, and Monitoring Tools

Topic 8-3: Troubleshooting the KMF Server

Topic 8-4: Troubleshooting the KMF Client

Topic 8-5: Troubleshooting the KMF Database

Topic 8-6: Troubleshooting the KMF Subsystem

Topic 8-7: Troubleshooting a Secure MCC 7500 and MCC 7500 AIS

Topic 8-8: Troubleshooting Radio Unit Problems



7.9.4.8 MCC 7500 Console Operator

Duration:

4 hours

Delivery Method:

ILT - Instructor-led training

Target Audience:

Dispatch Console Operators, Supervisors, System Administrators, and Support Personnel

Course Synopsis:

This course provides participants with an introduction to the dispatch console, its basic operation and tailored job aids which will be available for assistance in operation. Through facilitation and hands-on activities, the user learns how to perform common tasks associated with the console operation.

Course Objectives:

- Perform basic operational tasks of the dispatch console.
- Utilize the provided job aids to perform specific tasks associated with the console.
- Understand a high level view of the system configuration.
- High-level overview of the customer system configuration.
- General console operation.
- Proper operating procedures for specific customer features.

Recommended Prerequisites:

None

Key Topics:

- Overview.
- Communicating with Radios.
- Advanced Signaling Features.
- Resource Groups.
- Working with Configurations.
- Working with Aux IOs.
- Troubleshooting.



7.9.4.9 MCC 7500 Console Supervisor

Duration:

4 hours Operator, plus

4 hours Admin

Delivery Method:

ILT - Instructor-led training

Target Audience:

Dispatch Supervisors and System Administrators

Admin Course Synopsis:

This course provides participants with the knowledge and skills to manage and utilize the MCC 7500 console administrator functions. Through facilitation and hands-on activities, the participant learns how to customize the console screens.

Course Objectives:

- Understand the menu items and tool bar icons.
- Edit folders, multi-select/patch groups, auxiliary input output groups, windows and toolbars.
- Add/delete folders.

Recommended Prerequisites:

None

Key Topics:

- Introduction.
- Configurations.
- Folders and Resource Setup.
- Customizing Folders.
- Auto Starting the MCC 7500 Dispatch Console.
- Editing Preferences.
- Configuring the Toolbar.
- Setting Up Aux IOs.
- Resource Groups.



7.9.4.10 MCC 7500 Console Operator

Duration:

4 hours

Delivery Method:

ILT - Instructor-led training

Target Audience:

Dispatch Console Operators, Supervisors, System Administrators, and Support Personnel

Course Synopsis:

This course provides participants with an introduction to the dispatch console, its basic operation and tailored job aids which will be available for assistance in operation. Through facilitation and hands-on activities, the user learns how to perform common tasks associated with the console operation.

Course Objectives:

- Perform basic operational tasks of the dispatch console.
- Utilize the provided job aids to perform specific tasks associated with the console.
- Understand a high level view of the system configuration.
- High-level overview of the customer system configuration.
- General console operation.
- Proper operating procedures for specific customer features.

Recommended Prerequisites:

None

Key Topics:

- Overview.
- Communicating with Radios.
- Advanced Signaling Features.
- Resource Groups.
- Working with Configurations.
- Working with Aux IOs.
- Troubleshooting.



7.9.4.11 ASTRO® 25 IV&D M Core Workshop

ACS714103

Duration:

5 days

Delivery Method:

ILT – Instructor-led training

Target Audience:

M Core Master Site Technicians

Course Synopsis:

The ASTRO 25 IV&D with M Core course teaches advanced troubleshooting skills and best practices for the Trunked Large Systems. The course also focuses on gathering and analyzing system information to implement appropriate action(s) that return a system to full operational status.

Prerequisites:

Completion of the following courses or equivalent knowledge:

- Bridging the Knowledge Gap (ACT100 or ACT101).
- Networking Essentials in Communication Equipment (NST762).
- Advanced Networking in Motorola Communications Equipment (NWT003).

Select one of the following depending on system supporting:

- ASTRO 25 IV&D with M Core System Overview (ACS714200).
- ASTRO 25 IV&D Conventional with M Core Overview (ACS714420).
- ASTRO 25 IV&D with L Core System Overview (ACS714430).
- ASTRO 25 IV&D Introduction to Radio System Management Applications (ACS713201).

Course Objectives:

After completing the course, the participant will be able to:

- Describe the ASTRO 25 System architecture.
- Identify the functional and radio subsystems that comprise the ASTRO 25 System.
- Explain and discuss call flow and data flow through Large System Core devices and their subsystems.
- Perform recommended routine maintenance procedures for the ASTRO 25 Large System Core.
- Utilize the troubleshooting tools to diagnose a fault and restore the Large System Core to the level of the Motorola-supported service strategy.



Course Modules:

Module 1: Course Introduction

Module 2: Overview of M Core Systems

2-1: System Review

2-2: Functional View – Call Processing (Control) Path

2-3: Functional View – Audio Path

2-4: Functional View – Data Path

2-5: Information Assurance High-Level Overview Lab Activity

Module 3: System Troubleshooting Tools

3-1: Recommended Test Equipment

3-2: Troubleshooting Tools Overview

3-3: Detection and Monitoring Tools

3-4: Performance Management Tools

Module 4: Network Transport Subsystem

4-1: Network Transport Review

4-2: Core LAN Switch Lab Activity

4-3: Routers

4-4: Cooperative WAN Routing (CWR)

4-5: Ethernet Site Links

4-6: Diagnostic Tools

Module 5: Virtual Management Server (VMS) System Servers

5-1: Servers Overview

5-2: Virtual Management Server (VMS) Lab Activity

Module 6: Network Management and Zone Controller Applications

6-1: Zone Controller

6-2: Zone Controller Configuration

6-3: Network Management Overview

6-4: Network Management Servers

6-5: Network Management Databases



6-6: Network Management Clients

6-7: Network Management Applications Lab Activity

Module 7: Data Subsystem and Customer Enterprise Network (CEN) Interface

7-1: Integrated Voice and Data Description

7-2: Packet Data Gateway (PDG) Interface

7-3: “Global Packet Radio Service” Gateway Support Node (GGSN)

7-4: Customer Enterprise Network (CEN) Interface

7-5: Data Configuration

Module 8: Routine Maintenance and System Troubleshooting

8-1: Recommended Routine Maintenance

8-2: Database Backups

8-3: Network Device Configuration Backup

8-4: Appendix A: Routine Maintenance Schedules

8-5: Troubleshooting Hard Failures

8-6: Troubleshooting Intermittent Failures

8-7: System-Level Reliability

8-8: Intra-zone Reliability

8-9: Configuration Troubleshooting Lab Activity

7-5: Data Configuration

Appendix A: Non-CSA Server Architecture

Appendix B: MGEG & AEB – Dispatch Subsystems

B-1: Circuit-Based Dispatch Subsystem Overview

B-2: Motorola Gold Elite Gateway (MGEG)

B-3: Ambassador Electronics Bank (AEB)



7.9.4.12 ASTRO® 25 IV&D IP Based Digital Simulcast

ACS714217

Duration:

3 days

Delivery Method:

ILT – Instructor-led training

Target Audience:

Simulcast Site Technicians

Course Synopsis:

The ASTRO 25 IV&D IP Based Digital Simulcast workshop provides an understanding of the components that comprise the ASTRO 25 IV&D IP Simulcast subsystem, and how they operate in conjunction with each other. The workshop also explains the tools and methods available for troubleshooting components within the IP Based Simulcast subsystem.

Prerequisite:

Completion of the following courses or equivalent knowledge:

- Bridging the Knowledge Gap for Technicians (ACT100).
- Networking Essentials in Communication Equipment (NST762).
- Advanced Networking in Motorola Communications Equipment (NWT003).

Take one of the following depending on system supporting:

- ASTRO 25 IV&D with M Core System Overview (ACS714200).
- ASTRO 25 IV&D with L Core System Overview (ACS714430).

Course Objectives:

After completing the course, the participant will be able to:

- Recognize the flow of message and control data within an ASTRO 25 IV&D IP Digital Simulcast subsystem.
- Identify the major components and connections within an ASTRO 25 IV&D IP Digital Simulcast subsystem prime and remote sites.
- Recognize how calls are processed within an ASTRO 25 IV&D IP Digital Simulcast subsystem.
- Perform maintenance and troubleshooting of select components in an ASTRO 25 IV&D IP Digital Simulcast subsystem.



Course Modules:

Module 1: Course Introduction

Module 2: Repeater Site

2-1: Simulcast Review

2-2: IP Simulcast with GTR 8000 Subsystem Overview

2-3: Site Configurations

2-4: IP Simulcast – Integrated Voice and Data

Module 3: GCP 8000 Site Controller

3-1: GCP 8000 Overview

3-2: GCP 8000 Physical Description

3-3: GCP 8000 Configuration

3-4: GCP 8000 Diagnostics and Troubleshooting

Module 4: GTR 8000 Comparator

4-1: GCM 8000 Overview

4-2: GCM 8000 Physical Description

4-3: GCM 8000 Configuration

4-4: GCM Diagnostics and Troubleshooting

Module 5: IP Simulcast Network

5-1: Ethernet LAN Switches

5-1.1: Ethernet Switch – Overview

5-1.2: Ethernet Switch – Physical Description

5-1.3: Ethernet Switch – Configuration

5-1.4: Ethernet Switch – Diagnostics and Troubleshooting

5-2: Prime Site Routers/Gateways

5-2.1: Prime Site Routers/Gateways – Overview

5-2.2: Prime Site Routers/Gateways – Physical Description

5-2.3: Prime Site Routers/Gateways – Configuration

5-2.4: Prime Site Routers/Gateways – Diagnostics and Troubleshooting



5-3: Remote Site Routers/Gateway

5-3.1: Remote Site Routers/Gateway – Overview

5-3.2: Remote Site Routers/Gateway – Physical Description

5-3.3: Remote Site Routers/Gateway – Configuration

5-3.4: Remote Site Routers/Gateway – Diagnostics and Troubleshooting

Module 6: TRAK 9100 Site Reference

6-1: TRAK 9100 Site Reference Overview

6-2: TRAK 9100 Site Reference Physical Description

6-3: TRAK 9100 Site Reference Installation and Configuration

6-4: TRAK 9100 Site Reference Diagnostics and Troubleshooting

Module 7: GTR 8000 Base Radio Subsystem

7-1: GTR 8000 Base Radio Subsystem Overview

7-2: GTR 8000 Base Radio Subsystem Physical Description

7-3: GTR 8000 Base Radio Subsystem Configuration

7-4: GTR 8000 Base Radio Subsystem Diagnostics and Troubleshooting

Module 8: Simulcast Subsystem Maintenance and Troubleshooting

8-1: Maintenance and Troubleshooting Overview

8-2: Troubleshooting Tools

8-3: Device Fault Management

8-4: Troubleshooting Process

8-5: Troubleshooting Site Links

8-6: Motorola Support Centers



7.9.4.13 ASTRO® 25 IV&D GTR8000 Repeater Site Workshop

ACS714208

Duration:

3 days

Delivery Method:

ILT – Instructor-led training

Target Audience:

GTR 8000 Site Technicians

Course Synopsis:

This workshop describes the components in the ASTRO 25 IV&D System Repeater Site with GTR 8000 expandable site subsystem. This course also presents how the GTR 8000 expandable site subsystem operates and explains the tools and methods available for troubleshooting components within the subsystem.

Prerequisite:

Completion of the following courses or equivalent experience:

- Bridging the Knowledge Gap for Technicians (ACT100).
- Networking Essentials in Communication Equipment (NST762).
- Advanced Networking in Motorola Communications Equipment (NWT003).

Select one of the following depending on system supporting:

- ASTRO 25 IV&D with M Core System Overview (ACS714200).
- ASTRO 25 IV&D with L Core System Overview (ACS714430).
- ASTRO 25 IV&D Introduction to Radio System Management Applications (ACS713201).

Course Objectives:

After completing the course, the participant will be able to:

- Describe the ASTRO 25 IV&D Repeater Site with GTR 8000 Expandable Site Subsystem configurations and components.
- Identify the GCP 8000 Site Controller functions and configuration requirements.
- Describe the connections and interfaces to the GCP 8000.
- Diagnose and troubleshoot the GCP 8000.
- Describe the functionality of the GTR 8000 Expandable Site Subsystem.
- Configure and troubleshoot the ASTRO 25 Repeater Site with GTR 8000 Expandable Site Subsystem.
- Configure and troubleshoot the Network Transport subsystem.



Course Modules:

Module 1: Course Introduction

Module 2: GTR 8000 Repeater Site

2-1: GTR 8000 Repeater Site Overview

2-2: Operational Modes

2-3: Site Configurations

2-4: Site Components

2-5: Time Synchronization and Frequency Reference

Test Your Understanding Exercise

Module 3: GCP 8000 Site Controller

3-1: GCP 8000 Overview

3-2: GCP 8000 Physical Description

3-3: GCP 8000 Configuration

3-4: GCP 8000 Diagnostics and Troubleshooting

Test Your Understanding Exercise

Module 4: GTR 8000 Expandable Site Subsystem

4-1: GTR 8000 Expandable Site Subsystem Overview

4-2: GTR 8000 Expandable Site Subsystem Theory of Operation

4-3: GTR 8000 Expandable Site Subsystem Configuration

4-4: GTR 8000 Expandable Site Subsystem Diagnostics and Troubleshooting

Test Your Understanding Exercise

Module 5: Radio Frequency Distribution System (RFDS)

5-1: RFDS Overview

5-2: RFDS Physical Description

5-3: RFDS Configuration

5-4: RFDS Diagnostics and Troubleshooting

Test Your Understanding Exercise

Module 6: Network Transport Subsystem

6-1: Network Transport Subsystem Overview



6-2: Ethernet Switch Diagnostics and Troubleshooting

6-3: Site Gateways

6-4: Gateway Diagnostics and Troubleshooting

Test Your Understanding Exercise

Module 7: GTR 8000 Site Maintenance and Troubleshooting

7-1: Troubleshooting Tools

7-2: Troubleshooting Methodology

7-3: Troubleshooting Repeater Site Link

7-4: Motorola Support Centers



7.9.4.14 MCC 7000 Series Dispatch Consoles Overview

CON014

Duration:

1 hour

Delivery Method:

OLT – Online training

Target Audience:

System Administrators and Console Technicians

Course Synopsis:

This course provides an overview of the MCC 7000 series of Dispatch Consoles. It includes a description of the features and illustrations of subsystem architecture options. Descriptions of subsystem components and illustrations of signal flow and call processing are also included.

Prerequisite:

Completion of the following courses or equivalent knowledge:

- Bridging the Knowledge Gap (ACT100-E or ACT101-E).
- Networking Essentials in Communication Equipment (NST762).
- Advanced Networking in Motorola Communications Equipment (NWT003).

Required:

Select the System Overview specific to your ASTRO 25 IV&D Core:

- ASTRO 25 IV&D with M Core System Overview (ACS714200).
- ASTRO 25 IV&D Conventional with M Core System Overview (ACS714420).
- ASTRO 25 IV&D with L Core System Overview (ACS714430).
- ASTRO 25 IV&D Conventional with K Core System Overview (ACS714400).
- ASTRO 25 IV&D Introduction to Radio System Management Applications (ACS713201).

Course Objectives:

After completing the course, the participant will be able to:

- Describe the features of MCC 7000 series of Dispatch Consoles.
- Explain various system architectures for Dispatch Console subsystems.
- Describe system components in a Dispatch Console subsystem.
- Describe the signal flow of call processing from a Dispatch Console.



Course Modules:

Module 1: Course Introduction

Module 2: Console Architectures

2-1: Introduction

2-2: Co-located Console Sites

2-3: Remote Console Sites

2-4: CENTRACOM Interoperability

2-5: Dispatch Console Subsystem

2-6: Conventional Configurations

Module 3: Console Subsystem Components

3-1: Introduction

3-2: Console Operator Position

3-3: MCC 7500 with GPIOM

3-4: MCC 7500 with Voice Processing Module (VPM)

3-5: MCC 7100

3-6: Logging System

3-7: Console Alias Manager - MKM 7000

3-8: Auxiliary I/O Server

3-9: Conventional Channel Gateway

3-10: Conventional Site Controller

Module 4: Console Features

4-1: Capacity

4-2: Example of Console Functions

4-3: Administrator and Dispatcher Applications

4-4: Over-the-Ethernet Keying (OTЕК)

Module 5: Call Processing

5-1: Introduction

5-2: Link Op



5-3: Call Request

5-4: Call Setup

5-5: Call Grant

5-6: Audio Routing

5-7: Call Continuation or Teardown



7.9.4.15 MCC 7000 Series Dispatch Consoles Workshop

CON012

Duration:

4 Days

Delivery Method:

ILT – Instructor-led training

Target Audience:

System Administrators and Console Technicians

Course Synopsis:

This course familiarizes participants with the installation, configuration, management and repair of MCC 7000 Series IP dispatch consoles. It also covers Archiving Interface Servers, AUX I/O servers, and Conventional Channel Gateways. The focus is on a detailed discussion of console hardware and hands-on activities with the installation and configuration of the MCC 7000 Series IP dispatch consoles.

Prerequisite:

Completion of the following courses or equivalent knowledge:

- Bridging the Knowledge Gap (ACT100-E or ACT101-E).
- Networking Essentials in Communication Equipment (NST762).
- Advanced Networking in Motorola Communications Equipment (NWT003).

Required:

- MCC 7000 Series Console Overview (CON014).
- ASTRO 25 IV&D with M Core System Overview (ACS714200).
- Introduction to Radio System Management Applications (ACS713201).

Course Objectives:

After completing the course, the participant will be able to:

- Install and configure the hardware and software components of the MCC 7000 Dispatch Console Subsystem .
- Perform MCC 7000 Series site connectivity and bandwidth management.
- Perform System Administrator functions using the Elite Administrator software.
- Troubleshoot installation and configuration problems for the MCC 7000 Series Dispatch Consoles.

Lab Requirements:

- AIS.
- AUX I/O servers.
- Network Management Terminals at a ratio of 1 for every 4 students to ensure proper hands-on training.



Course Modules:

Module 1: Course Introduction

Module 2: Dispatch Console Overview

2-1: Features

2-2: System Views

2-4: Call Processing

Module 3: Dispatch Console Hardware

3-1: Dispatch Console Configuration

Module 4: AUX I/Os

4-1: Auxiliary Inputs/Outputs (Aux I/Os)

Module 5: Conventional Communication

5-1: Conventional Communication

Module 6: Domain Controllers

6-1: Domain Controllers and Active Directory

Module 7: Administrator Functions

7-1: Editing Current Configurations

7-2: Setting Up Folders and Resources

7-3: Setting Up Auxiliary I/Os

7-4: Configuring Toolbars

7-5: Editing Preferences

7-6: Auto Starting the MCC 7500 Dispatch Console

7-7: Setting up Inbound Event Display

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APPENDIX D – NEGOTIATED PRICE

PROJECT NO. 14212

Appendix D Negotiated PRICE

PALM BEACH COUNTY RADIO SYSTEM

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PALM BEACH COUNTY NEGOTIATED PRICE

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1.1 GENERAL (TOTAL CONTRACT SUMMARY)

1.1 General		
Item		Price
A.	Total Turnkey System including Year 1 Warranty Service. This price must equal the total of pricing from Sections 1.2-1.14 of this Exhibit.	\$ 23,230,486
A-1	Additional System Features (Discounted Price Reflected) <ul style="list-style-type: none"> • Advanced Power Monitoring (11 sites) - \$225,209.00 • Infrastructure Presence Licenses (20,000) - \$30,000.00 • Infrastructure Location Licenses (10,000) - \$112,500.00 • Dual Polarization Microwave S-5 to S-25 - \$83,671.00 • TX Upgrade to S-25 - \$239,013.00 • 1 MCC7500 Console at S-21 - \$50,601.00 • ISSI connectivity to legacy P25 7.13 - \$100,669.00 • 1 MCC7500 Console at site S-25 – \$ 50,601.00 • P-25 Diagnostic Box - \$46,750.00 	\$ 939,014
A-2	Scope Reductions <ul style="list-style-type: none"> • Upgrade existing consoles at S-30 – \$(151,962) • Eliminate new consoles at S-23 – \$(173,782) 	\$(325,744)
A-3	Future Purchase Items to leverage system discount (Discounted Price Reflected) <ul style="list-style-type: none"> • 4 MCC7500 Consoles at S-15 – PBCFRD – (\$ 213,764.28) • Flashes – (\$1,201,522.50) • AIS for S-15 EM dispatch location. – (\$38,827.00) 	\$1,454,113
A-4	Negotiated No Charge Items	NC



1.1 General		
Item		Price
	<ul style="list-style-type: none"> Dynamic Talk Group and Dynamic Channel at 11 Sites Code plug development Gap warranty for accelerated console installation 	
	Negotiated System Summary	\$ 25,297,869
B	System Incentives <ul style="list-style-type: none"> Existing SmartZone System Trade-In Discount * \$ (2,500,000) P25 Master Site License Discount \$ (1,969,340) Large System Discount \$ (2,500,000) Customer Loyalty Discount \$ (800,000) Contract in 2015 Discount \$ (230,660) Technology Credit \$ (400,000) <p><i>*Final equipment trade in inventory to be determined by the County and made available following system acceptance. Motorola will not re-sell any trade-in equipment but will utilize trade-in equipment as appropriate to support legacy system maintenance. The trade-in incentives are not contingent upon actual trade in value.</i></p>	(\$ 8,400,000)
C	Life Cycle Agreement (Software Upgrade for Years 3, 6, 9, 12 and 15 and Technology Refresh for Years 6 and 12). This price equals the total pricing from Section 1.15 of this Appendix	\$ 3,275,227
	Negotiated System Total	\$ 20,173,096
D	Maintenance Service for Years 2 through 16. This price equals the total pricing from Section 1.16 of this Appendix	\$ 11,062,110
	Negotiated Contract Price	\$ 31,235,206



1.2 NETWORK CORE SITE EQUIPMENT

1.2 Network Core Site Equipment			
Primary Network Core Site Equipment			
Site Number: S-15			
	Qty.	Unit Price	Extended Price
Network Core Equipment (Geo-Redundant) (\$ 1,669,459	\$ 1,669,459
Switch, LAN, WAN Equipment (REQUIRED)		\$ 240,236	\$ 240,236
Network Monitoring and Control System		\$ 5,488	\$ 5,488
Server/Client Equipment	Included		
Logging Recorder Interfaces			NA
P25 ISSI Interface		\$ 386,120	\$ 386,120
Alarm Monitoring Equipment	Included		
P25 Data Gateway		\$ 24,665	\$ 24,665
Over-the-Air Rekeying (OTAR)		\$ 97,640	\$ 97,640
GPS		\$ 24,252	\$ 24,252
System Management/Alarm Terminals		\$ 66,012	\$ 66,012
UPS Power Systems	See Below		
Other Equipment (Specify)		\$ 65,557	\$ 65,557
Services: Installation, Optimization, Programming	LOT	\$ 14,553	\$ 14,553
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 2,644,309



1.3 SECONDARY (GEO-REDUNDANT) NETWORK CORE SITE EQUIPMENT

1.3 Secondary (Geo-Redundant) Network Core Site Equipment			
Secondary (Geo-Redundant) Network Core Site Equipment			
Site Number: S-25			
	Qty.	Unit Price	Extended Price
Network Core Equipment (Geo-Redundant)		\$ 309,448	\$ 309,448
Switch, LAN, WAN Equipment		\$ 183,840	\$ 183,840
Network Monitoring and Control System			N/A
Server/Client Equipment			N/A
Logging Recorder Interfaces			N/A
P25 ISSI Interface			N/A
Alarm Monitoring Equipment			N/A
P25 Data Gateway			N/A
Over-the-Air Rekeying (OTAR)			N/A
System Management/Alarm Terminals			N/A
UPS Power Systems	See Below		
Other Equipment (Specify)		\$ 18,181	\$ 18,181
Services: Installation, Optimization, Programming	LOT	\$ 43,577	\$ 43,577
Design and Engineering Services		\$ 32,188	\$ 32,188
Project Management		\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 605,373



1.4 SIMULCAST CONTROL POINT EQUIPMENT

1.4 Simulcast Control Point Equipment			
Primary Simulcast Control Point			
Site Number: S-15			
	Qty.	Unit Price	Extended Price
Simulcast Control Point Equipment		\$ 172,880	\$ 172,880
Switch, LAN, WAN Equipment		\$ 14,760	\$ 14,760
Simulcast System Receiver Voting		\$ 634,080	\$ 634,080
Simulcast Sync Equipment		\$ 43,881	\$ 43,881
UPS Power Systems		\$ 80,385	\$ 80,385
Generator			NA
Antenna System		\$ 6,902	\$ 6,902
Other Equipment (Specify) (OPTIONAL)		\$ 3,347	\$ 3,347
Services: Installation, Optimization, Programming	LOT	\$ 14,553	\$ 14,553
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 1,021,115



1.5 SECONDARY(Geo-Redundant) SIMULCAST CONTROL POINT EQUIPMENT

1.5 Secondary (Geo-Redundant) Simulcast Control Point Equipment			
Secondary (Geo-Redundant) Simulcast Control Point			
Site Number: S-25			
	Qty.	Unit Price	Extended Price
Simulcast Control Point Equipment		\$ 54,440	\$ 54,440
Switch, LAN, WAN Equipment		\$ 14,760	\$ 14,760
Simulcast System Receiver Voting		\$ 634,080	\$ 634,080
Simulcast Sync Equipment		\$ 27,708	\$ 27,708
UPS Power Systems		\$ 46,172	\$ 46,172
Other Equipment (Specify) (OPTIONAL)		\$ 3,048	\$ 3,048
Services: Installation, Optimization, Programming	LOT	\$ 14,553	\$ 14,553
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 845,089



1.6 DISPATCH CENTER EQUIPMENT

Site Number: S-10

1.6 Dispatch Center Equipment			
Dispatch Equipment			
Site Number: S-10			
	Qty.	Unit Price	Extended Price
Dispatch Consoles	2	\$ 39,219	\$ 78,438
Console LAN/WAN/Electronics		\$ 10,320	\$ 10,320
Auxiliary I/O Interfaces		\$ 1,936	\$ 1,936
Logging Recorder Interfaces			NA
Conventional Channel/Interoperability Gateways			NA
Control Station Radio Equipment			NA
Equipment - Other		\$ 733	\$ 733
Services: Installation, Optimization, Programming	LOT	\$ 20,202	\$ 20,202
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 161,956



Site Number: S-13

1.6 Dispatch Center Equipment			
Dispatch Equipment			
Site Number: S-13			
	Qty.	Unit Price	Extended Price
Dispatch Consoles	2	\$ 39,219	\$ 78,438
Console LAN/WAN/Electronics		\$ 10,320	\$ 10,320
Auxiliary I/O Interfaces		\$ 1,936	\$ 1,936
Logging Recorder Interfaces			NA
Conventional Channel/Interoperability Gateways			NA
Control Station Radio Equipment			NA
Equipment - Other		\$ 733	\$ 733
Services: Installation, Optimization, Programming	LOT	\$ 20,202	\$ 20,202
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 161,956



Site Number: S-15

1.6 Dispatch Center Equipment			
Dispatch Equipment			
Site Number: S-15			
	Qty.	Unit Price	Extended Price
Dispatch Consoles	3	\$ 39,003	\$ 117,009
Console LAN/WAN/Electronics		\$ 10,320	\$ 10,320
Auxiliary I/O Interfaces		\$ 1,936	\$ 1,936
Logging Recorder Interfaces			NA
Conventional Channel/Interoperability Gateways		\$ 50,440	\$ 50,440
Control Station Radio Equipment	18	\$ 5,604	\$ 100,872
Equipment - Other		\$ 733	\$ 733
Services: Installation, Optimization, Programming	LOT	\$ 40,221	\$ 40,221
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 371,859



Site Number: S-15

1.6 Dispatch Center Equipment			
Dispatch Equipment			
Site Number: S-15			
Description	Qty.	Unit Price	Extended Price
Dispatch Consoles	14	\$ 39,123	\$ 547,717
Console LAN/WAN/Electronics		\$ 10,320	\$ 10,320
Auxiliary I/O Interfaces		\$ 1,936	\$ 1,936
Logging Recorder Interfaces		\$ 40,845	\$ 40,845
Conventional Channel/Interoperability Gateways		\$ 34,120	\$ 34,120
Control Station Radio Equipment	9	\$ 5,647	\$ 50,819
Equipment - Other		\$ 1,129	\$ 1,129
Services: Installation, Optimization, Programming	LOT	\$ 61,781	\$ 61,781
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 798,994



Site Number: S-20

1.6 Dispatch Center Equipment			
Dispatch Equipment			
Site Number: S-20			
	Qty.	Unit Price	Extended Price
Dispatch Consoles	4	\$ 38,353	\$ 153,411
Console LAN/WAN/Electronics		\$ 10,320	\$ 10,320
Auxiliary I/O Interfaces		\$ 1,936	\$ 1,936
Logging Recorder Interfaces		\$ 40,845	\$ 40,845
Conventional Channel/Interoperability Gateways		\$ 25,960	\$ 25,960
Control Station Radio Equipment	2	\$ 5,944	\$ 11,888
Equipment - Other		\$ 733	\$ 733
Services: Installation, Optimization, Programming	LOT	\$ 29,360	\$ 29,360
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 324,781



Site Number: S-21

1.6 Dispatch Center Equipment			
Dispatch Equipment			
Site Number: S-21			
	Qty.	Unit Price	Extended Price
Dispatch Consoles	2	\$ 39,219	\$ 78,438
Console LAN/WAN/Electronics		\$ 10,320	\$ 10,320
Auxiliary I/O Interfaces		\$ 1,936	\$ 1,936
Logging Recorder Interfaces			NA
Conventional Channel/Interoperability Gateways			NA
Control Station Radio Equipment			NA
Equipment - Other		\$ 733	\$ 733
Services: Installation, Optimization, Programming	LOT	\$ 23,317	\$ 23,317
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 165,071



Site Number: S-23

1.6 Dispatch Center Equipment			
Dispatch Equipment			
Site Number: S-23			
	Qty.	Unit Price	Extended Price
Dispatch Consoles	2	\$ 39,219	\$ 78,438
Console LAN/WAN/Electronics		\$ 10,320	\$ 10,320
Auxiliary I/O Interfaces		\$ 1,936	\$ 1,936
Logging Recorder Interfaces		\$ 40,845	\$ 40,845
Conventional Channel/Interoperability Gateways		\$ 17,800	\$ 17,800
Control Station Radio Equipment	2	\$ 5,944	\$ 11,888
Equipment - Other		\$ 733	\$ 733
Services: Installation, Optimization, Programming	LOT	\$ 25,769	\$ 25,769
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 238,057



Site Number: S-26

1.6 Dispatch Center Equipment			
Dispatch Equipment			
Site Number: S-26			
	Qty.	Unit Price	Extended Price
Dispatch Consoles	1	\$ 39,332	\$ 39,332
Console LAN/WAN/Electronics		\$ 6,960	\$ 6,960
Auxiliary I/O Interfaces		\$ 1,936	\$ 1,936
Logging Recorder Interfaces			NA
Conventional Channel/Interoperability Gateways			NA
Control Station Radio Equipment			NA
Equipment - Other		\$ 733	\$ 733
Services: Installation, Optimization, Programming	LOT	\$ 18,479	\$ 18,479
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 117,767



Site Number: S-29

1.6 Dispatch Center Equipment			
Dispatch Equipment			
Site Number: S-29			
	Qty.	Unit Price	Extended Price
Dispatch Consoles	17	\$ 39,600	\$ 554,398
Console LAN/WAN/Electronics		\$ 10,320	\$ 10,320
Auxiliary I/O Interfaces		\$ 1,936	\$ 1,936
Logging Recorder Interfaces		\$ 40,845	\$ 40,845
Conventional Channel/Interoperability Gateways		\$ 33,320	\$ 33,320
Control Station Radio Equipment	4	\$ 5,753	\$ 23,011
Equipment - Other		\$ 1,525	\$ 1,525
Services: Installation, Optimization, Programming	LOT	\$ 59,455	\$ 59,455
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 775,137



Site Number: S-30

1.6 Dispatch Center Equipment			
Dispatch Equipment			
Site Number: S-30			
	Qty.	Unit Price	Extended Price
Dispatch Consoles	5	\$ 39,259	\$ 196,293
Console LAN/WAN/Electronics		\$ 10,320	\$ 10,320
Auxiliary I/O Interfaces		\$ 1,936	\$ 1,936
Logging Recorder Interfaces			NA
Conventional Channel/Interoperability Gateways			NA
Control Station Radio Equipment			NA
Equipment - Other		\$ 733	\$ 733
Services: Installation, Optimization, Programming	LOT	\$ 21,045	\$ 21,045
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 280,655



1.7 SIMULCAST SITE

Site Number: S-3

1.7 Simulcast Site			
Simulcast Site			
Site Number: S-3			
	Qty.	Unit Price	Extended Price
Simulcast Site Controller			NA
Simulcast Site LAN, WAN Equipment		\$ 10,320	\$ 10,320
Simulcast Site Sync Equipment		\$ 40,425	\$ 40,425
Simulcast Site Base Stations (24 Channels)	24	\$ 31,040	\$ 744,960
Simulcast Site Antenna System		\$ 132,231	\$ 132,231
Simulcast Site Alarm Monitoring Equipment		\$ 4,192	\$ 4,192
UPS Power Systems for Radio			NA
Simulcast Site Backup Generator Equipment			NA
Equipment - Other		\$ 3,337	\$ 3,337
Tower Structural Analysis		\$ 5,925	\$ 5,925
Simulcast Site - Site Development Work		\$ 32,037	\$ 32,037
Services: Installation, Optimization, Programming	LOT	\$ 46,202	\$ 46,202
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Frequency Coordination, FCC Licensing	INCLUDED		
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 1,069,956



Site Number: S-4

1.7 Simulcast Site			
Simulcast Site			
Site Number: S-4			
	Qty.	Unit Price	Extended Price
Simulcast Site Controller			NA
Simulcast Site LAN, WAN Equipment		\$ 10,320	\$ 10,320
Simulcast Site Sync Equipment		\$ 40,425	\$ 40,425
Simulcast Site Base Stations (24 Channels)	24	\$ 31,040	\$ 744,960
Simulcast Site Antenna System		\$ 106,310	\$ 106,310
Simulcast Site Alarm Monitoring Equipment		\$ 4,192	\$ 4,192
UPS Power Systems for Radio			NA
Simulcast Site Backup Generator Equipment			NA
Equipment - Other		\$ 3,317	\$ 3,317
Tower Structural Analysis		\$ 4,025	\$ 4,025
Simulcast Site - Site Development Work		\$ 13,295	\$ 13,295
Services: Installation, Optimization, Programming	LOT	\$ 64,664	\$ 64,664
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Frequency Coordination, FCC Licensing	INCLUDED		
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 1,041,835



Site Number: S-5

1.7 Simulcast Site			
Simulcast Site			
Site Number: S-5			
	Qty.	Unit Price	Extended Price
Simulcast Site Controller			NA
Simulcast Site LAN, WAN Equipment		\$ 10,320	\$ 10,320
Simulcast Site Sync Equipment		\$ 40,425	\$ 40,425
Simulcast Site Base Stations (24 Channels)	24	\$ 31,040	\$ 744,960
Simulcast Site Antenna System		\$ 129,364	\$ 129,364
Simulcast Site Alarm Monitoring Equipment		\$ 4,192	\$ 4,192
UPS Power Systems for Radio			NA
Simulcast Site Backup Generator Equipment			NA
Equipment - Other		\$ 3,317	\$ 3,317
Tower Structural Analysis		\$ 5,925	\$ 5,925
Simulcast Site - Site Development Work		\$ 23,881	\$ 23,881
Services: Installation, Optimization, Programming	LOT	\$ 51,148	\$ 51,148
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Frequency Coordination, FCC Licensing	INCLUDED		
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 1,063,860



Site Number: S-7

1.7 Simulcast Site			
Simulcast Site			
Site Number: S-7			
Description	Qty.	Unit Price	Extended Price
Simulcast Site Controller			NA
Simulcast Site LAN, WAN Equipment		\$ 10,320	\$ 10,320
Simulcast Site Sync Equipment		\$ 40,425	\$ 40,425
Simulcast Site Base Stations (24 Channels)	24	\$ 31,040	\$ 744,960
Simulcast Site Antenna System		\$ 130,220	\$ 130,220
Simulcast Site Alarm Monitoring Equipment		\$ 4,192	\$ 4,192
UPS Power Systems for Radio			NA
Simulcast Site Backup Generator Equipment			NA
Equipment - Other		\$ 3,317	\$ 3,317
Tower Structural Analysis		\$ 5,305	\$ 5,305
Simulcast Site - Site Development Work		\$ 31,542	\$ 31,542
Services: Installation, Optimization, Programming	LOT	\$ 46,202	\$ 46,202
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Frequency Coordination, FCC Licensing	INCLUDED		
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 1,066,811



Site Number: S-8

1.7 Simulcast Site			
Simulcast Site			
Site Number: S-8			
Description	Qty.	Unit Price	Extended Price
Simulcast Site Controller			NA
Simulcast Site LAN, WAN Equipment		\$ 10,320	\$ 10,320
Simulcast Site Sync Equipment		\$ 40,425	\$ 40,425
Simulcast Site Base Stations (24 Channels)	24	\$ 31,040	\$ 744,960
Simulcast Site Antenna System		\$ 127,338	\$ 127,338
Simulcast Site Alarm Monitoring Equipment		\$ 4,192	\$ 4,192
UPS Power Systems for Radio			NA
Simulcast Site Backup Generator Equipment			NA
Equipment - Other		\$ 3,317	\$ 3,317
Tower Structural Analysis		\$ 5,305	\$ 5,305
Simulcast Site - Site Development Work		\$ 30,935	\$ 30,935
Services: Installation, Optimization, Programming	LOT	\$ 46,202	\$ 46,202
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Frequency Coordination, FCC Licensing	INCLUDED		
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 1,063,321



Site Number: S-11

1.7 Simulcast Site			
Simulcast Site			
Site Number: S-11			
Description	Qty.	Unit Price	Extended Price
Simulcast Site Controller			NA
Simulcast Site LAN, WAN Equipment		\$ 10,320	\$ 10,320
Simulcast Site Sync Equipment		\$ 40,425	\$ 40,425
Simulcast Site Base Stations (24 Channels)	24	\$ 31,040	\$ 744,960
Simulcast Site Antenna System		\$ 119,978	\$ 119,978
Simulcast Site Alarm Monitoring Equipment		\$ 4,192	\$ 4,192
UPS Power Systems for Radio			NA
Simulcast Site Backup Generator Equipment			NA
Equipment - Other		\$ 3,317	\$ 3,317
Tower Structural Analysis		\$ 5,305	\$ 5,305
Simulcast Site - Site Development Work		\$ 28,996	\$ 28,996
Services: Installation, Optimization, Programming	LOT	\$ 46,202	\$ 46,202
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Frequency Coordination, FCC Licensing	INCLUDED		
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 1,054,023



Site Number: S-22

1.7 Simulcast Site			
Simulcast Site			
Site Number: S-22			
Description	Qty.	Unit Price	Extended Price
Simulcast Site Controller			NA
Simulcast Site LAN, WAN Equipment		\$ 10,320	\$ 10,320
Simulcast Site Sync Equipment		\$ 40,425	\$ 40,425
Simulcast Site Base Stations (24 Channels)	24	\$ 31,040	\$ 744,960
Simulcast Site Antenna System		\$ 112,476	\$ 112,476
Simulcast Site Alarm Monitoring Equipment		\$ 4,192	\$ 4,192
UPS Power Systems for Radio			NA
Simulcast Site Backup Generator Equipment			NA
Equipment - Other		\$ 3,317	\$ 3,317
Tower Structural Analysis		\$ 5,351	\$ 5,351
Simulcast Site - Site Development Work		\$ 27,087	\$ 27,087
Services: Installation, Optimization, Programming	LOT	\$ 46,202	\$ 46,202
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Frequency Coordination, FCC Licensing	INCLUDED		
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 1,044,656



Site Number: S-31

1.7 Simulcast Site			
Simulcast Site			
Site Number: S-31			
Description	Qty.	Unit Price	Extended Price
Simulcast Site Controller			NA
Simulcast Site LAN, WAN Equipment		\$ 10,320	\$ 10,320
Simulcast Site Sync Equipment		\$ 40,425	\$ 40,425
Simulcast Site Base Stations (24 Channels)	24	\$ 31,040	\$ 744,960
Simulcast Site Antenna System		\$ 151,851	\$ 151,851
Simulcast Site Alarm Monitoring Equipment		\$ 4,192	\$ 4,192
UPS Power Systems for Radio			NA
Simulcast Site Backup Generator Equipment			NA
Equipment - Other		\$ 3,317	\$ 3,317
Tower Structural Analysis		\$ 6,280	\$ 6,280
Simulcast Site - Site Development Work		\$ 42,558	\$ 42,558
Services: Installation, Optimization, Programming	LOT	\$ 46,202	\$ 46,202
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Frequency Coordination, FCC Licensing	INCLUDED		
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 1,100,432



Site Number: S-32

1.7 Simulcast Site			
Simulcast Site			
Site Number: S-32			
Description	Qty.	Unit Price	Extended Price
Simulcast Site Controller			NA
Simulcast Site LAN, WAN Equipment		\$ 10,320	\$ 10,320
Simulcast Site Sync Equipment		\$ 40,425	\$ 40,425
Simulcast Site Base Stations (24 Channels)	24	\$ 31,040	\$ 744,960
Simulcast Site Antenna System		\$ 130,586	\$ 130,586
Simulcast Site Alarm Monitoring Equipment		\$ 4,192	\$ 4,192
UPS Power Systems for Radio			NA
Simulcast Site Backup Generator Equipment			NA
Equipment - Other		\$ 3,317	\$ 3,317
Tower Structural Analysis		\$ 5,305	\$ 5,305
Simulcast Site - Site Development Work		\$ 36,375	\$ 36,375
Services: Installation, Optimization, Programming	LOT	\$ 46,202	\$ 46,202
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Frequency Coordination, FCC Licensing	INCLUDED		
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 1,072,010



Site Number: S-33

1.7 Simulcast Site			
Simulcast Site			
Site Number: S-33			
Description	Qty.	Unit Price	Extended Price
Simulcast Site Controller			NA
Simulcast Site LAN, WAN Equipment			NA
Simulcast Site Sync Equipment			NA
Simulcast Site Base Stations (24 Channels)			NA
Simulcast Site Antenna System		\$ 21,041	\$ 21,041
Simulcast Site Alarm Monitoring Equipment			NA
UPS Power Systems for Radio		\$ 42,690	\$ 42,690
Simulcast Site Backup Generator Equipment			NA
Equipment - Other		\$ 2,525	\$ 2,525
Tower Structural Analysis		\$ 4,024	\$ 4,024
Simulcast Site - Site Development Work		\$ 18,033	\$ 18,033
Services: Installation, Optimization, Programming	LOT	\$ 14,553	\$ 14,553
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Frequency Coordination, FCC Licensing	INCLUDED		
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 153,194



1.8 RECEIVE-ONLY SITE

1.8 Receive-Only Site			
Receive-Only Site			
Site Number: S-25			
Description	Qty.	Unit Price	Extended Price
Receive Site Controller			NA
Receive Site LAN, WAN Equipment		\$ 10,320	\$ 10,320
Receive Site Sync Equipment		\$ 40,425	\$ 40,425
Receive Site Receivers (24 Channels)	24	\$ 17,367	\$ 416,800
Receive Site Antenna System		\$ 13,736	\$ 13,736
Receive Site Alarm Monitoring Equipment		\$ 4,192	\$ 4,192
UPS/DC Power Systems for Radio and Microwave			NA
Receive Site Backup Generator Equipment		\$ 69,811	\$ 69,811
Equipment - Other		\$ 792	\$ 792
Tower Structural Analysis		\$ 5,925	\$ 5,925
Receive Site - Site Development Work		\$ 65,005	\$ 65,005
Services: Installation, Optimization, Programming	LOT	\$ 65,207	\$ 65,207
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 742,541



1.9 AIRCRAFT COMMUNICATIONS TOWER SITE

1.9 Aircraft Communications Tower Site			
Aircraft Communications Site			
Site Number: S-33			
Description	Qty.	Unit Price	Extended Price
Site Controller			NA
Switch, LAN, WAN Equipment		\$ 6,720	\$ 6,720
Base Stations (8 Channels)	8	\$ 45,459	\$ 363,672
Antenna System		\$ 4,654	\$ 4,654
Tower Structural Analysis			NA
UPS/DC Power Systems for Radio and Microwave			NA
Equipment - Other		\$ 1,203	\$ 1,203
Services: Installation, Optimization, Programming	LOT	\$ 14,553	\$ 14,553
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Frequency Coordination, Region 9 Approval, FCC Licensing	INCLUDED		
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 441,130



1.10 MICROWAVE NETWORK BACKHAUL SYSTEM

1.10 Microwave Network Backhaul System			
Microwave Network Site			
Site Number:			
Description	Qty.	Unit Price	Extended Price
Microwave Network Backhaul Equipment		\$ 567,953	\$ 567,953
Microwave Antenna Systems Equipment		\$ 780,906	\$ 780,906
Microwave Antenna Systems Dehydrator	Included Above with Antenna Systems		
Switch, LAN, WAN Equipment			
Alarm Monitoring and Network Management Equipment		\$ 20,960	\$ 20,960
Physical Path Surveys			
DC Power Systems for Microwave		\$ 240,251	\$ 240,251
Tower Structural Analysis and Mapping - Site S-1		\$ 6,280	\$ 6,280
Rooftop Analsys and X-Ray Site S-2		\$ 4,025	\$ 4,025
Tower Structural Analysis and Mapping - Site S-15		\$ 5,305	\$ 5,305
Tower Structural Analysis and Mapping - Site S-20		\$ 5,305	\$ 5,305
Site Development Work - Site S-1		\$ 7,723	\$ 7,723
Site Development Work - Site S-2		\$ 7,071	\$ 7,071
Site Development Work - Site S-15		\$ 10,046	\$ 10,046
Site Development Work - Site S-20		\$ 8,388	\$ 8,388
Services: Installation, Optimization, Programming	LOT	\$ 1,501,825	\$ 1,501,825
Design and Engineering Services	LOT	\$ 32,188	\$ 32,188
Project Management	LOT	\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 3,216,367



1.12 NPSPAC 800MHZ MUTUAL AID CHANNELS

1.12 NPSPAC 800MHz Mutual Aid Channels			
800MHz Conventional Analog			
Description	Qty.	Unit Price	Extended Price
800 MHz NPSPAC 8TAC92 Repeater (One Site)	1	\$ 11,904	\$ 11,904
800 MHz NPSPAC 8TAC93 (Repeater and Two Satellite Receivers, Voting System)	1	\$ 22,768	\$ 22,768
800 MHz NPSPAC 8TAC94 (Repeater and Two Satellite Receivers, Voting System)	1	\$ 17,568	\$ 17,568
Services: Installation, Optimization, Programming	LOT	\$ 14,553	\$ 14,553
Design and Engineering Services		\$ 32,188	\$ 32,188
Frequency Coordination, Region 9 Approval, FCC Licensing			NA
Project Management		\$ 18,140	\$ 18,140
Total Equipment and Services			\$ 117,120



1.13 TRAINING

1.13 Training		
Please list and price a Training Plan as described in this RFP. Please be descriptive on each line item so that the County understands the content, location, and the extent of training proposed in the system. It is required to list your Training Plan pricing below. All training is associated with Payment Category A.		
Description	Qty.	Unit of Measure
ASTRO 25 Fleetmapping Workshop (Instructor-led)	\$ 18,487	
ASTRO 25 IV&D System Applied Networking (Instructor-led)	\$ 18,487	
ASTRO 25 IV&D with M Core System Overview (Self-paced; On-line)	INCLUDED	
ASTRO 25 IV&D Introduction to Radio System Administration (Self-paced; On-line)	INCLUDED	
ASTRO 25 IV&D Domain Controller Administration Workshop (Instructor-led)	\$ 12,837	
ASTRO 25 IV&D Radio System Administrator Workshop (Instructor-led)	\$ 18,487	
Secure Communications (OTAR/KMF) Workshop (Instructor-led)	\$ 18,487	
ASTRO 25 ISSI 8000 / CSSI 8000 FEATURE OVERVIEW (Self-paced; On-line)	\$ 960	
Networking Lab Shipping and Leasing	\$ 3,333	
Console Operator & Admin – Train-the-Trainer	\$ 15,431	
Technician Maintenance Training	INCLUDED	
ASTRO 25 IV&D M Core Workshop (Instructor-led)	\$ 18,487	
ASTRO 25 IV&D IP Simulcast with GTR 8000 Repeater Site Workshop (Instructor-led)	\$ 18,487	
MCC7000 Series Dispatch Consoles Workshop (Instructor-led)	\$ 15,663	
Aviat - ProVision Field Training Class, 2 Days @ Customer Location	\$11,100	
Total Training	\$ 170,246	



1.14 RECOMMENDED SPARES AND TEST EQUIPMENT

1.14 Recommended Spares and Test Equipment			
Please list and price the recommended spares for the County to purchase to support the system.			
Description	Qty.	Unit Price	Extended Price
Recommended Network Core Spare Parts		\$ 231,552	\$ 231,552
Recommended Simulcast Control Point Spare Parts		\$ 8,616	\$ 8,616
Recommended Dispatch Equipment Spare Parts		\$ 20,187	\$ 20,187
Recommended Simulcast and Receive-Only Sites Spare Parts		\$ 9,425	\$ 9,425
Recommended Aircraft Communications Site Spare Parts		\$ 12,785	\$ 12,785
Recommended Microwave Network Backhaul Equipment Spare Parts		\$ 9,395	\$ 9,395
Recommended NPSPAC Mutual Aid Channels Spare Parts		\$ 8,905	\$ 8,905
Recommended Test Equipment *	N/A	N/A	N/A
Total Recommended Spare Parts and Test Equipment			\$ 300,865

♦ *Motorola FSO currently has all required test equipment inventory to support the Palm Beach County system



1.15 SOFTWARE UPGRADE AND TECHNOLOGY REFRESH

1.15 Software Upgrade and Technology Refresh	
Year 3	
Software Upgrade	\$ 335,148
Total Year 3 Software Upgrade Service	\$ 335,148
Year 6	
Software Upgrade	\$ 516,970
Technology Refresh	\$ 376,133
Total Year 6 Software Upgrade and Technology Refresh Service	\$ 893,104
Year 9	
Software Upgrade	\$ 535,731
Total Year 9 Software Upgrade Service	\$ 535,731
Year 12	
Software Upgrade	\$ 556,268
Technology Refresh	\$ 376,133
Total Year 12 Software Upgrade and Technology Refresh Service	\$ 932,401
Year 15	
Software Support Service	\$ 578,841
Total Year 15 Software Upgrade Service	\$ 578,841



1.16 MAINTENANCE SERVICES

1.16 Maintenance Services	
<p>Year 1 is the warranty maintenance period for the proposed system. The Vendor provided maintenance services for the system will be the same in years 2 -16 as provided under the Year 1 warranty. Annually, the County will issue a purchase order using this RFP and the Respondent's Proposal as the specifications and pricing. Service prices below are in effect through year 16, reflecting a 1.5% increase in years 7~16. SUS services were not a requirement of the RFP, but a service currently received and the County needs continued. The Lifecycle Agreement will run concurrently.</p>	
Year 2	
Dispatch Service	\$ 13,352
Technical Support Service	\$ 29,823
Infrastructure Repair Service	\$ 216,976
Network Monitoring Service	\$ 34,505
On-Site Infrastructure Response Service	\$ 181,866
Software Support Service	INCLUDED
Preventative Maintenance Service	\$ 45,882
Disaster Recovery Service	INCLUDED
Microwave Service	\$ 46,647
Total Year 2 Maintenance Service	\$ 569,051
Year 3	
Dispatch Service	\$ 13,553
Technical Support Service	\$ 30,270
Infrastructure Repair Service	\$ 220,231
Network Monitoring Service	\$ 35,023
On-Site Infrastructure Response Service	\$ 184,534
Software Support Service	INCLUDED
Preventative Maintenance Service	\$ 46,570
Disaster Recovery Service	INCLUDED
Microwave Service	\$ 74,832
Total Year 3 Maintenance Service	\$ 605,013
Year 4	
Dispatch Service	\$ 13,756
Technical Support Service	\$ 30,724
Infrastructure Repair Service	\$ 223,534
Network Monitoring Service	\$ 35,548
On-Site Infrastructure Response Service	\$ 187,363
Software Support Service	INCLUDED
Preventative Maintenance Service	\$ 47,263
Disaster Recovery Service	INCLUDED
Microwave Service	\$ 75,954
Total Year 4 Maintenance Service	\$ 614,142
Year 5	
Dispatch Service	\$ 13,962
Technical Support Service	\$ 31,185
Infrastructure Repair Service	\$ 226,887
Network Monitoring Service	\$ 36,082
On-Site Infrastructure Response Service	\$ 190,173



1.16 Maintenance Services

Year 1 is the warranty maintenance period for the proposed system. The Vendor provided maintenance services for the system will be the same in years 2 -16 as provided under the Year 1 warranty. Annually, the County will issue a purchase order using this RFP and the Respondent's Proposal as the specifications and pricing. Service prices below are in effect through year 16, reflecting a 1.5% increase in years 7-16. SUS services were not a requirement of the RFP, but a service currently received and the County needs continued. The Lifecycle Agreement will run concurrently.

Software Support Service	INCLUDED
Preventative Maintenance Service	\$ 47,978
Disaster Recovery Service	INCLUDED
Microwave Service	\$ 77,094
Total Year 5 Maintenance Service	\$ 623,361
Year 6	
Dispatch Service	\$ 14,172
Technical Support Service	\$ 31,653
Infrastructure Repair Service	\$ 230,290
Network Monitoring Service	\$ 36,623
On-Site Infrastructure Response Service	\$ 193,026
Software Support Service	INCLUDED
Preventative Maintenance Service	\$ 48,637
Disaster Recovery Service	INCLUDED
Microwave Service	\$ 78,520
Total Year 6 Maintenance Service	\$ 632,921
Year 7	
	\$ 632,898
Year 8	
	\$ 642,392
Year 9	
	\$ 652,027
Year 10	
	\$ 661,808
Year 11	
	\$ 671,735
Year 12	
	\$ 681,811
Year 13	
	\$ 692,038
Year 14	
	\$ 702,419
Year 15	



1.16 Maintenance Services	
Year 1 is the warranty maintenance period for the proposed system. The Vendor provided maintenance services for the system will be the same in years 2 -16 as provided under the Year 1 warranty. Annually, the County will issue a purchase order using this RFP and the Respondent's Proposal as the specifications and pricing. Service prices below are in effect through year 16, reflecting a 1.5% increase in years 7-16. SUS services were not a requirement of the RFP, but a service currently received and the County needs continued. The Lifecycle Agreement will run concurrently.	
	\$ 712,955
Year 16	
	\$ 723,649
Security Update Service	
Year 2	
Security Update Service	\$ 67,065
Year 3	
Security Update Service	\$ 69,020
Year 4	
Security Update Service	\$ 71,145
Year 5	
Security Update Service	\$ 73,270
Year 6	
Security Update Service	\$ 75,480
Year 7	
Security Update Service	\$ 77,690
Year 8	
Security Update Service	\$ 80,070
Year 9	
Security Update Service	\$ 82,450
Year 10	
Security Update Service	\$ 84,915
Year 11	
Security Update Service	\$ 87,465
Year 12	
Security Update Service	\$ 90,100
Year 13	
Security Update Service	\$ 92,820
Year 14	
Security Update Service	\$ 95,540
Year 15	
Security Update Service	\$ 98,430



1.16 Maintenance Services

Year 1 is the warranty maintenance period for the proposed system. The Vendor provided maintenance services for the system will be the same in years 2 -16 as provided under the Year 1 warranty. Annually, the County will issue a purchase order using this RFP and the Respondent's Proposal as the specifications and pricing. Service prices below are in effect through year 16, reflecting a 1.5% increase in years 7-16. SUS services were not a requirement of the RFP, but a service currently received and the County needs continued. The Lifecycle Agreement will run concurrently.

Year 16	
Security Update Service	\$ 98,430
Total	
Security Update Service	\$ 1,243,890



1.17 OPTIONAL PURCHASE ITEMS

1.17 Optional Purchase Items	
OPTIONAL: Price for Phase II TDMA, Dual-Mode on Remaining 13 Channels *	\$ 400,000
*Pricing reflects TDMA Customer Incentive with pricing validity 120 days	



SCHEDULE A - NEGOTIATED PAYMENT SCHEDULE

Customer will make payments to Motorola within thirty (30) days after the date of each invoice. Customer will make payments when due in the form of a check, cashier's check, or wire transfer drawn on a U.S. financial institution and in accordance with the following milestones.

Milestone	Description	Percent Payment of Total System Cost (Excludes Costs of Appendix H)
1	Acceptance of DDR by the County	10%
2	Substantial Completion #1	5%
3	Console Equipment Delivery	Actual Cost
4	Equipment Delivery to all staged equipment to sites or bonded warehouse (less previously invoiced consoles)	35%
5	Substantial Completion #2	25%
6	Substantial Completion #3	20%
7	Final System Acceptance	5%

Motorola reserves the right to make partial shipments specific to the accelerated console deployment and to request payment upon shipment of such equipment.

RFP Exhibit B, Section 16.2 is modified as follows: If the County withholds payment pending the disposition or settlement of a claim, Motorola will stop work until payment resumes. The parties will need to discuss the consequences of this event. If the County pays, Motorola will need to review and approve the need for the County to have taken such action prior to Motorola's agreement to reimburse the County.

APPENDIX E - EXHIBIT "D" TO THE RFP - RESPONSE CERTIFICATION FORM

PROJECT NO. 14212

I hereby certify that I am submitting my company's response and understand that by virtue of executing and returning with this response this Response Certification Form, I certify that all information is correct and I understand the contents and accept the conditions of the Request for Proposal and this Response Certification Form. I further certify that I have read the attached Contract, General Conditions, and Special Conditions and agree, if awarded this Contract, to the terms and conditions stated therein, without exception.

Acknowledgment of Addenda:

It is agreed that Respondent has received and understands all addenda issued by the County.

The Respondent acknowledges receipt of addenda as follows:

Addendum # <u>1</u> dated <u>04/09/15</u>	Addendum # <u>4</u> dated <u>04/30/15</u>
Addendum # <u>2</u> dated <u>04/14/15</u>	Addendum # <u>5</u> dated <u>05/04/15</u>
Addendum # <u>3</u> dated <u>04/28/15</u>	Addendum # <u>6</u> dated <u>05/05/15</u>

Statement of Participation in Contracts Subject to Nondiscrimination Clause:

The Respondent shall complete the following statement by checking the appropriate boxes:

The Respondent has (X) has not () participated in a previous contract subject to the nondiscrimination clause prescribed by Executive Order 10925, or Executive Order 11114, or Executive Order 11246.

The Respondent has (X) has not () submitted all compliance reports in connection with any such contract, due under the applicable filing requirements; and that representations indicating submission of required compliance reports signed by proposed subcontractors will be obtained prior to award of subcontracts.

If the Respondent has participated previously in a contract subject to the nondiscrimination clause and has not submitted compliance reports due under applicable filing requirements, the Respondent shall submit a compliance report on Standard Form 100, "Employee Information Report, EEO-1" prior to the award of the Contract.

Rev. 04/24/2015

Exhibit D Page 2

All entities doing business with Palm Beach County, Florida are required to submit a copy of their non-discrimination policy which shall be consistent with the policy of Palm Beach County, prior to entering into any contract with Palm Beach County. In the event an entity does not have a written nondiscrimination policy, such entity shall be required to sign a statement affirming their non-discrimination policy is in conformance with Palm Beach County's policy.

Check one:

(X) Respondent hereby agrees that its non-discrimination policy is consistent with the policy of Palm Beach County and will provide a copy prior to Contract execution, or

() Respondent does not have a written non-discrimination policy and affirms that its non-discrimination policy is in conformance with the policy of Palm Beach County.

The undersigned does hereby declare that the Response covers all expenses of every kind incidental to the completion of said Work and the Agreement therefore, including all claims that may arise through damages or other causes whatsoever. The undersigned does hereby declare that it shall make no claim on account of any variation from any estimate in the quantities of Work to be done, nor on account of any misunderstanding or misconception of the nature of the Work to be done or the grounds, site conditions, or place where the Work is to be done.

The undersigned does hereby declare that it shall and each subcontractor shall pay each employee a living wage as provided for in the Palm Beach County Living Wage Ordinance.

**Please see attached updates to paragraphs below.

RESPONDENT (firm name): Motorola Solutions, Inc.

PRINT NAME OF AUTHORIZED REPRESENTATIVE: Marshall M. Wright

SIGNATURE OF AUTHORIZED REPRESENTATIVE: 

TITLE: MSSSI Vice President DATE: 05/21/15

APPENDIX F COMPLETED BONDS AND INSURANCE FORMS

1. Completed Bonds

Provided on the following pages.

PUBLIC CONSTRUCTION BOND

BOND NUMBER K09316693

BOND AMOUNT \$16,897,869.00

CONTRACT AMOUNT \$16,897,869.00

CONTRACTOR'S NAME: Motorola Solution Inc.

CONTRACTOR'S ADDRESS: 8000 West Sunrise Blvd. Plantation, Fl 33322

CONTRACTOR'S PHONE: 954-410-6624

SURETY COMPANY: Westchester Fire Insurance Company

SURETY'S ADDRESS: 436 Walnut Street, Philadelphia, PA 19106

SURETY'S PHONE: 800-392-3770

OWNER'S NAME: PALM BEACH COUNTY BOARD OF COUNTY COMMISSIONERS
CAPITAL IMPROVEMENTS DIVISION

OWNER'S ADDRESS: 2633 Vista Parkway
West Palm Beach, FL 33411-5604

OWNER'S PHONE: (561) 233-0261

PROJECT NAME: APCO P25 TRUNKED SIMULCAST COUNTY WIDE PUBLIC SAFETY
RADIO SYSTEM

PROJECT NUMBER: _____

DESCRIPTION OF WORK: Furnish, Install, and maintain a Project 25 trunk radio system.

PROJECT LOCATION: Palm Beach County

LEGAL DESCRIPTION: _____

This Bond is issued in favor of the County conditioned on the full and faithful performance of the Contract

KNOW ALL MEN BY THESE PRESENTS: that Contractor and Surety, are held and firmly bound unto

Palm Beach County Board of County Commissioners
301 N. Olive Avenue
West Palm Beach, Florida 33401

as Obligee, herein called County, for the use and benefit of claimant as herein below defined, in the amount of (\$16,897,869.00) Sixteen Million Eight Hundred Ninety Seven Thousand Eight Hundred Sixty Nine and 00/100 Dollars

for the payment whereof Principal and Surety bind themselves, their heirs, personal representatives, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

Principal has by written agreement entered into a contract with the County for

Project Name: APCO P25 TRUNKED SIMULCAST COUNTY WIDE PUBLIC
SAFETY RADIO SYSTEM

Project No.: 14212

in accordance with Drawings and Specifications prepared by

NAME OF CONSULTANT FIRM:

Omnicom Consulting Group, Inc.
LOCATION OF FIRM: 2927 Habersham Dr. Tallahassee, Fl
32309 PHONE: (850) 792-4720
FAX:

which contract is by reference made a part hereof in its entirety, and is hereinafter referred to as the Contract.

THE CONDITION OF THIS BOND is that if Principal:

1. Performs the contract between Principal and County for the construction of APCO P25 Trunked Simulcast County Wide Public Safety Radio System


_____, the contract being made a part of this bond by reference, at the times and in the manner prescribed in the contract; and


2. Promptly makes payments to all claimants, as defined in Section 255.05, Florida Statutes, supplying Principal with labor, materials, or supplies, used directly or indirectly by Principal in the prosecution of the work provided for in the contract; and

3. Pays County all losses, damages (including liquidated damages), expenses, costs, and attorneys' fees, including appellate proceedings, that County sustains because of a default by Principal under the contract; and
4. Performs the guarantee of all work and materials furnished under the contract for the time specified in the contract, then this bond is void; otherwise it remains in full force.
5. Any changes in or under the contract documents and compliance or noncompliance with any formalities connected with the contract or the changes does not affect Surety's obligation under this bond and Surety waives notice of such changes.
6. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of construction liens which may be filed of record against said improvement, whether or not claim for the amount of such lien be presented under and against the bond.
7. Principal and Surety expressly acknowledge that any and all provisions relating to consequential, delay and liquidated damages contained in the contract are expressly covered by and made a part of this Performance, Labor and Material Payment Bond. Principal and Surety acknowledge that any such provisions lie within their obligations and within the policy coverages and limitations of this instrument.

Section 255.05, Florida Statutes, as amended, together with all notice and time provisions contained therein, is incorporated herein, by reference, in its entirety. Any action instituted by a claimant under this bond for payment must be in accordance with the notice and time limitation provisions in Section 255.05(2), Florida Statutes. This instrument regardless of its form, shall be construed and deemed a statutory bond issued in accordance with Section 255.05, Florida Statutes.

Any action brought under this instrument shall be brought in the court of competent jurisdiction in Palm Beach County and not elsewhere.


Witness


Witness Judi Lucky-Efimov

Motorola Solutions, Inc.


Principal (Seal)

ALI KAPADIA, MSSM VP

Title

Westchester Fire Insurance Company


Surety (Seal)

Sandra M. Winsted, Attorney-in-Fact

11/18/15

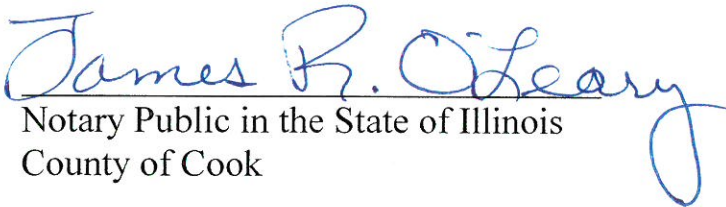
Print Name

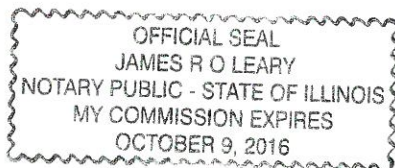
ACKNOWLEDGEMENT BY SURETY

STATE OF ILLINOIS
COUNTY OF COOK

On this 18th day of November, 2015 before me, James R. O'Leary, a Notary Public, within and for said County and State, personally appeared Sandra M. Winsted to me personally known to be the Attorney-in-Fact of and for Westchester Fire Insurance Company and acknowledged that she executed the said instrument as the free act and deed of said Company.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, at my office in the aforesaid County, the day and year in this certificate first above written.


Notary Public in the State of Illinois
County of Cook



Power of Attorney

Westchester Fire Insurance Company

Know all men by these presents: That WESTCHESTER FIRE INSURANCE COMPANY, a corporation of the Commonwealth of Pennsylvania pursuant to the following Resolution, adopted by the Board of Directors of the said Company on December 11, 2006, to wit:

"RESOLVED, that the following authorizations relate to the execution, for and on behalf of the Company, of bonds, undertakings, recognizances, contracts and other written commitments of the Company entered into the ordinary course of business (each a "Written Commitment"):

- (1) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise
- (2) Each duly appointed attorney-in-fact of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise, to the extent that such action is authorized by the grant of powers provided for in such persons written appointment as such attorney-in-fact
- (3) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized, for and on behalf of the Company, to appoint in writing any person the attorney-in-fact of the Company with full power and authority to execute, for and on behalf of the Company, under the seal of the Company or otherwise, such Written Commitments of the Company as may be specified in such written appointment, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments
- (4) Each of the Chairman, the President and Vice Presidents of the Company is hereby authorized, for and on behalf of the Company, to delegate in writing any other officer of the Company the authority to execute, for and on behalf of the Company, under the Company's seal or otherwise, such Written Commitments of the Company as are specified in such written delegation, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments
- (5) The signature of any officer or other person executing any Written Commitment or appointment or delegation pursuant to this Resolution, and the seal of the Company, may be affixed by facsimile on such Written Commitment or written appointment or delegation.

FURTHER RESOLVED, that the foregoing Resolution shall not be deemed to be an exclusive statement of the powers and authority of officers, employees and other persons to act for and on behalf of the Company, and such Resolution shall not limit or otherwise affect the exercise of any such power or authority otherwise validly granted or vested

Does hereby nominate, constitute and appoint Debra J Doyle, Diane M O'Leary, Jennifer L Jakaitis, Jessica B Yates, Judith A Lucky-Eftimov, Richard A Moore, Jr., Robert E Duncan, Sandra M Winsted, Sandra M Nowak, Susan A Welsh, Christina L. Sandoval, David J. Roth, Melissa L. Fortier all of the City of CHICAGO, Illinois, each individually if there be more than one named, its true and lawful attorney-in-fact, to make, execute, seal and deliver on its behalf, and as its act and deed any and all bonds, undertakings, recognizances, contracts and other writings in the nature thereof in penalties not exceeding Twenty Five Million Dollars & Zero Cents (\$25,000,000.00) and the execution of such writings in pursuance of these presents shall be as binding upon said Company, as fully and amply as if they had been duly executed and acknowledged by the regularly elected officers of the Company at its principal office,

IN WITNESS WHEREOF, the said Stephen M. Haney, Vice-President, has hereunto subscribed his name and affixed the Corporate seal of the said WESTCHESTER FIRE INSURANCE COMPANY this 17th day of October, 2014.

WESTCHESTER FIRE INSURANCE COMPANY



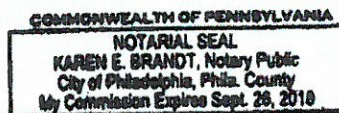
Stephen M. Haney

Stephen M. Haney, Vice President

COMMONWEALTH OF PENNSYLVANIA
COUNTY OF PHILADELPHIA ss.

On this 17th day of October, AD. 2014 before me, a Notary Public of the Commonwealth of Pennsylvania in and for the County of Philadelphia came Stephen M. Haney, Vice-President of the WESTCHESTER FIRE INSURANCE COMPANY to me personally known to be the individual and officer who executed the preceding instrument, and he acknowledged that he executed the same, and that the seal affixed to the preceding instrument is the corporate seal of said Company; that the said corporate seal and his signature were duly affixed by the authority and direction of the said corporation, and that Resolution, adopted by the Board of Directors of said Company, referred to in the preceding instrument, is now in force.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal at the City of Philadelphia the day and year first above written.



Karen E. Brandt
Notary Public

I, the undersigned Assistant Secretary of the WESTCHESTER FIRE INSURANCE COMPANY, do hereby certify that the original POWER OF ATTORNEY, of which the foregoing is a substantially true and correct copy, is in full force and effect.

In witness whereof, I have hereunto subscribed my name as Assistant Secretary, and affixed the corporate seal of the Corporation, this 18th day of November 20 15



William L. Kelly
William L. Kelly, Assistant Secretary

THIS POWER OF ATTORNEY MAY NOT BE USED TO EXECUTE ANY BOND WITH AN INCEPTION DATE AFTER OCTOBER 17TH, 2016

DocuGard #04546 contains a security pantograph, blue background, heat-sensitive ink, coin-reactive watermark, and microtext printing on border.



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CERTIFICATE OF LIABILITY INSURANCE

DATE(MM/DD/YYYY)
11/04/2015

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Aon Risk Services Central, Inc. Chicago IL Office 200 East Randolph Chicago IL 60601 USA	CONTACT NAME:	
	PHONE (A/C. No. Ext): (866) 283-7122	FAX (A/C. No.): (800) 363-0105
E-MAIL ADDRESS:		
INSURER(S) AFFORDING COVERAGE		NAIC #
INSURED Motorola Solutions, Inc. Attn Karen Napier 1303 East Algonquin Road Schaumburg IL 60196 USA	INSURER A: Liberty Mutual Fire Ins Co	
	INSURER B: Liberty Insurance Corporation	
	INSURER C:	
	INSURER D:	
	INSURER E:	
	INSURER F:	

Holder Identifier :

COVERAGES

CERTIFICATE NUMBER: 570060029274

REVISION NUMBER:

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.

Limits shown are as requested

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC OTHER:	Y		TB2641005169075	07/01/2015	07/01/2016	EACH OCCURRENCE \$2,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$250,000 MED EXP (Any one person) \$10,000 PERSONAL & ADV INJURY \$2,000,000 GENERAL AGGREGATE \$3,000,000 PRODUCTS - COMP/OP AGG \$2,000,000
A	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS <input type="checkbox"/> NON-OWNED AUTOS	Y		AS2-641-005169-015	07/01/2015	07/01/2016	COMBINED SINGLE LIMIT (Ea accident) \$1,000,000 BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)
	UMBRELLA LIAB <input type="checkbox"/> OCCUR EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED <input type="checkbox"/> RETENTION						EACH OCCURRENCE AGGREGATE
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR / PARTNER / EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N N	Y	WA764D005169085 All other States WC7641005169095 WI	07/01/2015	07/01/2016	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$1,000,000 E.L. DISEASE-EA EMPLOYEE \$1,000,000 E.L. DISEASE-POLICY LIMIT \$1,000,000
B		N/A	Y		07/01/2015	07/01/2016	

Certificate No : 570060029274

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

Re: APCP P25 Trunked Simulcast County Wide Public Safety Radio system. Project #-14212. Palm Beach County, a political subdivision of the State of Florida, its officers and employees are included as Additional Insured with respect to the General Liability and Automobile Liability policies per written agreement. Waiver of Subrogation is provided under the workers Compensation policy per written agreement.

CERTIFICATE HOLDER

CANCELLATION

Palm Beach County c/o Insurance Tracking Services, Inc. (ITS) P.O. Box 20270 Long Beach CA 90801 USA	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 <i>Aon Risk Services Central, Inc.</i>

APPENDIX G – MAINTENANCE TERMS AND CONDITIONS

Maintenance Terms and Conditions

Motorola Solutions, Inc. (“Motorola”) and Palm Beach County (“Customer”) hereby agree as follows:

Section 1 APPLICABILITY

These Maintenance Terms and Conditions apply to service contracts whereby Motorola will provide to Customer either (1) maintenance, support, or other services under a Motorola Service Agreement, or (2) installation services under a Motorola Installation Agreement.

Section 2 DEFINITIONS AND INTERPRETATION

2.1. “Agreement” means these Maintenance Terms and Conditions; the cover page for the Service Agreement or the Installation Agreement, as applicable; and any other attachments, all of which are incorporated herein by this reference. In interpreting this Agreement and resolving any ambiguities, these Service Terms and Conditions take precedence over any cover page, and the cover page takes precedence over any attachments, unless the cover page or attachment states otherwise.

2.2. “Equipment” means the equipment that is specified in the Primary Contract or is subsequently added to this Agreement.

2.3. “Primary Contract” means the Project No. 14212 Contract to which this Appendix is attached.

2.4. “Services” means those installation, maintenance, support, training, and other services described in this Agreement.

Section 3 ACCEPTANCE

Customer accepts these Maintenance Terms and Conditions and agrees to pay the prices set forth in this Agreement. The services identified in this Agreement will begin at the end of the Warranty Period (Year 2) set forth in the Primary Contract, and will continue for fifteen (15) years for a total term of sixteen (16) years (“Effective Term”).

Section 4 SCOPE OF SERVICES

4.1. Motorola will provide the Services described in this Agreement or in a more detailed statement of work or other document attached to this Agreement. At Customer’s request, Motorola may also provide additional services at Motorola’s then-applicable rates for the services.

4.2. If Motorola is providing Services for Equipment, Motorola parts or parts of equal quality will be used; the Equipment will be serviced at levels set forth in the manufacturer’s product manuals; and routine service procedures that are prescribed by Motorola will be followed.

4.3. If Customer purchases from Motorola additional equipment that becomes part of the same system as the initial Equipment, the additional equipment may be added to this Agreement and will be billed at the applicable rates after the warranty for that additional equipment expires.

4.4. All Equipment must be in good working order on the Start Date or when additional equipment is added to the Agreement. Upon reasonable request by Motorola, Customer will provide a complete serial

and model number list of the Equipment. Customer must promptly notify Motorola in writing when any Equipment is lost, damaged, stolen or taken out of service. Customer's obligation to pay Service fees for this Equipment will terminate at the end of the month in which Motorola receives the written notice.

4.5. Customer must specifically identify any Equipment that is labeled intrinsically safe for use in hazardous environments.

4.6. Following Motorola's issuance of an End of Life (EOL) for Motorola manufactured subscriber equipment or Motorola manufactured fixed infrastructure equipment, **exclusive of third party IT equipment (e.g. computers, switches, etc.), Motorola will provide parts and repair service for five (5) years and seven (7) years, respectively.** Following the applicable timeframe, if the equipment serviced under this Appendix cannot, in Motorola's reasonable opinion, be properly or economically serviced for any reason, Motorola may modify the scope of Services related to that Equipment; remove that Equipment from the Agreement; or increase the price to Service that Equipment. The County's Lifecycle Agreement (Appendix H of the Primary Contract) will extend the serviceability of the System's hardware components via periodic technology refresh as described in the Lifecycle Statement of Work (Schedule A to Appendix H of the Primary Contract).

4.7. Customer must promptly notify Motorola of any Equipment failure. Motorola will respond to Customer's notification in a manner consistent with the level of Service purchased as indicated in this Agreement.

Section 5 EXCLUDED SERVICES

5.1. Service excludes the repair or replacement of Equipment that has become defective or damaged from use in other than the normal, customary, intended, and authorized manner; use not in compliance with applicable industry standards; excessive wear and tear; or accident, liquids, power surges, neglect, acts of God or other force majeure events.

5.2. Unless specifically included in this Agreement, Service excludes items that are consumed in the normal operation of the Equipment, such as batteries or magnetic tapes.; upgrading or reprogramming Equipment; accessories, belt clips, battery chargers, custom or special products, modified units, or software; and repair or maintenance of any transmission line, antenna, microwave equipment, tower or tower lighting, duplexer, combiner, or multicoupler. Motorola has no obligations for any transmission medium, such as telephone lines, computer networks, the internet or the worldwide web, or for Equipment malfunction caused by the transmission medium.

Section 6 TIME AND PLACE OF SERVICE

Service will be provided at the location specified in this Agreement. When Motorola performs service at Customer's location, Customer will provide Motorola, at no charge, a non-hazardous work environment with adequate shelter, heat, light, and power and with full and free access to the Equipment. Waivers of liability from Motorola or its subcontractors will not be imposed as a site access requirement. Customer will provide all information pertaining to the hardware and software elements of any system with which the Equipment is interfacing so that Motorola may perform its Services. Unless otherwise stated in this Agreement, the hours of Service will be 8:30 a.m. to 4:30 p.m., local time, excluding weekends and holidays. Unless otherwise stated in this Agreement, the price for the Services exclude any charges or expenses associated with helicopter or other unusual access requirements; if these charges or expenses are reasonably incurred by Motorola in rendering the Services, Customer agrees to reimburse Motorola for those charges and expenses.

Section 7 CUSTOMER CONTACT

Customer will provide Motorola with designated points of contact (list of names and phone numbers) that will be available twenty-four (24) hours per day, seven (7) days per week, and an escalation procedure to enable Customer's personnel to maintain contact, as needed, with Motorola.

Section 8 PAYMENT

Motorola will invoice Customer in advance, on a monthly basis, 1/12th of the total annual cost of services described in Schedule B to this Appendix. All other charges will be billed monthly, and Customer must pay each invoice in U.S. dollars in 45 days of receipt of the invoice date in accordance with the Florida Prompt Pay Act. Customer will reimburse Motorola for all property taxes, sales and use taxes, excise taxes, and other taxes or assessments that are levied as a result of Services rendered under this Agreement (except income, profit, and franchise taxes of Motorola) by any governmental entity.

Section 9 WARRANTY

Motorola warrants that its Services under this Agreement will be free of defects in materials and workmanship for a period of ninety (90) days from the date the performance of the Services are completed. In the event of a breach of this warranty, Customer's sole remedy is to require Motorola to re-perform the non-conforming Service or to refund, on a pro-rata basis, the fees paid for the non-conforming Service. MOTOROLA DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Section 10 DEFAULT/TERMINATION

10.1. If either party defaults in the performance of this Agreement, the other party will give to the non-performing party a written and detailed notice of the default. The non-performing party will have thirty (30) days thereafter to provide a written plan to cure the default that is acceptable to the other party and begin implementing the cure plan immediately after plan approval. If the non-performing party fails to provide or implement the cure plan, then the injured party, in addition to any other rights available to it under law, may immediately terminate this Agreement effective upon giving a written notice of termination to the defaulting party.

10.2. Any termination of this Agreement will not relieve either party of obligations previously incurred pursuant to this Agreement, including payments which may be due and owing at the time of termination. All sums owed by Customer to Motorola for Services provided will become due and payable immediately upon termination of this Agreement. Upon the effective date of termination, Motorola will have no further obligation to provide Services.

Section 11 LIMITATION OF LIABILITY

Except for personal injury, death, or damage to tangible property, Motorola's total liability, whether for breach of contract, warranty, negligence, strict liability in tort, or otherwise, will be limited to the direct damages recoverable under law, but not to exceed the price of twelve (12) months of Service provided under this Agreement. ALTHOUGH THE PARTIES ACKNOWLEDGE THE POSSIBILITY OF SUCH LOSSES OR DAMAGES, THEY AGREE THAT MOTOROLA WILL NOT BE LIABLE FOR ANY COMMERCIAL LOSS; INCONVENIENCE; LOSS OF USE, TIME, DATA, GOOD WILL, REVENUES, PROFITS OR SAVINGS; OR OTHER SPECIAL, INCIDENTAL, INDIRECT, OR CONSEQUENTIAL DAMAGES IN ANY WAY RELATED TO OR ARISING FROM THIS

AGREEMENT OR THE PERFORMANCE OF SERVICES BY MOTOROLA PURSUANT TO THIS AGREEMENT. No action for contract breach or otherwise relating to the transactions contemplated by this Agreement may be brought more than one (1) year after the accrual of the cause of action, except for money due upon an open account. This limitation of liability will survive the expiration or termination of this Agreement and applies notwithstanding any contrary provision.

Section 12 EXCLUSIVE TERMS AND CONDITIONS

12.1. This Agreement supersedes all prior and concurrent agreements and understandings between the parties, whether written or oral, related to the Services, and there are no agreements or representations concerning the subject matter of this Agreement except for those expressed herein. The Agreement may not be amended or modified except by a written agreement signed by authorized representatives of both parties.

12.2. Customer agrees to reference this Agreement on any purchase order issued in furtherance of this Agreement, however, an omission of the reference to this Agreement will not affect its applicability. In no event will either party be bound by any terms contained in a Customer purchase order, acknowledgement, or other writings unless: the purchase order, acknowledgement, or other writing specifically refers to this Agreement; clearly indicate the intention of both parties to override and modify this Agreement; and the purchase order, acknowledgement, or other writing is signed by authorized representatives of both parties.

Section 13 PROPRIETARY INFORMATION; CONFIDENTIALITY; INTELLECTUAL PROPERTY RIGHTS

13.1. Any information or data in the form of specifications, drawings, reprints, technical information or otherwise furnished to Customer under this Agreement will remain Motorola's property, will be deemed proprietary, will be kept confidential, and will be promptly returned at Motorola's request. Customer may not disclose, without Motorola's written permission or as required by law, any confidential information or data to any person, or use confidential information or data for any purpose other than performing its obligations under this Agreement. The obligations set forth in this Section survive the expiration or termination of this Agreement.

13.2. Unless otherwise agreed in writing, no commercial or technical information disclosed in any manner or at any time by Customer to Motorola will be deemed secret or confidential. Motorola will have no obligation to provide Customer with access to its confidential and proprietary information, including cost and pricing data.

13.3. This Agreement does not grant directly or by implication, estoppel, or otherwise, any ownership right or license under any Motorola patent, copyright, trade secret, or other intellectual property, including any intellectual property created as a result of or related to the Equipment sold or Services performed under this Agreement.

Section 14 FCC LICENSES AND OTHER AUTHORIZATIONS

Customer is solely responsible for obtaining licenses or other authorizations required by the Federal Communications Commission or any other federal, state, or local government agency and for complying with all rules and regulations required by governmental agencies. Neither Motorola nor any of its employees is an agent or representative of Customer in any governmental matters.

Section 15 INTENTIONALLY LEFT BLANK

Section 16 MATERIALS, TOOLS AND EQUIPMENT

All tools, equipment, dies, gauges, models, drawings or other materials paid for or furnished by Motorola for the purpose of this Agreement will be and remain the sole property of Motorola. Customer will safeguard all such property while it is in Customer's custody or control, be liable for any loss or damage to this property, and return it to Motorola upon request. This property will be held by Customer for Motorola's use without charge and may be removed from Customer's premises by Motorola at any time without restriction.

Section 17 GENERAL TERMS

17.1. If any court renders any portion of this Agreement unenforceable, the remaining terms will continue in full force and effect.

17.2. This Agreement and the rights and duties of the parties will be interpreted in accordance with the laws of the State in which the Services are performed.

17.3. Failure to exercise any right will not operate as a waiver of that right, power, or privilege.

17.4. Neither party is liable for delays or lack of performance resulting from any causes that are beyond that party's reasonable control, such as strikes, material shortages, or acts of God.

17.5. Motorola may subcontract any of the work, but subcontracting will not relieve Motorola of its duties under this Agreement.

17.6. Except as provided herein, neither Party may assign this Agreement or any of its rights or obligations hereunder without the prior written consent of the other Party, which consent will not be unreasonably withheld. Any attempted assignment, delegation, or transfer without the necessary consent will be void. Notwithstanding the foregoing, Motorola may assign this Agreement to any of its affiliates or its right to receive payment without the prior consent of Customer. In addition, in the event Motorola separates one or more of its businesses (each a "Separated Business"), whether by way of a sale, establishment of a joint venture, spin-off or otherwise (each a "Separation Event"), Motorola may, without the prior written consent of the other Party and at no additional cost to Motorola, assign this Agreement such that it will continue to benefit the Separated Business and its affiliates (and Motorola and its affiliates, to the extent applicable) following the Separation Event.

17.7. Motorola understands that this Agreement constitutes an annual agreement whereby the County will annually issue Motorola a purchase order for a twelve (12)-month period, prior to each anniversary of the Effective Term. With no less than ninety (90) days' notice, the County may notify Motorola in writing of its intention to terminate the Agreement for convenience. With five (5) days' notice, the County may also terminate this agreement in the event the annual budgetary process results in the non-appropriation of funds for this purpose. The County will pay Motorola for all services performed up to the effective date of termination.

17.8. If the Customer elects to purchase and annually renew the agreements set forth in Appendix G and Appendix H of the Primary Agreement for fifteen (15) consecutive years from the Start Date, Section 4.6 above will not apply during the fifteen-year Term.

17.9 ORDER OF PRECEDENCE. In the event of inconsistencies between this Appendix and the Primary Contract, the parties agree that this Appendix prevails, only with respect to the specific subject matter of this Appendix.

SCHEDULE A – MAINTENANCE STATEMENT OF WORK

Section 1. Dispatch Service

Description of Services

The Call Center Operation (CCO) at Motorola's System Support Center (SSC) provides continuously, a central point of contact for technical customer service requests. The CCO is staffed with customer support representatives who will coordinate the appropriate service response and resources. Service requests are tracked and monitored from creation to close through an electronic case tracking process to which each request is assigned a Case Number.

Motorola has the following responsibilities:

- Monitor the County's system with UEM via the Network Management Client.
- Continuously receive technical service requests from Customer or Motorola via telephone.
- Open a Case and gather information from Customer to perform the following:
 - Characterize the issue
 - Determine a plan of action
 - Assign and track the Case to resolution.
- Dispatch a servicer as required by standard procedures and provide necessary Case information.
- Verify with Customer that restoration is complete or system is functional, if required by Customer's repair verification preference. If verification by Customer cannot be completed within 20 minutes of restoration, the Case will be closed and the servicer will be released.
- Ensure the required personnel have access to Customer information as needed.
- Escalate the Case to the appropriate party upon expiration of a Response time.
- Close the Case upon receiving notification from Customer or Servicer, indicating the Case is resolved.
- Notify Customer of Case status via pager or email Open and Close; or Open, Assigned, Arrival, Deferred, Closed.
- Provide periodic activity reports to Customer.

Customer has the following responsibilities:

- Provide Motorola with the following pre-defined information prior to service Start Date:
 - Case notification preferences
 - Repair verification preference
- Call the SSC provide the following information to the customer support representative:
 - Assigned System ID number
 - Problem description and site location
 - Other pertinent information for Motorola to open a Case.
- Verify with the SSC that Restoration is complete or System is functional, if required by Customer's repair verification preference.
- Complete and submit all required database and escalation procedure forms to be entered and stored at the System Support Center.
- Submit changes in any information supplied in the Customer Support Plan to the Customer Support Manager.
- Cooperate with Motorola and perform all acts that are reasonable or necessary to enable Motorola to provide the Dispatch Service to Customer.

Section 2. Technical Support Service

Description of Services

The Technical Support Operation at Motorola's SSC provides to Customer's technical staff centralized remote telephone support for technical issues that require a high level of communications systems expertise or troubleshooting on the Equipment. The Technical Support Operation is staffed with technologists who specialize in the diagnosis and resolution of system performance issues. Technical Support Service (i) shall not include software upgrades that may be required for issue resolution; and (ii) is only available for those system types supported and approved by Technical Support Operations, and (iii) is not available to provide Customer training via the telephone.

Motorola has the following responsibilities:

- Provide Technical Support Operation availability for all Severity One issues continuously.
- Respond to requests for the Restoration of failed Systems and to diagnose operation-affecting problems in accordance with the Response times defined in Table A and Severity Levels defined in Table B in Appendix 1 at the back of this Statement of Work.
- Advise caller with procedure for determining any additional requirements for issue characterization, Restoration, or known fix for issue resolution.
- Attempt remote access to System for remote diagnostics, if possible.
- As needed, coordinate with the Servicer or Customer in the field until close of the Case.
- Coordinate technical resolutions with agreed upon third party vendor(s), as needed.
- Escalate support issues to Motorola engineering and product groups, if necessary.
- Provide a focal point for any Systemic issue and manage the Systemic issue to resolution.
- Escalate the Case to the appropriate party upon expiration of a Response time.
- Provide remote assistance, if needed to install an Enhancement Release provided pursuant to the Software Maintenance Agreement.
- Provide Configuration Change Support and Work Flow changes to Systems that have dial in capability.

Customer has the following responsibilities:

- Complete and submit all required database and escalation procedure forms to be entered and stored at the System Support Center prior to Start Date.
- Submit changes in any information supplied in the above documents to the Customer Support Manager prior to the change taking effect.
- Contact the System Support Center in order to access the Technical Support Operation, provide name of caller, name of Customer, System ID number, Service Agreement number, site(s) in questions, and brief description of the problem.
- Supply on-site presence when requested by System Support Center.
- Validate issue resolution prior to close of the Case.
- Allow Motorola remote access to the System.
- Cooperate with Motorola and perform all acts that are reasonable or necessary to enable Motorola to provide the Technical Support services to Customer.
- Acknowledge that Cases will be handled in accordance with the times and priorities as defined in Table A and B in Appendix 1 at the back of this SOW.

Section 3. Infrastructure Repair

Description of Services

Infrastructure Repair provides repair service to Motorola and select third party Infrastructure as set forth in the applicable attached Exhibit. Equipment is serviced down to the component level at the Motorola System Support Center (SSC). At Motorola's discretion, select third party Infrastructure may be sent to the original equipment manufacturer or third party vendor for repair. If third party Infrastructure is no longer supported by the original equipment manufacturer, Motorola may replace Equipment with a comparable/compatible or like Equipment, when possible. Additional descriptions are provided in the box at the end of this section.

Motorola has the following responsibilities:

- Receive Equipment from Customer and document its arrival, repair and return. Provide return authorization numbers when requested
- Perform the following on Motorola Equipment:
 - Perform an operational check on the Equipment to determine the nature of the problem.
 - Replace malfunctioning Components with new or reconditioned assemblies.
 - Verify that Motorola Equipment is returned to Motorola manufactured specifications, as applicable.
 - Perform a Box Unit Test on all serviced Equipment.
 - Perform a System Test on select Equipment.
- Provide service on third party Infrastructure
- Perform pre-diagnostic and repair services on select third party Infrastructure to confirm Equipment malfunction and eliminate sending Equipment with no trouble found (NTF) to third party vendor for repair, when applicable.
- Ship select third party Infrastructure to the original equipment manufacturer or third party vendor for repair service.
- Coordinate and track third-party Infrastructure Equipment sent to the original equipment manufacturer or third party vendor for service.
- Perform a post-test to confirm malfunction Equipment has been repaired and functions properly in a Motorola System configuration, when applicable.
- Reprogram Equipment to return Equipment to original operating parameters based on templates downloaded by service technician prior to shipment for repair.
- Properly package and return ship (Motorola will pay return shipping charges) Equipment to the Customer specified address.

Customer has the following responsibilities:

- Maintain templates of Software/applications and Firmware for reloading of Equipment.
- Cooperate with Motorola and perform all acts that are reasonable or necessary to enable Motorola to provide the Infrastructure Repair services to Customer.

Motorola has the following responsibilities:

- Contact the SSC for a return authorization number prior to shipping malfunctioning Equipment or third party Infrastructure named in Table A below. The initial call to the SSC may be from

Servicer if, pursuant to a Statement of Work or other applicable Agreement, Servicer is acting on Customer's behalf.

- Provide model description, model number, and serial number, type of System and Firmware version, symptom of problem and address of site location for FRU or Equipment.
- Indicate if the Equipment or third party Infrastructure being sent in for service was subjected to physical damage or lightning damage. Follow Motorola instructions regarding inclusion or removal of Firmware and Software applications from Equipment being sent in for service.

Coverage and Exclusions for Infrastructure Repair

Table A – Coverage and Exclusions for Infrastructure Repair

Astro 25 Infrastructure Equipment	Notes/ Exceptions
Antenna Systems	Excludes all equipment such as bi-directional amplifiers, multicoupler, combiners, tower top pre-amplifiers, antennas, cables, towers, tower lighting, and transmission lines.
Base Station(s) and Repeater(s)	Includes: GTR8000, Quantars
Central Electronics Bank(s)	Includes Logging Recorder Interface and Network Hub.
Channel Bank(s)	Includes Premisys and Telco, Excludes Siemens
Comparator(s)	Includes GMC8000 Comparators and AstroTAC and DigiTAC.
Computer(s)	Includes computers that directly interface with or control the communications System, including Systemwatch II, HPx2100, HP xw4000-4600, HPz400, HP VL600, HP VL800, HPz400, Compaq XW4000. Excludes all laptops and other desktop computer technologies and all 286, 386, and 486 computers. Excludes mice and trackballs, unless unique to the product. Excludes defective or phosphor-burned cathode ray tubes CRT(s) and burned-in flat panel display image retention.
Console(s)	Includes consoles as part of complete System only. MCC7500, VPM including headset jacks, dual footswitches, and gooseneck microphones. Excludes cables.
Embassy Switch	Includes AEB, AIMI, ZAMBI
Management Terminals	Includes computers (Pentium I, II, III, and IV) that directly interface with or control the communications system. Excludes laptop computers and all 286, 386 and 486 computers.
Microwave System	Includes all Aviat Microwave radios and system sub-assemblies, microwave DC power supplies, loop switches, maintenance of stationary Microwave Batteries, dehydrators, & Provision Network Management System.
Monitor(s)	Includes all Motorola certified monitors connected to the computers that directly interface with or control the communications system. Excludes defective or phosphor-burned cathode ray tubes CRT(s) and burned-in flat panel display image retention. Monitors not shipped by Motorola and / or cannot be confirmed by a Motorola Factory Order number.
Moscad	Includes NFM (Network Fault Management) as part of System only. Standalone MOSCAD must be quoted separately. Excludes System Control and Data Acquisition (SCADA) MOSCAD Systems, and all other fire alarming systems.
Network Fault Management	Includes Full Vision, Unified Event Manager. Excludes NMC
Printer(s)	Includes printers that directly interface with the communications System. Excludes consumable items such as printer cartridges.
RAS(s)	Excludes RAS 1101, RAS 1102 and RAS 1100
Receiver(s)	Includes GPW8000, GTR8000 and GTR8000 HPD Receivers.
Site Frequency Standard(s)	Includes Rubidium, GPS and Netclocks systems sold with the Motorola System.
Zone Controller(s)	Includes terminals and servers.

Additional Exclusions for Infrastructure Repair:

- All Equipment over seven (7) years from product cancellation date.
- Physically damaged Equipment.
- Third party equipment not shipped by Motorola with the original System.
- Dictaphones and Recording Equipment.
- Consumable items including but not limited to subscriber batteries, connectors, printer cartridges, mice, and trackballs.
- Test Equipment.
- Racks, furniture and cabinets.
- Firmware upgrades.

Section 4. Network Monitoring Service

Description of Services

Network Monitoring Service electronically monitors specific elements of the System for Events. When an Event is detected, it is forwarded to the Motorola System Support Center using system specific monitoring tools. The System Support Center is staffed with trained technologists, who acknowledge the Event, run available diagnostic routines, and initiate an appropriate response.

Motorola has the following responsibilities:

- Recommend and coordinate installation of any needed connectivity or monitoring equipment.
- Verify connections and Event monitoring prior to System Acceptance or Start Date.
- Monitor System Continuously.
- Access the Customer's System to perform remote diagnostics.
- Create a Case when action is required.
- Disable and enable System devices as needed for Servicers who go to the Customer's site when intervention is needed.
- Verify service of Event as needed.
- Provide activity reports to Customer on Case history.
- Provide Performance Reports for SmartZone System.
- Provide dedicated connectivity with sufficient bandwidth necessary for monitoring the County System.

Customer has the following responsibilities:

- Allow Motorola remote access continuously to obtain System performance data.
- Notify the System Support Center when Customer performs any activity that impacts the System. (Activity that impacts the System may include, but is not limited to, installing software or hardware upgrades, performing upgrades to the network, or taking down part of the system to perform maintenance.)
- Allow Servicers access to Equipment (including any connectivity or monitoring equipment) if remote service is not possible.
- Cooperate with Motorola and perform all acts that are reasonable or necessary to enable Motorola to provide the Network Monitoring Service to Customer.

Section 5. OnSite Infrastructure Response

Description of Service

OnSite Infrastructure Response provides for on-site technician Response as determined by the pre-defined severity levels set forth in Table C below. The response time to each severity level is shown in Table B below.

Motorola has the following responsibilities:

- Perform diagnostics on the Component/Field Replaceable Unit (FRU) /assembly
- Restore the System by replacing defective Component/FRU/assembly:
- Provide materials, tools, documentation, physical planning manuals, diagnostic and test equipment necessary to perform the Maintenance service.

Customer has the following responsibilities:

- Establish and maintain a suitable environment for the Equipment and provide the Servicer full, free, and safe access to the Equipment so that the Servicer may provide Maintenance services.
- Provide the FRU and assembly from the County's spares inventory or through advanced replacement.
- Maintain and store any and all Software needed to restore the System.
- Cooperate with Motorola and perform all acts that are reasonable or necessary to enable Motorola to provide the OnSite Infrastructure Response services to Customer.

TABLE B – Response Times

SEVERITY	RESPONSE
Severity 1	Within 1 Hour from receipt of notification, 7x24x365+
Severity 2*	Within 2 Hours from receipt of notification during standard business days
Severity 3*	Within next Business Day

*Standard Business Days

TABLE C – Severity Definitions

SEVERITY LEVEL	Problem Types
Severity 1	Major system failure One or more of RF sites off-line 25% or more of the system talkpaths off-line Failure of any console operator position
Severity 2	Loss of ISSI or any interoperability interface Significant system impairment 10% or more of the system talkpaths off-line Two (2) or more of the stand-by control channels off-line The loss of a logging recorder interface
Severity 3	Parts Questions Upgrades Intermittent problems System problems presently being monitored Operational and informational questions Configuration Change Support and Work Flow procedure questions

Section 6. Preventative Maintenance

Description of Service

Preventative Maintenance (PM) provides a review and documentation of the systems performance from each device in the network individually and as a whole. Motorola will provide trained personnel to perform PM on the Astro 25 Radio System at the tower site locations. Motorola will perform the PM in a manner that will have the least amount of impact to the user and will contact the County prior to disabling equipment that would significantly reduce the performance of the system. If Motorola discovers equipment that does not perform per the specifications or found inoperable, Motorola will replace and / or repair the equipment.

Motorola has the following responsibilities:

- Maintain a regular schedule to visit the sites for visual inspection at a minimum of one (1) time per month.
- Maintain a regular schedule to perform preventative maintenance at a minimum of six (6) month intervals. Preventative maintenance activities to include the following checks on the system and adjust the equipment as required:
 - 10 Hz Mod. Comp. Simulcast Tests
 - Over the Air Transmit and Receive Tests.
 - Microwave PM and RX and TX level tests
 - RF Site Documentation to include:
 - Repeater TX and RX performance (TX power, RX sensitivity, Audio levels).
 - Combiner and Band Pass Filter losses.
 - Voter performance

County has the following responsibilities:

- Review and comment on the PM documents supplied by Motorola
- Supply on-site presence when requested
- Supply tower climbers when required to investigate any questionable problems with the antenna system and to have available the spare parts that were purchased with the original system.

Section 7. Disaster Recovery

In the event of a natural disaster there is a possibility that some of the Palm Beach County Astro 25 System will be inoperable. Because this is a public safety system, the County is required to maintain the system for the users and provide for disaster recovery should an incident damage one or more towers in the system.

Motorola has the following responsibilities:

- Availability of two (2) technicians for assignment to locations designated by the County in advance of hurricane events.
- Provide a minimum of three (3) technicians and one (1) technical manager during the restoration phase.
- Respond to site(s) to evaluate damage and begin restoration operations within 4 hours of access being established, or within 4 hours after County declares all clear notification, whichever comes first.
- Provide materials, tools, documentation, physical planning manuals, diagnostic and test equipment necessary to provide restoration.
- Provide technical services to troubleshoot and repair the County's system and to work with County personnel and contractors during the restoration phase.
- Monitor the system at the Network Monitoring Center and provide the on-call Motorola technicians with system updates.
- Motorola will charge the County the agreed price as stated in the current Price Agreement between the County and Motorola.

County has the following responsibilities:

- Supply on-site presence at the tower sites.
- Supply tower climbers when required to investigate any questionable problems or repair the antenna systems.
- Supply spare antenna components for the tower sites.
- Have available the spare parts which were purchased with the original system, unless previously used by Motorola.

Section 8 Security Update Service

Terms that are capitalized but not defined in this Statement of Work shall have the definition given to such terms in the Service Terms and Conditions, the Communications System Agreement or other applicable agreement. The following terms have the following meanings:

- Non-Motorola Software: Software whose copyright is owned by a party other than Motorola or its affiliated company, including but not limited to the anti-virus definitions, operating system software patches and signature files that will be pre-tested pursuant to this Statement of Work.

- System: The currently shipping Motorola ASTRO® 25 System Release and up to 5 releases prior.
- Supported Release: Security Update Service is available on the currently shipping Motorola ASTRO® 25 System Release and up to 5 releases prior. If a customer is on a System Release outside of the N-5 release schedule, then they cannot purchase this service.

Description of Services

- With Security Update Service (“Service”), Motorola pretests the updated commercial anti-virus definitions for the Microsoft Windows based boxes on a System. This Service includes Motorola obtaining Microsoft Security Updates for Windows operating system, Solaris recommended patch bundles, Red Hat Linux security patches, anti-virus definitions* and intrusion detection sensor updates for Motorola supplied equipment from applicable original equipment manufacturer (OEM).
- Motorola will evaluate and pre-test each update on Motorola’s ASTRO 25 test System components for operational impact. Motorola’s verification and evaluation process for anti-virus definitions will consist of applying each update to an appropriate ASTRO 25 system release that corresponds and is consistent with supported** and fielded systems.
- Each assessment will consist of no less than 36 hours of examination time to evaluate the impact each anti-virus update has to the system. Upon successful completion of the assessment pertaining to anti-virus signatures, these updates will be provided on a weekly basis either automatically or through connecting to Motorola’s secured extranet connection. When anti-virus definitions classified as Category 4 (Severe, difficult to contain) and Category 5 (Very Severe, very difficult to contain) by the commercial supplier are released, Motorola will determine if a high-priority release is necessary. Operating system updates/patches will be made available to our customers electronically upon successful testing in our lab environments on a monthly basis for Microsoft patches and on a quarterly basis for all others.
- NOTICE: If a customer wants antivirus and IDS updates automatically deployed onto th\eir network, then they must purchase the Security Monitoring service. Otherwise, customers may download the updates from the secure extranet site and manually deploy them onto their network. Motorola will perform testing only on standard configurations certified by Motorola System Integration Testing (SIT) and Motorola supplied equipment/software prior to making an update available to Customers.
- - Not all systems are provided antivirus for Microsoft and UNIX platforms. To receive full antivirus support under this service offering, the customer must have a standard ASTRO 25 system that is supported and also has implemented antivirus for UNIX.
 - ** - Supported is defined as the current system release and the last five prior. Support beyond this model requires approval from the Customer Service Manager and the Security Services Product Manager. For extended coverage, please communicate a formal request to your account manager.

- The customer will be responsible for deploying Microsoft, Oracle, Sun Microsystems, UNIX, and Linux security updates from a Motorola provided secured extranet Web site. Antivirus and IDS updates will be capable of being pushed automatically to the customer ASTRO25 network only if the Security Monitoring service is purchased by the customer. If there is a recommended configuration change that is successfully tested on the ASTRO 25 test System, Motorola will provide detailed instructions for performing the configuration change.
- **Inclusions:** Security Update Service is available on the currently shipping Motorola ASTRO 25 System Release and up to 5 releases prior. If a customer is on a System Release outside of the N-5 release schedule, then they cannot purchase this service.
- **Exclusions:** Systems that have non-standard configurations that have not been certified by Motorola SIT are specifically excluded from this Service unless otherwise agreed in writing by Motorola. Service does not include pre-tested intrusion detection system (IDS) updates for IDS solutions not purchased through Motorola. NICE Recorder, certain consoles, MARVLIS, Symbol Equipment, AirDefense Equipment, AVL, and Radio Site Security products are also excluded. The scope of service coverage is defined by Motorola Services and is subject to change based on OEM support lifecycles.

SCHEDULE B – MAINTENANCE PRICING

Maintenance pricing is Section 1.16 of Appendix D of the Primary Contract.

APPENDIX H LIFECYCLE TERMS AND CONDITIONS

Customer will purchase and Motorola will sell the System Upgrade Services, as described below. Motorola and Customer may be referred to individually as a “Party” and collectively as the “Parties.” For good and valuable consideration, the Parties agree as follows.

Section 1 SCHEDULES

The Schedules listed below are incorporated into and made a part of this Appendix. In interpreting this Appendix and resolving any ambiguities, the main body of this Appendix takes precedence over the Schedules and any inconsistency between Schedules A through C will be resolved in their listed order.

Schedule A	Lifecycle Statement of Work
Schedule B	Lifecycle Pricing and Payment Schedule
Schedule C	Motorola Software License (Appendix B to the Primary Contract)

Section 2 DEFINITIONS AND INTERPRETATION

2.1. “Confidential Information” means all information consistent with the fulfillment of this Appendix that is (i) disclosed under this Appendix in oral, written, graphic, machine recognizable, and/or sample form, being clearly designated, labeled or marked as confidential or its equivalent or (ii) obtained by examination, testing or analysis of any hardware, software or any component part thereof provided by discloser to recipient. The nature and existence of this Appendix are considered Confidential Information. Confidential Information, that is disclosed orally must be identified as confidential at the time of disclosure and confirmed by the discloser by submitting a written document to the recipient within thirty (30) days after such disclosure. The written document must contain a summary of the Confidential Information disclosed with enough specificity for identification purpose and must be labeled or marked as confidential or its equivalent.

2.2. “Effective Date” means that date upon which the last Party executes this Appendix.

2.3. “Equipment” means the equipment that is specified in the attachments or is subsequently added to this Appendix.

2.4. “Order of Precedence”. In the event of inconsistencies between this Appendix and the Primary Contract, the parties agree that this Appendix prevails, only with respect to the specific subject matter of this Appendix.

2.4. “Software” means the Motorola Software and Non-Motorola Software, in object code format that is furnished with the System or Equipment, licensed pursuant to the terms of the Motorola Software License Appendix B.

2.5. “Services” mean those installations, support and other services described in this Appendix.

2.6. “System” means the system described in the contract documents for Project 14212 Trunked Simulcast Palm Beach County Wide Public Safety Radio System

2.7 “Primary Contract” means the Project No. 14212 Contract to which this Appendix is attached.

Section 3 ACCEPTANCE

Customer accepts and agrees to pay the prices set forth in this Appendix. The effective date of this Appendix begins on the Effective Date of the APCO P25 Trunked Simulcast Countywide Public Safety

Radio System (Project Number 14212).

Section 4 SCOPE OF SERVICES AND TERM

4.1. **SCOPE OF WORK.** Motorola will provide the Services described in this Appendix H and Appendix A. At Customer's request, Motorola may also provide additional services at Motorola's then-applicable rates for the services.

4.2. **SUBSTITUTIONS.** At no additional cost to Customer, Motorola may substitute any Equipment, Software, or Services to be provided by Motorola, if the substitute meets or exceeds the specifications described in Schedule A, and is of equivalent or better quality to the Customer. Any substitution will be reflected in a change order.

4.3. **TERM.** The term of this Appendix begins at the end of the Warranty Period set forth in the Primary Contract and extends for fifteen (15) years thereafter.

Section 5 APPENDIX PRICE, PAYMENT AND INVOICING

5.1. **APPENDIX PRICE.** The Appendix Price in U.S. dollars is \$3,275,227.00 (Appendix Price). The Appendix Price includes the Equipment, Software and Services provided under this Appendix, excluding applicable sales or similar taxes and freight charges. Motorola has priced the Equipment, Software, and Services as defined in the Schedules. Any change to the quantities or scope defined in the Schedules may affect the Appendix Price.

5.2. **INVOICING AND PAYMENT.** Motorola will submit invoices to Customer in advance of each payment period, according to Schedule B and Customer will make payments to Motorola within (30) days after the date of each invoice. Customer will make payments when due in the form of a wire transfer, check, or cashier's check from a U.S. financial institution. Overdue invoices will bear simple interest at the maximum allowable rate. For reference, the Federal Tax Identification Number for Motorola Solutions, Inc. is 36-1115800. Nothing herein shall be construed to modify any of the timeframes or other provisions of the Local Government Prompt Payment Act, Section 218.70 *et seq.*, Florida Statutes.

5.3. **FREIGHT, TITLE, AND RISK OF LOSS.** Motorola will pre-pay and add all freight charges to the invoices. Title to the Equipment will pass to Customer upon shipment. Title to Software will not pass to Customer at any time. Risk of loss will pass to Customer upon delivery of the Equipment to the Customer. Motorola will pack and ship all Equipment in accordance with good commercial practices.

Section 6 WARRANTY

6.1. **SERVICE WARRANTY.** Motorola warrants that its Services under this Appendix will be free of defects in materials and workmanship for a period of ninety (90) days from the date the performance of the Services are completed. In the event of a breach of this warranty, Customer's sole remedy is to require Motorola to re-perform the non-conforming Service or to refund, on a pro-rata basis, the fees paid for the non-conforming Service.

6.2. **EQUIPMENT WARRANTY.** Motorola warrants that the Equipment under normal use and service will be free from material defects in materials and workmanship for a period of ninety (90) days from the date of shipment.

6.3. **MOTOROLA SOFTWARE WARRANTY.** Motorola warrants the Motorola Software in accordance with the terms of the Software License Agreement (Appendix B to the Primary Contract) and

the provisions of this Section 6 that are applicable to the Motorola Software for a period of ninety (90) days from the date of successful installation of a software upgrade as described in this Appendix H.

6.4. **EXCLUSIONS TO EQUIPMENT AND MOTOROLA SOFTWARE WARRANTIES.** These warranties do not apply to: (i) defects or damage resulting from: use of the Equipment or Motorola Software in other than its normal, customary, and authorized manner; accident, liquids, neglect, or acts of God; testing, maintenance, disassembly, repair, installation, alteration, modification, or adjustment not provided or authorized in writing by Motorola; Customer's failure to comply with all applicable industry and OSHA standards; (ii) breakage of or damage to antennas unless caused directly by defects in material or workmanship; (iii) Equipment that has had the serial number removed or made illegible; (iv) batteries (because they carry their own separate limited warranty) or consumables; (v) freight costs to ship Equipment to the repair depot; (vi) scratches or other cosmetic damage to Equipment surfaces that does not affect the operation of the Equipment; and (vii) normal or customary wear and tear.

6.5. **WARRANTY CLAIMS.** To assert a warranty claim, Customer must notify Motorola in writing of the claim before the expiration of the Warranty Period. Upon receipt of this notice, Motorola will investigate the warranty claim. If this investigation confirms a valid warranty claim, Motorola will (at its option and at no additional charge to Customer) repair the defective Equipment or Motorola Software, replace it with the same or equivalent product, or refund the price of the defective Equipment or Motorola Software. That action will be the full extent of Motorola's liability for the warranty claim. If this investigation indicates the warranty claim is not valid, then Motorola may invoice Customer for responding to the claim on a time and materials basis using Motorola's then current labor rates. Repaired or replaced product is warranted for the balance of the original applicable warranty period. All replaced products or parts will become the property of Motorola.

6.6. **ORIGINAL END USER IS COVERED.** These express limited warranties are extended by Motorola to the original user purchasing the System for commercial, industrial, or governmental use only, and are not assignable or transferable.

6.7. **DISCLAIMER OF OTHER WARRANTIES. THESE WARRANTIES ARE THE COMPLETE WARRANTIES FOR THE EQUIPMENT AND MOTOROLA SOFTWARE PROVIDED UNDER THIS AGREEMENT AND ARE GIVEN IN LIEU OF ALL OTHER WARRANTIES. MOTOROLA DISCLAIMS ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

Section 7 EXCLUSIVE TERMS AND CONDITIONS

7.1 This Appendix supersedes all prior and concurrent agreements and understandings between the parties, whether written or oral, related to the Services, and there are no agreements or representations concerning the subject matter of this Appendix except for those expressed herein. This Appendix may not be amended or modified except by a written agreement signed by authorized representatives of both parties.

7.2 Customer agrees to reference this Appendix on any purchase order issued in furtherance of this Appendix, however, an omission of the reference to this Appendix will not affect its applicability. In no event will either party be bound by any terms contained in a Customer purchase order, acknowledgement, or other writings unless: the purchase order, acknowledgement, or other writing specifically refers to this Appendix; clearly indicate the intention of both parties to override and modify this Appendix; and the purchase order, acknowledgement, or other writing is signed by authorized representatives of both parties.

Section 8 CONFIDENTIALITY

8.1 Confidentiality Obligation. Each party is a disclosing party (“Discloser”) and a receiving party (“Recipient”) under this Appendix. During the term of this Appendix and for a period of three (3) years from the date of expiration or termination of this Appendix, recipient will (i) not disclose Confidential Information to any third party; (ii) restrict disclosure of Confidential Information to only those employees (including, but not limited to, employees of any wholly owned subsidiary, a parent company, any other wholly owned subsidiaries of the same parent company), agents or consultants who must be directly involved with the Confidential Information for the purpose and who are bound by confidentiality terms substantially similar to those in this Appendix; (iii) not reverse engineer, de-compile or disassemble any Confidential Information; (iv) use the same degree of care as for its own information of like importance, but at least use reasonable care, in safeguarding against disclosure of Confidential Information; (v) promptly notify discloser upon discovery of any unauthorized use or disclosure of the Confidential Information and take reasonable steps to regain possession of the Confidential Information and prevent further unauthorized actions or other breach of this Appendix; and (vi) only use the Confidential Information as needed to fulfill this Appendix.

8.2. Required Disclosure. If a recipient is required to disclose Confidential Information pursuant to applicable law, statute, or regulation, or court order, the recipient will give to the discloser prompt written notice of the request and a reasonable opportunity to object to such disclosure and seek a protective order or appropriate remedy. If, in the absence of a protective order, the recipient determines, upon the advice of counsel, that it is required to disclose such information, it may disclose only Confidential Information specifically required and only to the extent required to do so. Motorola will comply with Florida Statute Ch. 119, will seek protection from disclosure pursuant to this Chapter, within the timeframes specified therein, including the specified defenses therein, at Motorola’s expense.

8.3. Confidential Exceptions. Recipient is not obligated to maintain as confidential, Confidential Information that recipient can demonstrate by documentation (i) is now available or becomes available to the public without breach of this Appendix; (ii) is explicitly approved for release by written authorization of discloser; (iii) is lawfully obtained from a third party or parties without a duty of confidentiality; (iv) is known to the recipient prior to such disclosure; or (v) is independently developed by recipient without the use of any discloser’s Confidential Information or any breach of this Appendix.

8.4. Ownership and Retention. All Confidential Information remains the property of the discloser and will not be copied or reproduced without the express written permission of the discloser, except for copies that are absolutely necessary in order to fulfill this Appendix. Within ten (10) days of receipt of discloser’s written request, recipient will return all Confidential Information to discloser along with all copies and portions thereof, or certify in writing that all such Confidential Information has been destroyed. However, recipient may retain one (1) archival copy of the Confidential Information that it may use only in case of a dispute concerning this Appendix. No license, express or implied, in the Confidential Information is granted other than to use the Confidential Information in the manner and to the extent authorized by this Appendix. The discloser warrants that it is authorized to disclose any Confidential Information it discloses pursuant to this Appendix.

Section 9 PRESERVATION OF MOTOROLA’S PROPRIETARY RIGHTS

Motorola, the third party manufacturer of any Equipment, and the copyright owner of any Non-Motorola Software own and retain all of their respective Proprietary Rights in the Equipment and Software, and nothing in this Appendix is intended to restrict their Proprietary Rights. All intellectual property developed, originated, or prepared by Motorola in connection with providing to Customer the Equipment, Software, or related services remain vested exclusively in Motorola, and this Appendix does not grant to

Customer any shared development rights of intellectual property. Except as explicitly provided in the Software License Agreement, Motorola does not grant to Customer, either directly or by implication, estoppel, or otherwise, any right, title or interest in Motorola's Proprietary Rights. Customer will not modify, disassemble, peel components, decompile, otherwise reverse engineer or attempt to reverse engineer, derive source code or create derivative works from, adapt, translate, merge with other software, reproduce, distribute, sublicense, sell or export the Software, or permit or encourage any third party to do so. The preceding sentence does not apply to Open Source Software which is governed by the standard license of the copyright owner.

Section 10 GENERAL

10.1 **TAXES.** Motorola shall pay all taxes, levies, duties and assessments which may be applicable to any work under this Contract for which it is legally responsible. The Contract Price, and any agreed variations thereof, shall include all taxes imposed by law. Motorola shall make any and all payroll deductions required by law. Motorola herein indemnifies and holds the County harmless from any liability on account of any and all such taxes, levies, duties, assessments and deductions for which Motorola is liable. The inclusion of applicable sales or similar taxes in the Contract Price is conditioned upon the County maintaining, in good standing and for the duration of this Appendix, a Consumer's Certificate of Exemption issued by the Florida Department of Revenue that exempts the County from the payment of Florida sales and use tax on real property rented, transient rental property rented, tangible personal property purchased or rented, or services purchased.

10.2 **SEVERABILITY.** If a court of competent jurisdiction renders any part of this Appendix invalid or unenforceable, that part will be severed and the remainder of this Appendix will continue in full force and effect.

10.3. **INDEPENDENT CONTRACTORS.** Each Party will perform its duties under this Appendix as an independent contractor. The Parties and their personnel will not be considered to be employees or agents of the other Party. Nothing in this Appendix will be interpreted as granting either Party the right or authority to make commitments of any kind for the other. This Appendix will not constitute, create, or be interpreted as a joint venture, partnership or formal business organization of any kind.

10.4. **HEADINGS AND SECTION REFERENCES.** The section headings in this Appendix are inserted only for convenience and are not to be construed as part of this Appendix or as a limitation of the scope of the particular section to which the heading refers. This Appendix will be fairly interpreted in accordance with its terms and conditions and not for or against either Party.

10.5. **ENTIRE APPENDIX.** This Appendix, including all Schedules, constitutes the entire agreement of the Parties regarding the subject matter of the Appendix and supersedes all previous agreements, proposals, and understandings, whether written or oral, relating to this subject matter. This Appendix may be amended or modified only by a written instrument signed by authorized representatives of both Parties. The preprinted terms and conditions found on any Customer purchase order, acknowledgment or other form will not be considered an amendment or modification of this Appendix, even if a representative of each Party signs that document.

10.6. **COMPLIANCE WITH APPLICABLE LAWS.** Each Party will comply with all applicable federal, state, and local laws, regulations and rules concerning the performance of this Appendix or use of the System. Customer will obtain and comply with all Federal Communications Commission ("FCC") licenses and authorizations or those of any other federal, state, or local government agency, required for the installation, maintenance, or operation and use of the System before the scheduled installation of the Equipment. Although Motorola might assist Customer in the preparation of its FCC license applications,

neither Motorola nor any of its employees is an agent or representative of Customer in FCC or other matters.

10.7 FORCE MAJEURE. Neither Party will be liable for its non-performance or delayed performance if caused by a Force Majeure. A Party that becomes aware of a Force Majeure that will significantly delay performance will notify the other Party promptly (but in no event later than fifteen days) after it discovers the Force Majeure. If a Force Majeure occurs, the Parties will execute a change order to extend the Performance Schedule for a time period that is reasonable under the circumstances.

10.8 SURVIVAL OF TERMS. The following provisions will survive the expiration or termination of this Appendix for any reason: Section 4.3 (Motorola Software); Section 4.4 (Non-Motorola Software); if any payment obligations exist, Section 5 (Contract Price and Payment); Subsection 8.2 (Disclaimer of Implied Warranties); and Section 8 (Confidentiality); Section 9 (Preservation of Motorola Proprietary Right; and all of the General provisions in Section 10.

SCHEDULE A - LIFECYCLE STATEMENT OF WORK

1.0 Description of Service and Obligations

- 1.1 As system releases become available, Motorola agrees to provide the Customer with the software, hardware and implementation services required to execute up to one system infrastructure upgrade in a three-year period for their ASTRO 25 system. At the time of the system release upgrade, Motorola will provide applicable patches and service pack updates when and if available. Currently, Motorola's service includes 3rd party SW such as Microsoft Windows and Server OS, Red Hat Linux, Sun Solaris and any Motorola software service packs that may be available. Motorola will only provide patch releases that have been analyzed, pre-tested, and certified in a dedicated ASTRO 25 test lab to ensure that they are compatible and do not interfere with the ASTRO 25 network functionality. The Security Update Service (SUS) coverage is defined in Section 5.
 - 1.1.1 The Palm Beach County, FL ASTRO 25 Lifecycle Agreement is based on the RFP requirements that a full system software upgrade will occur once in a three year period. In addition, technology refresh will occur on a 6 year cycle with the exception that should existing hardware not support a software upgrade, the Contractor shall replace or upgrade the existing hardware, as required, with hardware compatible with the software upgrade.
- 1.2 ASTRO 25 system releases are intended to improve the system functionality and operation from previous releases and may include some minor feature enhancements. At Motorola's option, system releases may also include significant new feature enhancements that Motorola may offer for purchase. System release software and hardware shall be pre-tested and certified in Motorola's Systems Integration Test lab.
- 1.3 ASTRO 25 PALM BEACH LIFECYCLE AGREEMENT entitles a Customer to past software versions for the purpose of downgrading product software to a compatible release version.
- 1.4 The following ASTRO 25 certified system release software for the following products are covered under this ASTRO 25 PALM BEACH LIFECYCLE AGREEMENT: base stations, site controllers, comparators, routers, LAN switches, servers, dispatch consoles, logging equipment, network management terminals, Network Fault Management ("NFM") products, network security devices such as firewalls and intrusion detection sensors, and associated peripheral infrastructure software.
- 1.5 Product programming software such as Radio Service Software ("RSS"), Configuration Service Software ("CSS"), and Customer Programming Software ("CPS") are also covered under this PALM BEACH LIFECYCLE AGREEMENT.
- 1.6 ASTRO 25 PALM BEACH LIFECYCLE AGREEMENT makes available the subscriber radio software releases that are shipping from the factory during the PALM BEACH LIFECYCLE AGREEMENT coverage period. New subscriber radio options and features not previously purchased by the Customer are excluded from ASTRO 25 PALM BEACH LIFECYCLE AGREEMENT coverage. Additionally, subscriber software installation and

reprogramming are excluded from the ASTRO 25 PALM BEACH LIFECYCLE AGREEMENT coverage.

- 1.7 Motorola will provide certified hardware version updates and/or replacements necessary to upgrade the system with an equivalent or better level of functionality up to once in a three-year period. Hardware will be upgraded and/or replaced if required to maintain the existing feature and functionality. Any updates to hardware versions and/or replacement hardware required to support new features or those not specifically required to maintain existing functionality are not included. Unless otherwise stated, platform migrations such as, but not limited to, stations, consoles, backhaul, civil, network changes and additions, and managed services are not included.
- 1.8 The following hardware components, if originally provided by Motorola, are eligible for full product replacement when necessary per the system release upgrade :
 - 1.8.1 Servers
 - 1.8.2 PC Workstations (includes dispatch console workstations)
 - 1.8.3 Routers
 - 1.8.4 LAN Switches
- 1.9 The following hardware components, if originally provided by Motorola, are eligible for board-level replacement when necessary per the system release upgrade. A “board-level replacement” is defined as any Field Replaceable Unit (“FRU”) for the products listed below:
 - 1.9.1 GTR 8000 Base Stations
 - 1.9.2 GCP 8000 Site Controllers
 - 1.9.3 GCM 8000 Comparators
 - 1.9.4 MCC 7500 Console Operator Positions
 - 1.9.5 STR 3000 Base Stations
 - 1.9.6 Quantar Base Stations
 - 1.9.7 Centracom Gold Elite Console Operator Interface Electronics
 - 1.9.8 Centracom Gold Elite Central Electronics Banks
 - 1.9.9 Ambassador Electronics Banks
 - 1.9.10 Motorola Gold Elite Gateways
 - 1.9.11 ASTROTAC Comparators
 - 1.9.12 PSC 9600 Site Controllers
 - 1.9.13 PBX Switches for Telephone Interconnect
 - 1.9.14 NFM/NFM XC/MOSCAD RTU
- 1.10 The ASTRO 25 PALM BEACH LIFECYCLE AGREEMENT does not cover all products. Refer to section 3.0 for exclusions and limitations.
- 1.11 Motorola will provide implementation services necessary to upgrade the system to a future system release with an equivalent level of functionality up to once in a three-year period. Any implementation services that are not directly required to support the system upgrade are not included. Unless otherwise stated, implementation services necessary for system expansions, platform migrations, and/or new features or functionality that are implemented concurrent with the system upgrade are not included.
- 1.12 As system releases become available, Motorola will provide up to once in a three-year period the following software design and technical resources necessary to complete system release upgrades:

- 1.12.1 Review infrastructure system audit data as needed.
 - 1.12.2 Identify additional system equipment needed to implement a system release, if applicable.
 - 1.12.3 Complete a proposal defining the system release, equipment requirements, installation plan, and impact to system users.
 - 1.12.4 Advise Customer of probable impact to system users during the actual field upgrade implementation.
 - 1.12.5 Program management support required to perform the system upgrade.
 - 1.12.6 Field installation labor required to perform the system upgrade.
 - 1.12.7 Upgrade operations engineering labor required to perform the system upgrade.
- 1.13 ASTRO 25 PALM BEACH LIFECYCLE AGREEMENT pricing is based on the system configuration outlined below. This configuration is to be reviewed annually from the contract effective date. Any change in system configuration may require an ASTRO 25 PALM BEACH LIFECYCLE AGREEMENT price adjustment.
- 1.13.1 This configuration is to be reviewed annually from the contract effective date. Any change in system configuration may require an ASTRO 25 PALM BEACH LIFECYCLE AGREEMENT price adjustment.

Core	
Master Site Configuration	M3
Zones in Operation (Including DSR and Dark Master Sites)	2
Zone Features: IV&D, TDMA, Telephone Interconnect, CNI, HPD, CSMS, IA, POP25, Text Messaging, Outdoor Location, ISSI 8000, InfoVista, KMF/OTAR	9
RF System	
Voice RF Sites & RF Simulcast Sites (including Prime Sites)	13
Repeaters/Stations (FDMA)	147
Repeaters/Stations (TDMA)	108
HPD RF Sites	0
HPD Stations	0
Dispatch Console System	
Dispatch Sites	10
Gold Elite Operator Positions	0
MCC 7500 Operator Positions (GPIOM)	0
MCC 7500 Operator Positions (VPM)	49
Conventional Channel Gateways (CCGW)	13
Conventional Site Controllers (GCP 8000 Controller)	5
Logging System	
Number of AIS Servers	4
Number of Voice Logging Recorder	0
Number of Logging Replay Clients	0
Network Management and MOSCAD NFM	
Network Management Clients	6
MOSCAD NFM Systems	1
MOSCAD NFM RTUs	15
MOSCAD NFM Clients	6
Fire Station Alerting (FSA)	
FSA Systems	0
FSA RTUs	0
FSA Clients	0
Fire Station Alerting (FSA)	
Voice Subscribers non-APX	0
Voice Subscribers APX	0
HPD Subscribers	0
Computing and Networking Hardware (for PALM BEACH LIFECYCLE AGREEMENT, actual replacement qty may be less than shown)	
Workstations - High Performance	6
Workstations - Mid Performance	57
Servers - High Performance	7
Servers - Mid Performance	3
LAN Switch - High Performance	6
LAN Switch - Mid Performance	39
Routers	53

- 1.14 The ASTRO 25 PALM BEACH LIFECYCLE AGREEMENT applies only to system release upgrades within the ASTRO 25 7.x platform.

- 1.15 Motorola will issue Software Maintenance Agreement (“SMA”) bulletins on an annual basis and post them in soft copy on a designated extranet site for Customer access. Standard and optional features for a given ASTRO 25 system release are listed in the SMA bulletin.

2.0 Upgrade Elements and Corresponding Party Responsibilities

- 2.1 Upgrade Planning and Preparation: All items listed in this section are to be completed at least 6 months prior to a scheduled upgrade.

- 2.1.1 Motorola responsibilities
 - 2.1.1.1 Obtain and review infrastructure system audit data as needed.
 - 2.1.1.2 Identify additional system equipment needed to implement a system release, if applicable.
 - 2.1.1.3 Complete a proposal defining the system release, equipment requirements, installation plan, and impact to system users.
 - 2.1.1.4 Advise Customer of probable impact to system users during the actual field upgrade implementation.
 - 2.1.1.5 Inform Customer of high speed internet connection requirements.
 - 2.1.1.6 Assign program management support required to perform the system upgrade.
 - 2.1.1.7 Assign field installation labor required to perform the system upgrade.
 - 2.1.1.8 Assign upgrade operations engineering labor required to perform the system upgrade.
 - 2.1.1.9 Deliver release impact and change management training to the primary zone core owners, outlining the changes to their system as a result of the upgrade path elected. This training needs to be completed at least 12 weeks prior to the scheduled upgrade. This training will not be provided separately for user agencies who reside on a zone core owned by another entity. Unless specifically stated in this document, Motorola will provide this training only once per system per upgrade.
- 2.1.2 Customer responsibilities
 - 2.1.2.1 Contact Motorola to schedule and engage the appropriate Motorola resources for a system release upgrade.
 - 2.1.2.2 Provide high-speed internet connectivity at the zone core site(s) for use by Motorola to perform remote upgrades and diagnostics. Specifications for the high-speed connection are provided below. High-speed internet connectivity must be provided at least 12 weeks prior to the scheduled upgrade. In the event access to a high-speed connection is unavailable, Customer may be billed additional costs to execute the system release upgrade.
 - 2.1.2.2.1 **Connectivity Requirements**
 - The minimum supported link between the core and the zone is a full T1
 - Any link must realize or sustained transfer rate of 175 kbps / 1.4 Mbps or better, bidirectional
 - Interzone links must be fully operational when present
 - Link reliability must satisfy these minimum QoS levels:
 - Port availability must meet or exceed 99.9% (three nines)

- Round trip network delay must be 100 ms or less between the core and satellite (North America) and 400 ms or less for international links
 - Packet loss shall be no greater than 0.3%
 - Network jitter shall be no greater than 2 ms
 - The network requirements above are based on the SLA provided for Sprint Dedicated IP Services as of April, 2012. It is possible other vendors may not be able to meet this exact SLA, so these cases must be examined on a case-by-case basis.
 - 2.1.2.3 Assist in site walks of the system during the system audit when necessary.
 - 2.1.2.4 Provide a list of any FRUs and/or spare hardware to be included in the system release upgrade when applicable.
 - 2.1.2.5 Purchase any additional software and hardware necessary to implement optional system release features or system expansions.
 - 2.1.2.6 Provide or purchase labor to implement optional system release features or system expansions.
 - 2.1.2.7 Participate in release impact training at least 12 weeks prior to the scheduled upgrade. This applies only to primary zone core owners. It is the zone core owner's responsibility to contact and include any user agencies that need to be trained or to act as a training agency for those users not included.
- 2.2 System Readiness Checkpoint: All items listed in this section must be completed at least 30 days prior to a scheduled upgrade.
- 2.2.1 Motorola responsibilities
 - 2.2.1.1 Perform appropriate system backups.
 - 2.2.1.2 Work with the Customer to validate that all system maintenance is current.
 - 2.2.1.3 Work with the Customer to validate that all available patches and antivirus updates have been updated on the customer's system.
 - 2.2.2 Customer responsibilities
 - 2.2.2.1 Validate system maintenance is current.
 - 2.2.2.2 Validate that all available patches and antivirus updates to their system have been completed.
- 2.3 System Upgrade
- 2.3.1 Motorola responsibilities
 - 2.3.1.1 Perform system infrastructure upgrade in accordance with the system elements outlined in this SOW.
 - 2.3.2 Customer responsibilities
 - 2.3.2.1 Inform system users of software upgrade plans and scheduled system downtime.
 - 2.3.2.2 Cooperate with Motorola and perform all acts that are reasonable or necessary to enable Motorola to provide software upgrade services.
- 2.4 Upgrade Completion
- 2.4.1 Motorola responsibilities

- 2.4.1.1 Validate all system upgrade deliverables are complete as contractually required.
- 2.4.1.2 Deliver post upgrade implementation training to the customer as needed, up to once per system per upgrade.
- 2.4.1.3 Obtain upgrade completion sign off from the customer.
- 2.4.2 Customer Responsibilities
 - 2.4.2.1 Cooperate with Motorola in efforts to complete any post upgrade punch list items as needed.
 - 2.4.2.2 Cooperate with Motorola to provide relevant post upgrade implementation training as needed. This applies only to primary zone core owners. It is the zone core owner's responsibility to contact and include any user agencies that need to be trained or to act as a training agency for those users not included.
 - 2.4.2.3 Provide Motorola with upgrade completion sign off.

3.0 Exclusions and Limitations

- 3.1 The parties agree that Systems that have non-standard configurations that have not been certified by Motorola Systems Integration Testing are specifically excluded from the ASTRO 25 PALM BEACH LIFECYCLE AGREEMENT unless otherwise agreed in writing by Motorola and included in this SOW.
- 3.2 The parties acknowledge and agree that the ASTRO 25 PALM BEACH LIFECYCLE AGREEMENT does not cover the following products:
 - MCC5500 Dispatch Consoles
 - MIP5000 Dispatch Consoles
 - Plant/E911 Systems
 - MOTOBRIDGE Solutions
 - ARC 4000 Systems
 - Motorola Public Sector Applications Software ("PSA")
 - Custom SW, CAD, Records Management Software
 - Data Radio Devices
 - Mobile computing devices such as Laptops
 - Non-Motorola two-way radio subscriber products
 - Genesis Products
 - Point-to-point products such as microwave terminals and association multiplex equipment
- 3.3 ASTRO 25 PALM BEACH LIFECYCLE AGREEMENT does not cover any hardware or software supplied to the Customer when purchased directly from a third party, unless specifically included in this SOW.
- 3.4 ASTRO 25 PALM BEACH LIFECYCLE AGREEMENT does not cover software support for virus attacks or other applications that are not part of the ASTRO 25 system, or unauthorized modifications or other misuse of the covered software. Motorola is not responsible for management of non-Motorola certified anti-virus or other security applications.

- 3.5 Upgrades for equipment add-ons or expansions during the term of this ASTRO 25 PALM BEACH LIFECYCLE AGREEMENT are not included in the coverage of this SOW unless otherwise agreed to in writing by Motorola.

4.0 Special provisions

- 4.1 Customer acknowledges that if its System has a Special Product Feature, additional engineering may be required to prevent an installed system release from overwriting the Special Product Feature. Upon request, Motorola will determine whether a Special Product Feature can be incorporated into a system release and whether additional engineering effort is required. If additional engineering is required Motorola will issue a change order for the change in scope and associated increase in the price for the ASTRO 25 PALM BEACH LIFECYCLE AGREEMENT.
- 4.2 Customer will only use the software (including any System Releases) in accordance with the applicable Software License Agreement.
- 4.3 ASTRO 25 PALM BEACH LIFECYCLE AGREEMENT services do not include repair or replacement of hardware or software that is necessary due to defects that are not corrected by the system release, nor does it include repair or replacement of defects resulting from any nonstandard, improper use or conditions; or from unauthorized installation of software.
- 4.4 ASTRO 25 PALM BEACH LIFECYCLE AGREEMENT coverage and the parties' responsibilities described in this Statement of Work will automatically terminate if Motorola no longer supports the ASTRO 25 7.x software version in the Customer's system or discontinues the ASTRO 25 PALM BEACH LIFECYCLE AGREEMENT program; in either case, Motorola will refund to Customer any prepaid fees for ASTRO 25 PALM BEACH LIFECYCLE AGREEMENT services applicable to the terminated period.
- 4.5 If Customer cancels a scheduled upgrade within less than 12 weeks of the scheduled on site date, Motorola reserves the right to charge the Customer a cancellation fee equivalent to the cost of the pre-planning efforts completed by the Motorola Solutions Upgrade Operations Team.
- 4.6 If Customer terminates, except if Motorola is the defaulting party, Customer will be required to pay for the balance of payments owed if a system release upgrade has been taken prior to the point of termination.

NEGOTIATED PAYMENT SCHEDULE FOR SOFTWARE UPGRADE AND TECHNOLOGY REFRESH

Customer will make payments to Motorola within thirty (30) days after the date of each invoice. Customer will make payments when due in the form of a check, cashier's check, or wire transfer drawn on a U.S. financial institution and in accordance with the following milestones.

This payment schedule applies to the software upgrade and technology refresh in years 3, 6, 9, 12 and 15. Software upgrade and technology refresh pricing is Section 1.15 of Appendix D of the Primary Contract.

Milestone	Description	Percent Payment of Total Annual Cost
1	Delivery of upgrade design & schedule	10%
2	Upgrade completion	90%

BUDGET AVAILABILITY STATEMENT

PHONE: 233-0204

PROJECT NO.: 14212

BCC RESOLUTION#/DATE:

CSA/LOA CHANGE ORDER NUMBER:

CONTRACTOR/CONSULTANT NAME: Motorola Solutions, Inc.

PROVIDE A BRIEF STATEMENT OF THE SCOPE OF SERVICES TO BE PROVIDED BY THE CONSULTANT/CONTRACTOR: The contract includes all services to replace the existing public safety radio system with one which meets P25 standards. The contract also includes 15 years of Life Cycle Support Services which will be paid out over the 15 years following Final System Acceptance. The contract also includes the terms of a 16 year maintenance agreement which will be encumbered separately via annual purchase orders.

**WILL THIS AMENDMENT CHANGE THE ESTIMATED COST OF THE PROJECT?
IF YES, PROVIDE ESTIMATES OF THE NEW COSTS:**

CONSTRUCTION	
ARCHITECTURE/ENGINEER	
*STAFF COSTS	
EQUIPMENT/OTHER	\$19,608,659.47
TOTAL	\$19,608,659.47

***By signing this BAS your department agrees to these staff costs and your account will be charged upon receipt of this BAS by FD&O. Unless there is a change in the scope of work, no additional staff charges will be billed.**

BUDGET ACCOUNT NUMBER:

FUND: 3801 AGENCY: 411 ORG: B595 OBJ: 4907 SUBOBJ:

The amount of the BAS does not include \$564,436.53 which is being funded by Fire Rescue separately.

AGREEMENT TO BE APPROVED BY: BCC

ANTICIPATED DATE OF APPROVAL: 11/17/15

BAS APPROVED BY: _____ DATE: 11-8-11

ENCUMBRANCE NUMBER: 110215-113



BUDGET AVAILABILITY STATEMENT
PALM BEACH COUNTY
FD&O DEPARTMENT

TO

NAME: Randy Ali	TITLE: Fire Rescue Communications Coordinator
DEPT/DIV: Fire Rescue / Support Services	

FROM

NAME: MARK FILLA	TITLE: Manager, Radio Systems
DIVISION: Electronic Services and Security	PHONE: (561) 233-0837
PROJECT NAME:	PROJECT NO.:

PROJECT DESCRIPTION:

Item	Qty	Model	Description	Unit List Price	PBC Contract Price	Extended PBC Price
1	499	T766A	APX Analog SmartZone	\$0	\$0	\$0
1a	499	Q808AL	ASTRO Digital CAI	\$592.00	\$444.00	\$221,556.00
1b	499	Q361AT	P25 9600 Baud Trunking	\$345.00	\$258.75	\$129,116.25

The cost associated with the above described project or equipment is delineated below and on the attached requisition.

VENDOR-CONTRACTOR-PERMIT		STAFF	MATERIALS	SERVICE
1.	MOTOROLA		\$350,672.25	
2.				
3.				
4.				
5.				
6.				

Material/ Service	\$350,672.25
Installation/Staff	
Contingency	
TOTAL BAS AMOUNT	\$350,672.25

Signing below indicates that you wish to proceed with the above described project and are authorizing the use of the account number(s) below as the source for the sums indicated. Please fill in the appropriate budget account number(s) and return this form to the requestor.

BUDGET ACCOUNT NUMBERS (IDENTIFY ALL SOURCES) FUNDING SOURCE

FUND	DEPT	UNIT	OBJ	SUBOBJ	AMOUNT
1300	440	4219	6411		\$350,672.25

<input type="checkbox"/> AD VALOREM	<input type="checkbox"/> OTHER / GRANT(S)	<input type="checkbox"/> FEDERAL / DAVIS BACON
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If Grant(s), specify name of Grant(s):

SUBJECT TO INSPECTOR GENERAL FEE: ☐ YES ☐ NO

AUTHORIZED SIGNATURE: *Michael C. Macker* DATE: 11-2-15

ENCUMBERANCE NUMBER: 110215-113



BUDGET AVAILABILITY STATEMENT
PALM BEACH COUNTY
FD&O DEPARTMENT

TO

NAME: Randy Ali	TITLE: Fire Rescue Communications Coordinator
DEPT/DIV: Fire Rescue / Support Services	

FROM

NAME: Ken Denker	TITLE: Supervisor, Electronics Systems
DIVISION: Electronic Services and Security	PHONE: (561) 233-0831
PROJECT NAME:	PROJECT NO.:

PROJECT DESCRIPTION:

4ea MOTOROLA MCC 7500 IP DISPATCH CONSOLES

The cost associated with the above described project or equipment is delineated below and on the attached requisition.

VENDOR-CONTRACTOR-PERMIT		STAFF	MATERIALS	SERVICE
1.	MOTOROLA		\$213,764.28	
2.				
3.				
4.				
5.				
6.				

Material/ Service	\$213,764.28
Installation/Staff	
Contingency	
TOTAL BAS AMOUNT	\$213,764.28

Signing below indicates that you wish to proceed with the above described project and are authorizing the use of the account number(s) below as the source for the sums indicated. Please fill in the appropriate budget account number(s) and return this form to the requestor.

BUDGET ACCOUNT NUMBERS (IDENTIFY ALL SOURCES) FUNDING SOURCE

FUND	DEPT	UNIT	OBJ	SUBOBJ	AMOUNT
1300	440	4219	6411		\$213,764.28

☐ AD VALOREM

☐ OTHER / GRANT(S)

☐ FEDERAL / DAVIS BACON

If Grant(s), specify name of Grant(s):

SUBJECT TO INSPECTOR GENERAL FEE: ☐ YES ☐ NO

AUTHORIZED SIGNATURE: *Michael C. Macker* DATE: 10-26-15

ENCUMBRANCE NUMBER: 60815-113