Agenda Item No: 13.C

STAFF REPORT

Report To: Board of Supervisors **Meeting Date:** May 16, 2019

Staff Contact: Carol Akers and James Jacklett

Agenda Title: For Possible Action: Discussion and possible action regarding approval to purchase six dispatch consoles, six back-up base radios, interop gateway equipment, switching equipment and associated services and support through joinder contract #P697-16-016, between Harris Corporation and the Nevada Department of Transportation (NDOT) for a not to exceed amount of $615,946.45 to be funded from the Fleet Radio Equipment Account. (Carol Akers, Cakers@carson.org and James Jacklett, Jjacklett@carson.org)

Staff Summary: The existing radio dispatch console system is beyond end-of-life and is no longer supported by the manufacturer. The new dispatch consoles will connect to the Statewide Public Safety Radio System's geographically redundant core network. Utilizing the Statewide System core will provide savings in excess of one million dollars over the initial 10-year period when compared to purchasing and maintaining our own radio core. The purchase also includes six back-up radios that will be installed and configured to provide fallback communications capability to ensure that a disruption in connectivity to the Statewide System core will not prevent dispatchers from talking to City resources.

Agenda Action: Formal Action / Motion **Time Requested:** 5 minutes

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Proposed Motion

I move to approve the purchase of the items proposed through the joinder agreement between Harris Corporation and NDOT for a not to exceed amount of $615,946.45.

Board's Strategic Goal

Safety

Previous Action

FY18 BOS Approved CIP included $600,000 for the Replacement Radio Console.

November 15, 2018-The Board approved the purchase of radio equipment through joinder contract between Harris Corporation, Washoe County and NDOT, for radio equipment including replacement radios, parts and accessories.

Background/Issues & Analysis

Prior to its consideration of this item, the Board of Supervisors will discuss and may take action on an interlocal agreement with NDOT providing for the use of the Statewide Public Safety Radio System. The proposed console solution is dependent upon that agreement. The new dispatch consoles will connect to the Statewide Public Safety Radio System's geographically redundant core network. Utilizing the Statewide System core will allow the City to leverage the investment and resources of the Statewide System and deliver state of the art

radio capability to our public safety users. If the City determines that participation in the Statewide System is no longer desired it will need to purchase and maintain a core network to operate the radio consoles.

Contract being utilized: (Joinder)
Nevada Shared Radio System (NSRS)
Service Agreement Number P697-16-016 through Nevada Department of Transportation (expires December 2028)

Applicable Statute, Code, Policy, Rule or Regulation
NRS 332.195

Financial Information
Is there a fiscal impact? Yes

If yes, account name/number: Fleet Radio Equipment Account / 560-3055-419.77-75, Project 091901

Is it currently budgeted? Yes

Explanation of Fiscal Impact: This solution includes $428,014.45 in equipment; $105,373.00 for engineering, project management, installation and programming; $43,125.00 in training; and $39,434.00 for warranty, maintenance, and support. The ongoing cost for support and services is anticipated at $30,434.00 per year starting year 3. Each console will also require an annual radio unit fee to NDOT for operation on the statewide system estimated at $705 each or $4,230 for six consoles annually. The available budget in 560-3055-419.77-45 is $600,000.00 and a transfer of $15,946.45 from 560-3055-419.03-09 will be made into 560-3055-419.77-75, Project 091901.
In FY20 the $4,230 annual cost will be paid from the Microwave/Ethernet Maintenance Account-560-305-419.04-39, starting FY21 a new line should be added to the budget for Subscriber Services that will be used to pay for the subscriber fees for the consoles and the portable and mobile radios.

Alternatives
Do not approve purchase and provide direction to staff.

Attachments:
20190501 Carson City Consoles Final Proposal.pdf

Board Action Taken:

Motion: _____	1) _____	Aye/Nay
	2) _____	_____
		_____
		_____
		_____
		_____

_____
(Vote Recorded By)

SYMPHONY DISPATCH CONSOLES

Carson City, Nevada

April 2019

PROPRIETARY INFORMATION

HARRIS®

TECHNOLOGY TO CONNECT, INFORM AND PROTECT™

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Table of Contents

Table of Contents

Console Description

Introduction

A completely solid-state design affords the high reliability needed for dependable communications in emergency situations.

Harris is pleased to provide a quote to Carson City for six Symphony dispatch consoles, back-up control stations, and interoperability gateway (IGW) add-ons as requested for use by the Public Works department. The Symphony consoles will be in Carson City, NV at a single dispatch facility. This quote provides the City with firm fixed pricing information to assist in procuring the dispatch consoles and interoperability gateways.

This quote includes six consoles and associated licenses for existing Networking Switching Center upgrades, six back-up control stations, and one new interoperability gateway chassis and 8 total port additions. The Symphony consoles in Carson City will interface to the P25 VIDA switches in northern Nevada (Washoe County). This quote is firm fixed and includes services quoted separately. Harris looks forward to working collaboratively with Carson City and their Public Works representatives on this equipment purchase and installation.

The requested console is a Symphony Premier Win8 Bundle. The current VIDA platform serving Carson City is version SR10.1 and has not been tested to operate with Win10. The Symphony Premier Win8 Bundle includes the following pre-installed licenses on a per console basis:

- Local Baton
- Remote Baton
- Patch Activations (8)
- SimulSelect Definitions (16)
- Speaker Licenses (4)
- User Setups (4)
- Workspace Tabs (16)
- I-Calls
- Call Director
- Local Full Screen
- Flexpaths (12)

Proposed Dispatch Console Equipment

The Symphony Dispatch Platform (SDP) is Harris' mission critical dispatch solution designed by dispatchers for dispatchers. Attached to the existing north Network Switching Center will be six dispatch consoles at a single dispatch facility. Because Carson City will purchase off the NDOT NSRS

Contract, NDOT's base console & router configurations are listed below in Figure 1. The table in Figure 1 also lists the hardware and software features that will be added to the proposed consoles.

Figure 1. NDOT's NSRS Contract & Carson City Console & Router Configurations

	NDOT Contract Console Configuration	Additional Software Features for Carson City Public Works	Carson City Public Works Console Configuration
Paging Capability License		X	X
Remote Aux I/O License		X	X
Remote Baton Software	X		X
Console Bundle Win10	X		Console Bundle Win8
AES/DES Encryption License	X		X
Conventional Controls License	X		X
Marker Tone License	X		X
Base SIP License	X		X
SIP 4 Extensions	X		X
Speakers (2 per position)	X		4 per position
23" High Def Monitor	X		24" Touchscreen HD
Mouse	X		X
Keyboard	X		X
Single Foot Switch	X		Dual Foot Switch
Desk Microphone	X		X
Jackbox, 6-wire (2)	X		X
Jackbox to Headset Adapter (2)	X		X
Headset (over-the-head, solid boom) (2)	X		X
Vocoder License	X		X
UPS Power Supply	X		X
Router, ISR4221 – SEC/K9, 4 port NIM mode, Layer 2 GE (Qty. 2)	X		X
Cisco 2960 Plus Switch (Qty. 2)	X		X

The existing router/switch is routed to the North core through a T1 connection. The Network Requirements section outlines the minimum backhaul requirement specifications for the new consoles. The existing T1 connection is not sufficient for site connectivity to the new consoles and must be upgraded.

The existing Carson City GWB site (#13) is connected to the region's Ethernet microwave ring and is the planned new console site. The site 104 router is the router that site 13 will route through to reach the North core. Harris will ensure that the site routers at the dispatch center and the site 104 router are configured properly to route the console and interop traffic to and from the core. There are available ports on the existing 2911 router for the new console connections, but Harris is providing the latest 4K series Cisco routers in a redundant configuration so Carson City is positioned and ready for future enhancements. The redundant network connection optimizes the Symphony console's redundant NIC ports. Additionally, the IGW UAC cards will be spread across the redundant routers, minimizing impact in the case of a potential hardware failure.

Control Stations

CS7000 DESKTOP STATION

The CS7000 desktop control station is configured with a multi-band XG-100M (Unity mobile) utilizing the CH-721 control head as pictured in Figure 2 below. A desktop microphone attaches to the front panel. A USB port and RS-232 serial connectors on the back panel allow external connections (e.g., auxiliary audio inputs, external PTT, etc.) to the desktop station. New coaxial cable will be run from the control stations in the radio equipment room to the multi-band antennas (VHF/UHF/800 MHz) on the roof. A rack mount shelf similar to the one pictured below will be provided to rack mount remote CS7000 units.

Figure 2. Desktop Control Station with Local or Remote Control and Full Keypad

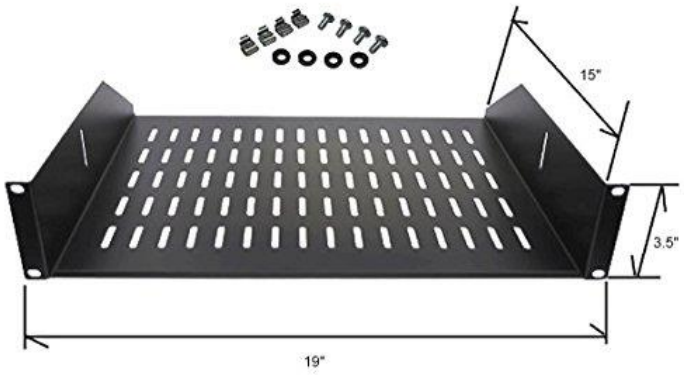

Figure 3. NDOT's NSRS Control Station Configuration

	NDOT Contract Console Configuration	Carson City Public Works Console Configuration
P25 Phase 2	X	X
Link Layer Authentication (LLA)	X	X
AES Encryption	X	X
OTAP	X	X
OTAR	X	X
Desktop Microphone	X	X
Antenna System	X	X

REMOTE CONTROL FLEXIBILITY

A local/remote control CS7000 control station is equipped with industry standard RJ-11 LINE input connector, standard CAN interface, and RJ-45 Ethernet Local Area Network (LAN) jacks to support multiple connectivity options, including:

- Tone Control – The CS7000 is configurable to support tone (two-wire or four-wire line) remote equipment connected via the remote interface module.
- Voice over Internet Protocol (VoIP) connection – Utilizing an existing Wide Area Network (WAN) or LAN, an IP remote controller can interface to the CS7000.

MULTI-MODE OPERATION

As a multi-mode radio, the CS7000 can support a variety of protocols:

- FM analog conventional
- P25 Trunking, Phase 1

- P25 Trunking, Phase 2
- P25 Conventional CAI

The control stations will be installed in the radio equipment room with a SP721 remote control unit installed at the console position. The SP721 is shown in Figure 4 below.

Figure 4. SP721 Desktop Remote Controller

In addition, connectivity will be provided between the Symphony Dispatch Platform (SDP) and the back-up control station via the SDP's Backup Radio interface. The Backup Radio feature enables the dispatcher to connect the console to a mobile radio in the event the network connection goes down. The PTT and audio signals from the desk microphone, headset, speakers, and footswitch are summed and sent to the radio in backup mode. The three-position Backup Radio switch (Auto, Disable, or Manual) located on the front of the Symphony Dispatch platform enables or disables the backup radio mode. Ted Collins will work with Carson City Public Works during the integration phase and provide a working solution for a switch at the console operator's position.

The Backup Radio Switch selects the Backup Radio mode from the following choices:

- Auto
- Disable
- Manual

With a Backup Radio installed:

- In the DISABLE mode, the Backup Radio connection is always disabled.
- In the MANUAL mode, the Backup Radio connection is in a "Bypass Only" state and stays enabled and activated until the mode is changed.
- In the AUTO mode, the Backup Radio connection is engaged when the console is shut down and automatically disengages when the console starts.

Interoperability Gateway

The Interoperability Gateway interfaces to legacy conventional resources at the dispatch location via a wire line interface. Any source that provides analog audio can connect to an Interoperability Gateway. Each single source of analog audio connected to the Interoperability Gateway maps to a talkgroup within the radio system.

Each interoperability talkpath maps to a single source of audio (e.g., one base station, a channel on a conventional system, one talkgroup on a trunked system). Interoperability Gateway UAC modules offer a 4-wire balanced line level interface for the audio connection.

Harris will provide 8 interoperability talkpaths to interface to existing VHF equipment. They break down as follows:

- The existing IGW, that currently has 4 UAC ports (i.e. 1 UAC card)
  - 4 total UAC ports will be available in the existing IGW chassis
- A new IGW chassis will be installed with 8 UAC ports (i.e. 2 UAC cards)
  - 8 new UAC ports will be available in a new IGW chassis

This brings the total number of UAC ports to 12 interfaces with the potential for 20 ports if the NDOT cards on hand are installed. Additional cables for the NDOT cards are included. The network LAN connection for the three UAC cards will be spread across the redundant network routers/switches.

Figure 5. Harris Interoperability Gateway Chassis

VIDA Network WAN Requirements

To guarantee the quality of voice through the VIDA network, all WAN links will need to strictly adhere to the requirements provided in the following sections. Conformance with these design requirements is a necessary condition for Harris to meet the overall performance needs of the VIDA system. All of these requirements are necessary to provide a guaranteed level of service for voice quality. Failure to adhere to these requirements could result in poor audio for which Harris cannot be held accountable. In the event of audio problems, Harris will work with the customer to determine the source of the problem. If the problem is determined to be in the customer supplied backhaul, Harris will be available on a contract basis to help resolve the issue.

PACKET LOSS REQUIREMENTS

Due to the connectionless nature of UDP used in transmitting voice packets, minimal packet loss is tolerable in the VIDA network. However, any packet loss could result in degraded voice quality or loss of voice. Harris will not be held responsible for degraded voice quality that comes from the result of packet loss in the customer provided transport network.

Performance testing to be measured based on the following:

- RFC 2544 standard to be used
- Length of test per link shall be 12hrs
- Frame loss shall be less than .01%

- Out-of-Order packets shall be less than .01%

CONSOLE OR MULTI-SITE JITTER (ONE-WAY)

Jitter is the variability of packet delays within the same voice packet stream (talk spurt). The requirement is for the overall jitter to average to zero and to never build up to more than 60 msec one-way. Any streams with excessive jitter will be considered to have packet loss and Harris will not be responsible for voice quality issues.

For example, if a voice packet were 60 milliseconds late, then it would be optimal for the next few voice packets to be early to get the average jitter back to zero. This will allow the voice buffer to build back to a stable point.

For allowable Simulcast Jitter, refer to the IP Simulcast Latency and Jitter section.

LATENCY REQUIREMENTS (ONE-WAY)

Some degree of latency, such as satellite links, can be supported within the VIDA network. Harris will not be held responsible for voice latency requirements if the provided WAN connection has more latency than the requirement. Any latency within the system will need to stay constant to avoid jitter. Latency requirement differ based on the site type and traffic patterns. This section defines latency requirements for Console or Multisite to NSC, NSC to NSC, Simulcast Site to Control Point, and Control Point to NSC.

Latency is measured one-way. Asymmetric latency is permitted if one-way measurements meet specifications below. Satellite links can be supported after system timers are modified to account for satellite delay.

- NSC Latency
  - NSC to NSC latency must be less than *(150ms)*
- Console and Multisite Latency
  - Console or Multisite to NSC latency must be less than *(150ms - NSC Latency)*

Layer 2 Quality of Service Requirements

If Layer 2 WAN services are being provided, the layer 2 WAN should map our layer 3 DSCP markings into the appropriate layer 2 queues that meet the layer 3 requirements.

Layer 3 Quality of Service Requirements

At OSI Layer 3, the network will recognize, and forward Harris voice traffic marked using the Differentiated Services Code Point (DSCP) byte and the network will also meet the following requirements:

1. The Platinum (DSCP EF) queue should be treated as a strict priority queue for voice.
2. All other queues should be treated as CBWFQ.
3. All DSCP values should not be manipulated during transport.

Figure 6. QOS Level Summarization

Level	DSCP Marking	Bandwidth Reservation	Queuing Method	IP Services
Platinum Plus	CS6	5%	Class Based Weighted Fair Queue	EIGRP Traffic
Platinum	EF	50%	Priority Class Based Weighted Fair Queue	VNIC Voice Traffic, VNIC Management Traffic
Multicast	AF42	15%	Class Based Weighted Fair Queue	Site Multicast Traffic (Heartbeat)
Gold	AF41	10%	Class Based Weighted Fair Queue	HA Synchronization Traffic, P25 Data (OTAP, OTAR, …)
Silver	AF31	10%	Class Based Weighted Fair Queue	RNM ICMP Traffic, Windows Remote Desktop (RDC), Secure Shell (SSH)
Bronze	AF11	5%	Class Based Weighted Fair Queue	SNMP Management Traffic, SysLog, ICMP
Best Effort (Default)	BE (0)	None	None	All Else

Bandwidth Requirements

The link minimum bandwidth requirement for 6 Symphony consoles is 5.4 Mbps of bandwidth. Harris' recommendation is for the customer to install a Layer 2 Ethernet link that is 10 Mbps between the core location and the console site location.

Summary

Harris is a leader in providing secure, mission-critical public safety voice and data networks in the State of Nevada, throughout the United States and worldwide. We look forward to the opportunity to collaborate with Carson City Public Works to provide dispatchers with high-performing and reliable consoles and interoperability equipment.

Statement of Work (SOW)

Console Installation

This SOW is subject to the Agreement Terms and Conditions in the following Terms and Conditions section. The Equipment covered by this SOW is located with the console pricing summary. The following responsibility matrices provides the project activities for which the Harris Team is responsible, and those activities that are Carson City's responsibility.

Tasks	Harris	Carson City
Equipment Installation		
Assemble project team and travel to the Carson City's location	X	
Assemble customer team for kick-off meeting		X
Provide location in appropriate conference room or training facility		X
Present preliminary information on sites and design	X	
Provide information and status on sites		X
Install 2 routers and 2 switches in the dispatch facility	X	
Configure the Remote Network Manager	X	
Install ethernet interface cables for connectivity between the equipment room and dispatch center	X	
Install 5 Symphony Consoles in the main dispatch area	X	
Install 1 Symphony Console in the training room	X	
Configure Symphony Consoles for call director operation	X	
Install 6 backup control radios and SP721 units	X	
Install UAC cards in existing and new Network First Gateway shelves for control of existing conventional stations	X	
Install demarcation blocks for station control and cross connects	X	
Configure UAS for conventional dispatch channels	X	
Perform Functional Acceptance Testing	X	
Provide space in existing equipment for new equipment		X
Approve acceptance test results (within 5 business days)		X
Provide temporary storage locations at installation sites		X
Provide console location for installation that is clear and free of all obstructions, and has mountable hardware areas for Harris equipment, with 120VAC power sockets at plug distance from Equipment		X
Provide a ground point for grounding of equipment		X

Harris Installation

The following installation standards shall be adhered to:

- The National Electrical Code and any other pertinent electrical codes or construction codes shall be rigidly adhered to.
- All grounding shall be performed utilizing the proper wire size per the Contractor Standards. It shall be GREEN colored insulated wire and used at all install location (except for manufacture pre-built power cables which may have black ground wires). Proper size split bolts, c-taps and/or Cad-Weld shall be used, as determined by the application. This applies to all racks and each console position as well.
- All work shall be performed in a neat and professional workmanship-like manner with safety measures adhered to.
- All trash generated by Harris associated with the installation of assigned work scope shall be removed from the work site daily by Harris and disposed of properly and legally.
- No transmission lines will be relocated or spliced on any site.
- If applicable, all outside hardware supplied by the Harris shall be made of galvanized steel or other acceptable non-rusting material and comply with Harris installation standards.
- All cables, Signal (data, where applicable), shall be tagged and permanently labeled by Harris in accordance with Harris installation standards.
- Harris is to identify and record all wiring terminations made to each punch block. A copy of this information is to be provided to the Customer at the end of the installation

Exclusions by Harris

The following are excluded from this Statement of Work and therefore not included in the Harris quotation.

- Site Civils equipment and Installation
- Site Management
- Site Development Support
- Console Configuration Planning
- Fleetmap/ Talkgroup/ Personality Planning
- Development of all radio programming Personalities
- Application Training and Support

Training

Dispatch personnel are at the core of effective and efficient implementation of a radio system. While the time required for training is minimal, the payback is immense. Dispatcher training consists of console configuration training for dispatch supervisors followed by console operational training for dispatchers. Additionally, dispatchers can have unlimited access to web-based refresher training.

Console Configuration Training

This two-day course provides Carson City dispatch supervisors with the knowledge and skills to configure the Symphony Dispatch Console to meet operational needs. The training includes a detailed operational overview that introduces the various features and capabilities of the console. Dispatch supervisors will work within the configuration utility to explore the various settings including how these settings impact the operation of the console. With an understanding of the configuration utility settings, the supervisors will have the requisite knowledge to define the parameters that best satisfy operational needs. These settings will be saved and used as a template to set up additional consoles. Additionally, we will define the operating characteristics of the console, and will use the configuration editor to create setups to address the various functions required. This includes performing the following tasks:

- Adding, renaming, and deleting workspace tabs
- Designing communications modules (i.e., entities, colors, sizes, etc.)
- Adding, deleting, and moving communication modules
- Changing the sidebar panel layout
- Creating, switching, deleting, and password protecting console setups
- Setting encryption indicators and controls (if applicable)

This training will be conducted after the Symphony Dispatch Consoles are installed and made operational but prior to console operational training and cutover. Each dispatch supervisor will receive a copy of the training presentation and any applicable technical documentation. Harris will conduct this course one time for up to five participants at a designated dispatch facility.

Console Operational Training

Instructor-led, hands-on training sessions on the operation of the Symphony Dispatch Console are four hours in length. This training will be conducted using operational consoles installed at a designated dispatch location. Harris recommends limiting each training session to no more than two dispatchers per console to maximize the hands-on training. The training includes an overview of the new console system and the following tasks performed using the Symphony Dispatch Console, as applicable:

- Select communication modules
- Transmit and receive group and individual calls
- Transmit, receive, and clear emergency calls

- Review call history and play back audio
- Modify communication modules
- Create, modify, and transmit on patches and simulselects
- Control conventional channels
- Use the paging function
- Change console setups
- Use special and enhanced console features

Harris will conduct a total of six console operational training sessions over three consecutive days. The training sessions will be conducted just prior to cutover to allow participants to promptly begin using the skills learned. Each participant receives a hardcopy of the Symphony Dispatch Console Operation Quick Reference Guide.

Online Refresher Training

The importance of initial and refresher training for dispatchers is paramount to smooth and effective operations. Harris Technical University (HTU) consists of web-based training courses that effectively deliver ongoing training and reinforce knowledge transfer that took place during instructor-led training. Performance will improve, and the number of trouble reports reduced by enhancing the knowledge and skills of Carson City dispatchers on Symphony Dispatch Console operation. Additionally, HTU can augment training for new personnel due to turnover. A web-based training solution has numerous benefits that include the following:

- Training is accessible whenever needed (24 hours a day, seven days a week) from any location that has access to the Internet.
- Courses are self-paced, highly interactive, and developed using animation and other multimedia tools to help keep students engaged, which increases retention.
- It is cost-effective, especially when considering student or instructor travel and living expenses associated with attending standard classroom instruction.
- Training delivery is consistent and structured to ensure learning objectives are met.

Harris's proposal includes pricing for ten dispatchers to have unlimited access to the web-based Symphony Dispatch Console Operation Course for one year. The students will require a unique e-mail address, self-register, and create a unique username and password. The students will be able to access transcript information showing course progress and completion status and print a completion certificate once all course activities are completed.

Additionally, Harris will provide two personnel with one year of unlimited access to the following asynchronous training courses for system administrators/managers:

- P25 Fleet Mapping Overview
- XL-200P Radio Operation
- Symphony Console Operation
- Radio Personality Manager (RPM & RPM 2)
- Unified Administration System (UAS) Overview
- Regional Network Manager (RNM) Overview

- Radio Programming Overview
- Advanced Access Control (AAC)
- Active Directory
- Activity Warehouse
- Enterprise Network Manager (ENM)
- Over-The-Air Programming (OTAP)
- Over-The-Air Rekeying (OTAR) Fundamentals
- Inter-RF Subsystem Interface (ISSI) Fundamentals

Additional self-paced courses will be added to the asynchronous training program, as developed, at no additional cost to the City.

NetworkFirst Operation & Administration Training

This three-day course provides the Carson City technical staff with the knowledge and skills to configure and use the Unified Administration System (UAS) to manage the new console system. The training includes an overview of the features and capabilities of the system, and an introduction to equipment, components, and operational processes. Participants are also introduced to the Regional Network Manager (RNM), which is used to view network activity, monitor equipment status, and generate performance summary reports.

This course will be conducted on site at a facility provided by Carson City for a maximum class size of ten participants.

Warranty

Warranty Support

Harris provides a one-year warranty on all infrastructure equipment sold by Harris, and a two-year warranty on subscriber terminal equipment.

Warranty provides that the hardware and installation services furnished by Harris shall be free from defects in material and workmanship.

During the Warranty if any Hardware component or portion of the installation Services fails to meet the warranty, Harris will remedy by: (1) repairing any defective component of the Hardware, or (2) by furnishing any necessary repaired or replacement parts, or (3) by correcting the faulty installation at no additional cost to the Customer.

All warranty labor will be performed by Harris at our facility, for mobile or portable equipment.

Third-Party Warranties

Harris will ensure that warranty on any third-party Original Equipment Manufacturer (OEM) equipment and services sold by Harris meets the same warranty requirements and we will act on behalf of the Customer to coordinate and settle all warranty issues with any integrated third-party equipment or software companies throughout the warranty period.

Harris will transfer third-party warranties provided directly from equipment manufacturers to the Customer as part of the final acceptance.

Warranty Returns Process

Once the determination is made that equipment needs repair or replacement, we will follow these steps:

1. Technical Support creates a support case and will verify product part numbers, serial numbers and reasons for return and forward the approved request for processing.
2. A Customer Care Representative reviews all requests. We will provide an RMA number, required prior to return, along with a warranty replacement sales order number and instructions for return of the equipment.
3. Defective equipment ships back to Harris Depot Repair and Return.
4. We will repair or replace any equipment under warranty free of charge unless there is evidence of abuse or damage beyond the terms of the warranty.
5. Repaired or replaced unit ships back to the Customer.
6. We will close the RMA and update the tracking database

Requests for out of warranty repairs will require a purchase order. Out of warranty repairs are subject to a flat rate per unit fee regardless of fault found with the equipment. Turn-around time for equipment repair or replacement is generally 10 business days.

Depot Level Repair and Return

The Depot Repair and Return Facility in Lynchburg, Virginia maintains a staff of certified master technicians and support personnel who have over four decades of experience providing high quality repairs and fast turnaround times for public safety and commercial customers. This facility is ISO 9001: 2008 certified and UL Listed. Master technicians using state-of-the-art test equipment verify that all repairs meet or exceed prescribed specifications. The Depot Repair and Return Facility utilize a stockroom of common repair parts to reduce repair time. Our technicians can repair over 95% of radio and infrastructure equipment on-site, decreasing turn-around time. Customers are encouraged to call in advance regarding equipment returns to verify inventory and serviceability.

Demand Services

Demand Services consists of those services not included in our Scope of Work and shall be invoiced directly to the Customer on a time and materials basis. Such Demand Services include, but are not limited to the following:

- Installation or removal of mobile radio equipment after initial installation.
- Repair of equipment damaged by vandalism to the extent such equipment damage is not caused by Harris or any of its agents.
- Repair of equipment damaged by abuse or physical neglect to the extent such abuse or physical neglect is not caused by Harris or any of its agents.
- Damages due to acts of God or other uncontrollable events.

Exclusions

Standard exclusions apply as referenced in the following documents:

- Standard Conditions of Sale
- U.S. Equipment Warranty
- U.S. Battery Warranty

Premium Warranty

The following Premium Warranty services are provided during the one-year warranty period:

- On-site Corrective Maintenance with a 30-minute telephone response and a next business day on-site response, if needed.

Maintenance

A two-year maintenance agreement is proposed following the warranty period. The following services are provided during the two-year warranty period:

- Depot Repair and Return
- On-site Corrective Maintenance with a 30-minute telephone response and a next business day on-site response, if needed.

Please see Attachment C – Warranty/Maintenance - Statement of Work.

Service Assist

To ensure that the consoles have the most current and compatible software and operating system, and to perform the WINDOWS 10 upgrade when the system release software is upgraded, we have included Service Assist service package in our proposal. The following services are provided:

- Software Managed Service
- Premium Technical Support

Software Managed Services (SMS)

Software Managed Service (SMS) program provides new releases of system software tailored to each customer's system. These releases contain improvements and enhancements for current generation system software as well as occasional new product capability and the ability to enable licensed features. Keeping the infrastructure software up to date is vital to maintaining the value of the initial purchases so future capabilities such as Mission Critical PTT (MCPTT) can be deployed to the system's users.

Premium Technical Support

Continuous operation of a system providing critical communications leads customers to recognize the importance of having 24-hour-a-day, seven-day-per-week assistance. When the system malfunctions at 2 a.m., the personnel responsible for restoring operation are reassured when they have technical expertise available to assist.

Premium Technical Support (PTS) provides this assurance. PTS services from Harris offers comprehensive support 24/7, 365 days a year. PTS subscribers have toll-free phone access to Harris' Technical Assistance Center (TAC) that recognizes your call as a priority and includes a guaranteed two-hour response time if a technician is not readily available to answer the call. For emergency system off-air calls, a one-hour response time is guaranteed.

The TAC supports customers with answers to technical and user support questions about operations, programming, software, maintenance and troubleshooting issues with all supported Harris products. Harris Design Engineers and System Engineers supplement the technical expertise of support personnel when needed. Calls to TAC are logged and assigned a tracking number for more efficient handling of your specific situation and are added to our knowledge base to quickly resolve any future issues efficiently.

PTS also includes customer self-service access to the Harris Tech-Link website of technical information, technical bulletins and manuals with search engine support. Tech-Link provides on-line access to technical documentation, software release notes, and installation instructions of supported Harris infrastructure and terminal products. Tech-Link offers electronic retrieval/exchange of technical information and fast, easy access to product information and technical assistance.

Terms and Conditions

The terms and conditions of this quote are unique to Carson City as required by the circumstances surrounding the connection to the current NSRS Vida North Core. Unless noted otherwise, terms and conditions are governed by the Service Agreement Number P697-16-016 between Harris Corporation and Nevada of Department of Transportation dated 9/13/2018.

Functional Test Procedures
For
Carson City, NV
SR10A.4 Symphony Functional Testing

Rev –

Contents

ABOUT THIS DOCUMENT

This document was specifically prepared for the customer shown below. Each section of this document is individually maintained in the Harris Document Control System.

Customer: N/A

Prepared By: L. Dobbins

DOCUMENT USAGE

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

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

SUBSCRIBER UNIT USAGE

All tests for Subscriber (Terminal) Units in this document will be performed with Harris Subscriber Units unless the test setup identifies another Vendor's Subscriber Unit to be used.

1. FUNCTIONAL TEST ACCEPTANCE

This Functional Test Acceptance Procedure has been fully and successfully completed with all Action Items resolved.

Customer Representative	**Harris Corporation Representative**
Signature	Signature
Printed Name and Title	Printed Name and Title
Date	Date

FUNCTIONAL TESTING CLARIFICATION

Equipment Inspection and Testing in addition to Staging Acceptance Testing is performed at the Harris Staging Facility. Staging tests as detailed in this matrix verify basic equipment functionality in addition to its functionality as part of an overall system. Equipment as received from Harris and Third-Party Manufacturing Suppliers is supplied with Manufacturer Test Results, as applicable. Test results Documentation will be that from the Staging Functional Acceptance Tests. Equipment tests will be performed in the field after installation, both as part of equipment commissioning and overall Final Functional Acceptance Testing. Test results documentation will be from the Final Functional Acceptance Tests.

2. SYMPHONY DISPATCH FEATURE SET

2.1 Transmitting with a Microphone (Group Calls)

Purpose: **Demonstrate Symphony operator can initiate communication using Symphony select functions and foot pedal.**

Expected Results: **Confirms Symphony communication with Radio**

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

Execution:

1. Press INSTANT TX function (right mouse button) on module with test group.
   - ☐ Verify call is heard on radio.
   - ☐ Verify a ripple effect on 'TX' indicator is displayed.
   - ☐ Verify a channel access tone is heard.
   - ☐ Release the Instant TX key.

2. Right click on gear symbol for TG64002, and select 'Select' to make TG64002 the selected talk group.
   - ☐ Verify module for TG64002 is highlighted, indicating it is selected talk group.

3. Make a call on TG64002 by pressing PTT foot pedal.
   - ☐ Verify a channel access tone is heard.
   - ☐ Verify halo around the 'TX' indicator is displayed.
   - ☐ Verify call is heard on radio.
   - ☐ Verify audio is heard at radio on talk group TG64002.
   - ☐ Release foot pedal to end call.

4. Make a call on TG64002 by pressing headset button.
   - ☐ Verify a channel access tone is heard.
   - ☐ Verify halo around 'TX' indicator is displayed.
   - ☐ Verify call is heard on radio.
   - ☐ Verify audio is head at radio on talk group TG64002.
   - ☐ Release headset button to end call.

5. Make a call on TG64002 by selecting it with a mouse.
   - ☐ Verify a channel access tone is heard.
   - ☐ Verify halo around 'TX' indicator is displayed.
   - ☐ Verify call is heard on radio.
   - ☐ Verify audio is head at radio on talk group TG64002.
   - ☐ Release mouse button to end call.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		

2.2 Receiving Calls (Unit ID Display, Talk Group ID Display, Aliasing)

Purpose: **Confirm Symphony operator can receive communications from a Radio, using both talkgroup and individual calling.**

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

Setup: **Symphony has talk groups 64001 and 64002, programmed with 64002 selected, and Radio set to TG64001 P25**

2.2.1 Talk Group Call

Execution:

1. Key radio and verify
   - ☐ That call is heard at unselect speaker.
   - ☐ Calling radio ID is displayed on module for TG64001.
   - ☐ A green light ID displayed indicating an incoming call on module TG64001.

2. Switch radios talk group to TG64002 and key radio.
   - ☐ Verify call is heard at select speaker.
   - ☐ Verify calling radio ID is displayed on TG64002 module.
   - ☐ Verify a green light ID displayed indicating an incoming call on module TG64002.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

2.3 Alert Tones

Purpose: **Confirm Symphony can initiate alert tones which can be heard at Radio.**

Expected Results: **Tones can be initiated and heard.**

Setup: **Symphony programmed with TG64002 and TG64001 selected.**

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64002 P25	64002

Execution:

1. Make TG64001 P25 selected talk group.
2. Select tones tab on talk group module.
3. Select one of three ALERT TONE keys by selecting drop-down list next to orange button, using Symphony with a method other than the mouse.
4. Radio 1 will receive call.
5. Test all three alert tones to ensure all alert tones can be heard on radio.
   - ☐ Verify ALERT TONE is received by Radio 1, and is also heard on Symphony. (To hear tones on Symphony, press and hold foot pedal and listen for tone on SELECT speaker).
6. When ALERT TONE key is released.
   - ☐ Verify call on Radio 1 drops.

Results	(Pass/Fail) _____
Tester: _____	Date: _____
Comments: _____	
_____	
_____	

2.4 Console Pre-empt

Purpose: **Confirm Symphony can pre-empt an ongoing call between Radios.**

Expected Results: **Call started by the radio will be interrupted by the console.**

Setup: **Symphony programmed with TG: TG64001 P25**

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64001 P25	64001

Execution:

1. Key Radio 1 on TG64001 and hold call up. Verify that audio is heard at Radio 2 and Symphony.

2. Key Symphony on TG64001 and hold, while continuing to hold call up on Radio 1
   - ☐ Verify console pre-empts.
   - ☐ Verify transmit indicator is displayed along with pre-empted caller LID and CALL indicator.
   - ☐ Verify second radio begins to hear Symphony audio and not first radio call.
   - ☐ Verify pre-empted radio audio is still heard on pre-empting console.

3. Un-key first Radio.
   - ☐ Verify pre-empted caller LID and CALL indicators are removed, and pre-empted radio audio is no longer heard on pre-empting Symphony.

4. Un-key Symphony.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

2.5 Simulselect

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

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

Setup **Symphony programmed with TGs: TG64051 P25, TG64052 P25, TG64053 P25, and TG64054 P25.**

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64051 P25	64051
Radio 2	9980002	TG 64052 P25	64052
Radio 3	9980003	TG 64053 P25	64053
Radio 4	9980004	TG 64054 P25	64054

Execution:

1. Create Simulselect group on 4 test group modules.

2. Place a call from Symphony on Simulselect group.
   - ☐ Verify call is heard at all four radios.

3. Place a call from each radio.
   - ☐ Verify only Symphony hears calls.
   - ☐ Verify only radios on similar talk groups here call.

4. Deactivate Simulselect group.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

2.6 Patch

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

Expected Results: **Patched talk groups can communicate.**

Setup **Console 1 programmed with TGs: TG64051 P25, TG64052 P25, TG64053 P25, and TG64054 P25.**

Description	Radio LID	TG Description	TG ID
Radio 1	9980001	TG 64051 P25	64051
Radio 2	9980002	TG 64052 P25	64052
Radio 3	9980003	TG 64053 P25	64053
Radio 4	9980004	TG 64054 P25	64054

Execution:

1. Create patch on PATCH 1 with all four groups above.

2. Place a call from newly created patch.
   - Verify call is heard on all radios.

3. Place a call from each radio.
   - Verify call is heard on Symphony and each radio.

4. Deactivate patch.

Results (Pass/Fail) _____

Tester: _____ Date: _____

Comments: _____

_____

_____

2.7 Console to Console Cross-mute

Purpose: **Confirm creation of a cross-mute of another console to quiet the muted consoles audio on the local console.**

Expected Results: **Cross-muted console's audio cannot be heard on local console.**

Setup: **Establish two Symphony consoles, (A and B) to test Cross Mute function. Both Symphony consoles must be on same NSC. Program and select a test group on both consoles.**

Execution:

1. Place a call on console A on test group.
   - Verify console B can hear console A.

2. Open Symphony Configuration Utility for console B, in 'General' section, add ID for console A to 'Cross Mute' list.

3. Select 'Apply' to save changes.

4. Place a call on console A on test group.
   - Verify call can't be heard at console B.

5. Restore desired cross mute setup.

Results		(Pass/Fail)	
Tester:		Date:	
Comments:			

2.8 Call History

Purpose: **Confirms a history of calls processed at the Symphony.**

Expected Results: **History is accessible and valid.**

Setup: **Test compares programmed module call activity to history scroll lists.**

Utility page, dispatch menu will be selected. Select either "Select History" or "Unselect History".

Execution:

1. Press 'Scroll Up' and 'Scroll Down' buttons to scroll through Unselect Call History list. Compare these calls with known activity.

2. Press 'Scroll Up' and 'Scroll Down' buttons to scroll through Selected Call History list.
   - Compare these calls with known activity.

3. Press 'Esc' button to exit history scroll mode.

4. To monitor call history on a single group, use 'module history' button on 'module modify' menu.

5. Use 'scroll up' and 'scroll down' buttons to scroll through calls for picked module.
   - Compare these calls with known activity.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

3. VIDA INTER-OPERABILITY GATEWAY TEST

3.1 Local Interoperability

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

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

Setup:

Execution:

1. Select Inter-op group 1 on the radio.

2. Initiate a call from the radio to group 1
   - Verify that audio is heard on inter-op group 1 radio.

3. Initiate a call from the inter-op group 1 radio to group 1
   - Verify that audio is heard on the radio.

Results		(Pass/Fail)	_____
Tester:	_____	Date:	_____
Comments:	_____		
	_____		
	_____		

Harris is pleased to provide Carson City with the following firm fixed price proposal. Pricing is valid for 60 days from submittal date of April 30, 2019. This offer is based upon the enclosed terms and conditions.

TABLE B.14 - DISPATCH EQUIPMENT AND SERVICES

Table B.14.A - CARSON CITY DISPATCH EQUIPMENT

Item	Unit Price	Qty	Extended Price	Discount %	Discounted Price
Dispatch console - Symphony Console w/AES Ecrypt, 4 spkrs, 24" Touchscreen Monitor, 2 Headsets, and Desk Mic, Paging and Aux IO licenses	$ 62,790.00	6	$ 376,740.00	26%	$ 278,787.60
Console/System Interface Equip (Router/Switch)	$ 10,430.90	1	$ 10,430.90	26%	$ 7,718.87
User Radios - XG-100M Multiband CS-7000 Control Station High Tier with Remote SP721 Controller, PH 2, LLA, P25 Encryption, OTAP, OTAR, Mic, Enhanced Ant. System	$ 18,133.00	6	$ 108,798.00	26%	$ 80,510.52
UPS 60 Hz Power Supply	$ 3,020.00	6	$ 18,120.00	26%	$ 13,408.80
Interop Gateway w/16 talkpaths	$ 64,309.00	1	$ 64,309.00	26%	$ 47,588.66
			TOTAL CARSON CITY DISPATCH COST		**$ 428,014.45**

DISPATCH SERVICES

Table B.14.B - CARSON CITY DISPATCH EQUIPMENT

Description	Rate	Total
Installation and Programming	LS	$ 21,000.00
Engineering Proj Mgmt	LS	$ 84,373.00
Maintenance/Extended Warranty - Year 2	Annual	$ 21,434.00
Software Managed Service/Priority TAC - Year 1	Annual	$ 9,000.00
Software Managed Service/Priority TAC - Year 2	Annual	$ 9,000.00
Training - Console Configuration - On-site Two day class	LS	$ 9,975.00
Training - Console Operator - On-site three day class (Six 4 hour sessions)	LS	$ 14,200.00
Training - Web Based (unlimited access to web-based course for 10 students)	LS	$ 1,750.00
Training - Web-Based (one-year unlimited access for two System Administrators/Managers	LS	$ 3,000.00
Training – NetworkFirst Operation & Administration (three-day on-site course for up to ten students)	LS	$ 14,200.00
Removal of old equipment included in Install and Programming Price		
TOTAL CARSON CITY DISPATCH SERVICES		**$ 187,932.00**

TOTAL CARSON CITY DISPATCH EQUIPMENT AND SERVICES $ 615,946.45

Pricing Assumptions

The pricing provided is based on the following assumptions.

- Installing six Symphony consoles
- The existing T1 backhaul connectivity will be replaced with an Ethernet connection to support the proposed equipment
- The consoles have been configured to connect to the existing P25 VIDA switches.
- Each backup control station will have its own multi-band antenna installed on the roof top of the dispatch facility building.
- The control station transmission line length for antenna installation is between 125 feet to 150 feet.
- No hazardous material will be found at the sites.
- Site access roads are adequate for the delivery trucks that will travel to site.
- No prevailing wages, mandatory union workers, or mandatory minority business are required for the project.
- All work is priced based on normal working hours, 7:30 AM to 5:00 PM.
- At existing dispatch location, Carson City Public Works will:
  - Provide adequate desk space for the new consoles
  - Provide adequate electrical power and receptacles for the console equipment

Depot Repair, Onsite Corrective Maintenance, and 24x7 Response on Harris Infrastructure

This SOW is subject to the Agreement Terms and Conditions to which it is attached. The Services under this SOW are for the Equipment listed in the attached Equipment List.

Depot Repair and Return Harris Infrastructure

1.0 Harris Responsibilities:

1.1 Provide a Return Material Authorization ("RMA") within two (2) business days from the date of receipt of Customer's request.

1.2 Depot Repair and Return receipt and inspection.

1.2.1 Receive Infrastructure Equipment from Customer.

1.2.2 Verify against Customer submitted RMA.

1.2.3 Perform a visual inspection.

1.2.4 Perform an operational check to determine the nature of the problem and repairs required.

1.3 Standard Repair

1.3.1 Schedule the standard repairs to be made to the Equipment.

1.3.2 Make the required repairs and test the functionality of the repaired Equipment.

1.3.3 Package, ship, and return the repaired Equipment to Customer at Harris expense.

1.3.4 Provide a Summary Report, per repair as exemplified below, or another format as determined by Harris:

Repair Order	Date	Problem	Resolution	Resolution Date
123456	7/4/2017	No card communication.	Corrupt software. Reloaded. Passed communication tests.	7/4/2017

1.4 Standard Third-Party Original Equipment Manufacturer ("OEM") Equipment

1.4.1 Provide proper method for processing RMA against third party Equipment.

1.4.2 Track Equipment sent to the OEM.

1.4.3 Provide status updates to Customer.

1.4.4 Package, ship, and return the repaired Equipment to Customer at Harris expense.

1.5 Non-standard Repair

1.5.1 Harris may determine, in its sole discretion, that the repair of Equipment is not within the scope of Services of this SOW due to:

1.5.1.1 The unavailability of parts does not apply during warranty).

1.5.1.2 Equipment or part obsolescence (does not apply during warranty).

1.5.1.3 Extraordinary physical and other damages.

1.5.1.4 Equipment misuse, mishandling, improper storage, unauthorized Equipment modifications, detrimental exposure, or involvement in an accident (including without limitation liquid intrusions), Acts of God, including, without limitation, lightning damages.

1.5.1.5 Uneconomical cost to repair Equipment (does not apply during warranty).

1.5.2 If Harris determines, for the reasons set forth above, that the Equipment is not within the scope of Services of this SOW, Harris shall either:

1.5.2.1 Determine and provide to Customer an estimate of all additional charges required to perform repairs on the Equipment; or

1.5.2.2 Determine and provide to Customer an estimate of all additional charges for replacement equipment.

1.5.3 If Customer approves the additional charges, the repaired or replacement

Equipment shall be shipped to Customer.

1.5.4 If Customer disapproves the additional charges, Harris will charge a Diagnostic Fee and return the unrepaired Equipment to Customer.

1.6 Schedule

1.6.1 Standard Repairs – The time for completion for standard repairs is approximately ten (10) business days from the date of receipt of the Equipment to the date of shipment of the repaired Equipment to Customer.

1.6.2 Standard Third-Party Original Equipment Manufacturer ("OEM") Equipment Repairs- The time for completion for standard Third-Party OEM Equipment repairs is approximately thirty (30) business days from the date of receipt of the Equipment to the date of shipment of the repaired Equipment to Customer.

1.6.3 Non-standard Repairs –Non-standard repairs may take longer than standard repairs. Harris will notify Customer of any repairs that take longer than ten (10) business days.

1.7 Return Shipments to Customer

1.7.1 Equipment shipments shall occur as the individual RMA Equipment is repaired.

1.7.2 Multiple Equipment listed on a single RMA shall be shipped together to Customer if complete shipment is specifically requested by Customer.

1.7.3 Harris will properly pack outbound shipments and bears the responsibility for damage that occurs prior to delivery to Customer.

1.8 Depot Repair Warranty

1.8.1 Harris warrants that Equipment specifically repaired by Harris Depot shall be free from defects in materials and workmanship for a period of ninety (90) days from the date it is shipped back to Customer. If any repaired Equipment fails to meet the foregoing warranty, Harris at its option and expense (including the cost of any associated shipping) will correct the failure by (i) repairing any defective or failed part or parts thereof, or (ii) replacing the failed Equipment with an equivalent new or refurbished Equipment, or (iii) provide an equitable adjustment. The remedies under this Warranty section are Customer's sole remedies for any breach of warranty claims based upon defects in the equipment, whether the claim is in contract, warranty, tort (including negligence), and strict liability or otherwise, and however instituted. The foregoing warranties are exclusive and in lieu of all other warranties for the repairs, whether oral, written, expressed, implied or statutory. NO IMPLIED OR STATUTORY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE SHALL APPLY.

1.9 Harris Corrective Maintenance Responsibilities for Depot SOW

1.9.1 Request RMA using Harris provided process.

1.9.2 Follow the current RMA instructions, which may require Harris to include a copy of the RMA form inside the box, with clearly displayed RMA number on the outside of the box containing the Equipment being returned.

1.9.3 Pack Equipment adequately to prevent damages during transit.

1.9.4 Ship, at Harris expense, the Equipment listed in the RMA either to Harris' Depot Repair and Return or another mutually agreed facility.

1.9.5 If Harris technician wants multiple items listed on a single RMA to be returned together, Harris technician shall request complete shipment.

2.0 Customer Responsibilities:

2.1 Approve or disapprove additional charges within five (5) business days.

2.2 Pay a Diagnostic Fee if Customer disapproves the additional charges.

2.3 Contact Harris and arrange for advanced replacement at additional cost if the schedule is unacceptable.

2.4 Perform preventive maintenance, hardware, and software updates as recommended in the Equipment manuals.

Onsite Corrective Maintenance with Dispatch Harris Infrastructure

1.0 Harris Responsibilities:

1.1 For Harris and Third Party Equipment:

1.1.1 On-Site Troubleshooting:

1.1.1.1 Dispatching Harris personnel to investigate problem at Customer's location after remote diagnostics are made.

1.1.1.2 Perform pre-diagnostics to confirm malfunction.

1.1.2 Repair or replacement of failed Equipment per Harris determination:

1.1.2.1 If repairable, repair and perform testing to verify proper operation.

1.1.2.2 If replaceable, replace with Customer purchased Spare Part and perform testing to verify proper operation.

1.1.3 Shipment of failed Equipment to Harris or Third Party Depot Repair and Return ("Depot") for repair:

1.1.3.1 Obtain a Return Material Authorization ("RMA") from the applicable Harris or Third Party repair center.

1.1.3.2 Ship (at Harris' expense) Equipment to the Depot.

1.1.3.3 Manage and track repair status through the Depot process.

1.1.3.4 Receive and bench diagnose (where possible) repaired Equipment to meet original specifications.

1.1.4 Return of repaired Equipment:

1.1.4.1 Return repaired Equipment to original Customer location, install, and perform testing to verify proper operation.

1.1.4.2 If a Spare Part was used, return the repaired Equipment to the Spare Parts inventory.

2.0 Other Harris Responsibilities:

2.1 Purchase the replacement of the failed Equipment when not repairable.

2.2 Provide Customer with a Summary Report as part of a monthly reporting cycle as exemplified below, or another format as determined by Harris:

WO No.	Date	Problem	Resolution	Resolution Date
123456	7/4/2017	Router failed ping test at Ravens Rock.	Reset. Passed Ping.	7/4/2017

2.3 Provide quote to Customer for Demand Services repairs, if applicable.

2.4 Provide for repaired and returned equipment (i) a ninety (90) days warranty, or (ii) the remainder of the original warranty, or (iii) the third party warranty, whichever is greater.

2.5 Trained, experienced, and qualified technicians to provide Services on the Equipment.

2.6 Technicians will be equipped with the required tools, test, network, and computer equipment needed to troubleshoot and repair the Equipment. Test equipment requiring annual calibration will have affixed at all times, calibration stickers showing the expiration date of the calibration or the date next calibration is due.

3.0 Customer Responsibilities:

3.1 Provide Harris with a single point of contact for issues to which Harris responds.

3.2 Customer users experiencing an issue will notify Customer's single point of contact for issues. Customer's single point of contact will contact Harris.

3.3 Provide Harris unlimited, safe, physical and remote access to Customer sites and equipment to support delivery of service.

3.4 Notify Harris when there is any activity that impacts the system, Equipment, or Services.

3.5 Perform hardware and software updates as recommended in the Equipment manuals.

3.6 Within five (5) business days from receipt of Demand Services quote, approve additional charges for Demand Services repairs or disapprove Demand Services repairs and pay the diagnostic fee of the repair facility used.

3.7 Maintain Spare Parts in an environmentally controlled and easily accessible location.

3.8 Supply sufficient Spare Parts for Harris to provide Services.

3.9 In the event, Customer does not maintain sufficient Spare Parts to replace the failed Equipment while the failed Equipment is under repair and Customer desires a more rapid repair, Customer is to provide Harris a method to pay for expedited repair service or the procurement of an additional spare part.

3.10 Cooperate with Harris to provide the Services described in this SOW.

24x7x365, 30 Minute Response Harris Infrastructure

1.0 Harris Responsibilities:

1.1 Provide 24x7x365 on-call system technicians that are trained, experienced and qualified to provide Services on the Equipment.

1.2 Technicians will be equipped with the required tools, test, network, and computer equipment needed to troubleshoot and repair the Equipment. Test equipment requiring annual calibration will have affixed at all times, calibration stickers showing the expiration date of the calibration or the date next calibration is due.

1.3 Technicians will have transportation in good working order to reach the required locations.

1.4 On-call technician will receive notification of system issues by one of the following: System Notification, Self-Notification, or Customer Notification.

1.4.1 System Notification: Equipment may directly, or through an alarm monitoring system, determine there is an active alarm that requires immediate attention and notifies a Harris technician. Harris technician will self-dispatch or will notify the on-call technician of the issue. Harris technician will notify Customer's single point of contact of the issue and will advise time of call initiation and estimated next steps to resolution.

1.4.2 Self-Notification: Harris technician aware of an issue through use or other activities related to the Equipment will self-dispatch or will notify the on-call technician of the issue. Harris technician will notify Customer's single point of contact of the issue and will advise time of call initiation and estimated next steps to resolution.

1.4.3 Customer Notification: Customer's single point of contact will contact Harris per the Escalation Plan and Response Matrix.

1.5 The Escalation Plan:

1.5.1 Step 1

1.5.1.1 Technician: Customer's single point of contact will notify Harris on-call technician by placing a call to one of the following dependent on how local service personnel are notified:

1.5.1.1.1 Customer will call a defined local number that alerts the on-call technician via their cell phone or pager. The number that the Customer calls will remain constant and will be forwarded to the on-call technician. OR

1.5.1.1.2 Customer will call a defined local number for an answering service. The answering service will take Customer's name, number and reason for the call. The answering service will then contact the Harris on-call technician and will escalate until Harris personnel respond back to Customer.

1.5.1.2 If after ten (10) minutes the Harris on-call technician has not responded to the Customer's call, Customer will re-initiate the call to the Step 1 number again.

1.5.1.3 If after five (5) more minutes the Harris on-call technician has not responded to the Customer's call, Customer will proceed to Step 2.

1.5.2 Step 2

1.5.2.1 Supervisor: Customer will call a designated phone number for the Supervisor.

1.5.2.2 If after fifteen (15) minutes the Supervisor has not responded to the Customer's call, Customer will proceed to Step 3.

1.5.3 Step 3

1.5.3.1 Regional Service Manager: Customer will call a designated phone number for the Regional Service Manager.

1.5.3.2 If after fifteen (15) minutes the Regional Service Manager has not responded to Customer's call, Customer will proceed to Step 4.

1.5.4 Step 4

1.5.4.1 National Service Manager: Customer will call a designated phone number for the National Service Manager.

1.6 Provide Customer with a Summary Report as part of a monthly reporting cycle as exemplified below, or another format as determined by Harris:

WO No.	Date	Problem	Resolution	Resolution Date
123456	7/4/2017	Router failed ping test at Ravens Rock.	Responded per escalation process.	7/4/2017

24x7x365 Response Matrix

SEVERITY LEVEL	TYPE OF EQUIPMENT	RESPONSE TIME
Severity Level 1 (Major Failures)	➢ 25% of dispatching capability is inoperable ➢ Any major alarm that is leading to an inoperable state of 25%.	24x7x365 Within thirty (30) minutes to remotely respond to the problem. Arrive on site the next business day, if necessary.
Severity Level 2 (Moderate Failures)	➢ Moderate issues that prevent Customer's normal use of Equipment. ➢ Individual dispatch console inoperable	24x7x365 Within thirty (30) minutes to remotely respond to the problem. Arrive on site the next business day, if necessary.

SEVERITY LEVEL	TYPE OF EQUIPMENT	RESPONSE TIME
Severity Level 3 (Non-Emergency)	➢ Minor alarms that do not prevent or prohibit use of Equipment ➢ Operational, parts, and configuration questions ➢ Site environmental alarms ➢ Intermittent problems being reviewed or monitored that are not resulting in a Severity Level 1 or Level 2 issue ➢ Administrative issues	Next Business Day Within the next business day, begin to remotely interrogate the problem and arrive on site the second business day, if necessary.

2.0 Customer Responsibilities:

2.1 Provide Harris with a single point of contact to notify of issues to which Harris responds.

2.2 Customer users experiencing an issue will notify Customer's single point of contact for issues. The Customer's single point of contact will contact Harris per the Escalation Plan and Response Matrix.

2.3 Provide Harris unlimited, safe, physical and remote access to Customer sites and Equipment to support delivery of Services.

2.4 Provide the following information when initiating a service request:

2.4.1 Severity Level as per the Response Matrix.

2.4.2 Problem description and site location.

2.4.3 Information regarding Group ID, Unit ID and functionality impacted.

2.4.4 Provide contact information on user reporting issue, location of user reporting issue, and time experienced.

2.4.5 Other pertinent information requested by Harris.

2.5 Notify Harris when there is any activity that impacts the system, Equipment or Services.

2.6 Cooperate with Harris and perform all efforts that are necessary to enable Harris to provide the Services to Customer.

3.0 Additional Conditions Regarding Site Access and Response Times:

3.1 On-site Response Times are based on the assumption that the site is accessible by normal transportation methods and vehicles. On-site Response Time requirements exclude site locations that require extensive drive time due to traffic conditions or site locations where specialized vehicles are required**.**

3.2 Customer is responsible to ensure that all necessary clearances, escorts, ID cards, network access requirements including custom software or security credentials, or other special requirements have been provided to Harris in advance to allow technicians prompt access to any Equipment requiring service that may be located in a secured or limited access area under Customer's control.

3.3 Customer agrees to provide Harris an appropriate work environment and unlimited access, working space including heat, light ventilation, electric current and outlets, and local wireless and telephone access for the use of Harris' service personnel in the Equipment's physical location.

3.4 Customer shall be billed at Demand Services rates for time lost or changes due to any delay caused by Customer in the provision or execution of the Services.