

CONTRACT MODIFICATIONS # 18

CONTRACT MODIFICATIONS #5 OPTION B

SECTION 3A – STATEMENT OF WORK

3.0 Overview

This Subsystem Integration Statement of Work (SOW) describes the Division 1 deliverables to be furnished by Motorola to the Commonwealth, and the tasks to be performed by Motorola, its subcontractors, and the Commonwealth in order to implement the Commonwealth of Virginia MOTOBRIDGE IP Interoperability Solution. This SOW contains information that describes the most current understanding of the work required by both parties in order to provide a successful subsystem implementation.

Motorola understands that the Commonwealth intends to utilize the local dispatch centers to complete many of their tasks. However, since these local dispatch centers are not a party to the STARS Contract and, as a result, all tasks are shown in this SOW as the Commonwealth's and/or Localities responsibility. It is the Commonwealth's responsibility to ensure that these tasks are completed in accordance with the corresponding dates. It is also the Commonwealth's responsibility to secure the partnership of the localities including all Memorandum of Understandings (MOUs). Motorola will assist in whatever capacity the Commonwealth needs in order to get the local dispatch centers "on board," except for negotiation of the MOUs. The cooperation of and access to the local dispatch centers is critical to completing this subsystem in the timeframe desired by the State.

It is understood that this SOW may be revised via Contract Modifications that may occur during the execution of the subsystem. If there are changes to the scope of work, then these changes must be reflected in this SOW before becoming binding on either party. Changes to this SOW have been made through the Contract Modification process, as set forth in the Contract.

3.1 Subsystem Implementation Work Plan

Motorola has developed the implementation plan contained herein, for most efficient utilization of resources and earliest possible completion of the subsystem.



3.1.1 MOTOBRIDGE IP Division 1 Assumptions

3.1.1.1 Engineering Assumptions:

- The design of this subsystem assumes a maximum of four (4) radio / communications equipment connections per County, City, or VSP Division Headquarters. Motorola will provide control stations compatible with an existing site's radio system as identified in agreed-to site designs (total of 3 control stations). In addition, Motorola will provide a console module interface, as identified in agreed-to site designs, with the existing radio system to access STARS and other localities. Localities access to STARS resources will be programmed to be under the control of a VSP division dispatcher.
- Each remote site will connect to COVANET or equivalent with a minimum 512 kbps Wide Area Network (WAN) circuit. The 1st Division Headquarters site will connect over the STARS Microwave Network.
- COVANET or equivalent IP network connectivity to each site will be provided by the Commonwealth and/or Localities.
- The STARS Microwave Network will be used for communications from Division 1 Headquarters to the STARS Network Operations Center (NOC).

3.1.1.2 Commonwealth and/or Localities requirements:

- Rack space for installation of equipment
- All electrical, heat, and air conditioning.
- Grounding to Motorola R-56 standards, if practical.
- RJ-45 WAN/LAN connection within 10 feet of equipment, if practical.
- Links between all LAN routers at STARS NOC and SPHQ.
- IP addresses prior to Staging.
- Site walks with Motorola Engineer.
- Code of Federal Regulations (CFR) 47 documentation concerning the sharing of radio frequency authorizations.

3.1.2 Kickoff Meeting

After execution of Contract Modification #5, the implementation process began with a subsystem Kickoff Meeting. This meeting introduced members of the Motorola's Implementation Team and established the point of contact with the Commonwealth's subsystem project team. This meeting helped to clarify the subsystem design, identify any special product requirements and their impact on subsystem implementation, and



refine the subsystem implementation plan. Finally, this meeting allowed the team leaders to assign an initial list of subsystem project tasks to appropriate team members.

3.1.3 Contract Design Review (CDR)

The schedule demanded highly coordinated efforts between Motorola and the Commonwealth to implement the subsystem. Therefore, shortly after the Kickoff Meeting, Motorola conducted a Contract Design Review (CDR) of the proposed subsystem design. The goal of the CDR process is to finalize agreement on the overall subsystem design. A discussion of the implementation plan and methods to document a detailed procedure for implementation began at this meeting. During the CDR, Motorola provided the following documents to the Commonwealth for its review and approval, within ten (10) business days of receipt.

- Subsystem Description
- Equipment List
- Subsystem Block Diagrams
- Preliminary Rack Elevation Drawings
- Preliminary Network Transport Plan
- Preliminary Acceptance Test Procedure
- Preliminary Implementation Plan
- Preliminary Subsystem Project Schedule

After the CDR, the Commonwealth provided Motorola the following deliverables, listed in Section 3.1.4 below, for all dispatch centers. The conclusion of the CDR was Motorola's automatic authorization to proceed with the subsystem implementation.

3.1.4 Dispatch Center Site Survey

For each dispatch center, the Commonwealth and/or Localities completed to the best of their ability a site survey, which evaluates all locations for both physical and technical attributes. This survey was needed prior to Motorola conducting site walks. The survey should contain, at a minimum, the following information:

- Key local decision making contact with authority to:
 - Determine what equipment goes in the dispatch center and where.
 - Coordinate site walks.
 - Schedule installation and implementation.
 - Determine routing of wiring between dispatch area and equipment rack.



- Determine the radio system, channel or talk group to be assigned to each control station.
- Determine available space for:
 - Location for one computer workstation with a 15-inch flat panel monitor in dispatch area.
 - Equipment room space for one (1) complete 7-foot high, 19-inch wide rack, or twelve (12) inches of existing 19-inch EIA vertical rack space.
- Confirm if radio dispatch is conducted at the location.
- Determine if there is a Commonwealth COVANET or equivalent IP network presence at the dispatch center, including:
 - Telephone.
 - STARS to provide COVANET or equivalent IP network connection at all locations.
 - Location of demark point.
- Determine if each dispatch center has adequate electrical, grounding, heat, and air conditioning.

3.1.5 Ordering and Manufacturing

After the CDR meeting, Motorola processed orders for equipment and started the equipment manufacturing process.

3.1.6 Dispatch Center Authorization

The Commonwealth provided to Motorola a list of all dispatch centers with completed Locality MOUs pursuant to the mutually agreed subsystem project schedule. Motorola used this list as a tool for prioritizing the IP network rollout and the dispatch center installations.

3.1.7 Site Access

The Commonwealth and/or Localities provided reasonable access to all dispatch centers as defined in Section 3.1.6 above. Access was coordinated in advance, 24 hours a day, during the course of this subsystem project. This may include, but is not limited to, the following:

- Motorola will use one VSP-cleared person to escort the work crew at each site. The Commonwealth will provide escorts at no charge, if VSP escorts are required at any particular site. The availability of such escort will not be unreasonably withheld.



- The Commonwealth and/or Localities will arrange site access and provide keys/combinations to all the locks, or an escort to provide access.
- All Motorola employees and Motorola subcontractors that enter a site, or have contact with STARS programmed equipment, must have previously passed a VSP background check and will be responsible for any persons that have not had a background check that accompany them on the premises.
- Arrange for security procedures, clearances, passes, keys/combinations, etc., in the line of subsystem project work enabling Motorola and subcontractor personnel access to necessary Commonwealth facilities.

3.1.8 Dispatch Center Site Walks

Upon completion of the CDR and with the Commonwealth and Locality concurrence, Motorola commenced site walks at each location. These site walks are intended to accomplish the following:

- Review site conditions such as available electrical, grounding, HVAC, etc., and identify any necessary upgrades.
- Review the existing equipment layouts and identify if the relocation of any existing equipment is necessary.
- Determine final installation location of all MOTOBIDGE IP equipment.
- Review cable installation, routing, conduit runs required, and required lengths.
- Determine COVANET or equivalent IP network status and location of demark if existing.
- Define demark point in the equipment room for connection to COVANET or equivalent IP network if it is not present and is required at the site.
- Confirm the radio system, channel or talk group assigned to each control station.
- Identify the dispatch console for connection as the primary means of accessing the MotoBridge network.

A final report for each dispatch center was generated and submitted to the Commonwealth.

3.1.9 Site Acquisition, Construction and Site Development

During the manufacturing and staging process, the Commonwealth will ensure that all dispatch center locations are ready for installation when the equipment is delivered by Motorola in accordance with the agreed-to schedule.

The Commonwealth is solely responsible for completing all Locality MOUs for the equipment installation. The Commonwealth is also responsible for ensuring that the dispatch centers complete any agreed-to site preparation work prior to the equipment



delivery date. Delays due to the completion of the Locality MOUs, site development, and permitting requirements will be cause for extension of the schedule on a day-for-day basis, which will be memorialized through a Contract Modification.

3.1.10 Construction Permits and Zoning

The Commonwealth and/or Localities will be responsible to obtain the required local building permits for the work provided by Motorola. Permits required for work other than provided in Contract Modification #5 or work being performed at sites by the Commonwealth will be the Commonwealth's and/or Localities responsibility.

The Commonwealth and/or Localities will be responsible for all zoning issues, including but not limited to, permits, waivers, easements, and right of way clearances, EPA/DEP requirements, or any other requirements of local, state, or federal regulations with regard to the permission to develop these sites. Motorola will provide a price proposal for these services if the Commonwealth requests.

3.1.10.1 Site Conditions

At the dispatch center locations (whether owned by the Commonwealth, its agents, or local governments), the Commonwealth and/or Localities will work to ensure that the following is completed **prior** to the scheduled equipment delivery dates:

- Supply, if required, adequately sized electrical service, backup power (UPS, generator, etc.) including the installation of conduit, circuit breakers, outlets, etc., at each equipment location. Provide AC power (two [2] 20 Amp quad AC outlets – simplex with ground with dedicated circuits preferred) for each major piece of equipment (WS-GU and RG-U) within 6 feet of the location of the Motorola supplied equipment, including the associated electrical service and wiring (conduit, circuit breakers, etc.).
- Provide adequate HVAC, grounding, lighting, cable routing, and surge protection in accordance with Motorola's R-56 installation standards if practical. Ceiling and cable tray heights in the equipment rooms should be such as to accommodate 7-foot equipment racks.
- Provide floor space and desk space for the supplied equipment under this Contract Modification #5 in the dispatch centers.
 - Space for a WSGU, desktop computer, monitor and keyboard.
 - Space for installation for a RGU and control stations that allows proper operation and serviceability. Motorola will provide up to 100 feet of transmission line for the control stations.
 - Space for associated routers and network equipment.
- Relocate existing equipment, if required, to provide space for the installation of Motorola-supplied equipment.

- Provide grounding subsystem up to Motorola's R-56 Standards, if practical, and supply a single point subsystem ground, of five ohms or less, to be used on all fixed equipment supplied under this Contract Modification #5. Supply grounding tie point within ten (10) feet from the Motorola-supplied equipment.
- Provide obstruction free area for the cable run between the demarcation point and the communications equipment.
- Provide and supply wall penetrations and conduit where required for control cables or antenna cables.
- Resolve any environmental issues including, but not limited to, asbestos, structural integrity of the site and any other building risks. Any work by Motorola to resolve any environmental or hazardous material issues will be handled through the Contract Modification process.
- Supply all permits as required by Contract.
- Supply interior building cable trays and wire supports.
- Supply engineering and drafting as required for modifications to existing building drawings for site construction.

Motorola began work with written mutual agreement of the parties that the dispatch center is deemed ready, and is released by the Commonwealth. At a minimum, Site Ready shall consist of adequate room in an existing building or shelter to accommodate the equipment to be installed, electrical service, internal distribution in place, and all site requirements detailed in this Contract Modification.

The Commonwealth and/or Localities will ensure that all work sites it provides will be safe, secure, and in compliance with all applicable industry and OSHA standards. To the extent applicable and unless the Statement of Work specifically states to the contrary, the Commonwealth will ensure that these work sites will have (i) physical space for the installation, use and maintenance of the Subsystem, as set forth in this section of this Contract Modification,; (ii) adequate air conditioning and other environmental conditions; (iii) electrical power outlets as noted in this section of this Contract Modification, distribution and equipment for the installation, use and maintenance of the Subsystem; (iv) adequate telephone or other communication lines for the installation, use and maintenance of the Subsystem, including modem access; and (v) adequate interfacing networking capabilities.

3.1.11 Staging

Motorola staged a representative quantity of equipment that comprises a subset of the MOTOBRIDGE IP Interoperability Solution.

Motorola used this staged equipment to verify operational functionality.



Motorola and the Commonwealth mutually agreed in writing on the physical set up and the location of hardware, based on approved equipment layout plans. All cables will be cut and labeled with to/from information to clarify interconnection for field installation. All provided equipment cables will be connectorized and tested.

After assembling the equipment, the staging technicians will power-up the equipment, load software, and optimize the equipment. Subsystem software and subsystem features will be tested; end-to-end functionality will be verified. Once the subsystem has been assembled, optimized, and integrated as a complete working unit, the subsystem will be tested according to the staging acceptance test procedures.

Upon satisfactory completion of mutually agreed upon tests, Motorola coordinated with the Commonwealth for a factory visit in Schaumburg, IL to witness the testing. This visit provided the Commonwealth the opportunity to view a representative sample of the subsystem assembled and working as an integrated subsystem. Functionality and features of the communication subsystem that are capable of operation in a factory environment were tested and verified by Motorola for the Commonwealth.

The Commonwealth was responsible for all costs associated with all travel, lodging, incidentals, and meal costs for the Commonwealth's personnel and representatives to witness the Factory Acceptance Testing during the staging.

3.1.12 Delivery to the Field and Inventory

Initially, all equipment, whether staged or not, will be delivered to a predetermined storage location within the Commonwealth at Motorola's expense. At this location, Motorola will inventory the equipment prior to installation at the dispatch centers. The Commonwealth provided personnel to verify the Motorola-supplied inventory for all received goods. MOTOBRIDGE IP application software will be loaded in the workstations while at this location. Access to the Commonwealth's dispatch center locations by Motorola and its subcontractor's personnel will be arranged by the Commonwealth prior to the dispatch center delivery dates.

3.1.13 Dispatch Center Transport Installation

The Commonwealth provided transport for network connectivity between the fourteen (14) dispatch centers specified in this Contract Modification through the Commonwealth's COVANET network or equivalent IP network. The transport mechanism (access and port charge) will consist of, at least, 512 kbps circuits to all dispatch centers requiring four (4) talk paths. The 1st Division Headquarters site will use the STARS Microwave Network to SPHQ where the STARS NOC is located. The STARS training center will utilize the Commonwealth provided LAN connectivity at SPHQ to connect with MOTOBRIDGE equipment in the STARS NOC. The Commonwealth coordinated with the 14 localities to order all connections to COVANET or equivalent IP network. The Commonwealth was responsible for network usage charges for the first year. Subsequent years will be the responsibility of the localities.



Localities' COVANET or equivalent IP network connections will terminate at STARS NOC.

Motorola provided router equipment at each dispatch center location. These routers will be equipped with at least two (2) Ethernet ports, providing the required interface between Motorola's R-GU/WS-GU and the circuits. In addition to the two Ethernet ports existing on the router, Motorola will provide an external Ethernet switch at each of the 14 remote sites.

The Commonwealth was responsible to provide the location for the proposed IP network equipment. The location must be in a secure, environmentally controlled room. This room must have space for the proposed IP networking equipment and rack, in accordance with all applicable electrical, fire and safety codes (see Section 3.1.10.1 above for minimum requirements).

It is understood for purposes of this Statement of Work that any equipment to which the proposed IP networking equipment will connect will be within thirty-three (33) feet. In addition, it is understood that the IP network demarcation will be within this room.

3.1.14 Fixed Equipment Installation

Motorola managed the dispatch center field installation phase of this implementation using multiple implementation and installation teams.

Motorola was responsible for the installation of all fixed equipment contained in the equipment list, per the agreed-to layouts and the schedule mutually agreed to by the Commonwealth and Motorola. All provided equipment was properly secured and installed in a neat and professional manner.

All Motorola provided equipment was properly grounded to the site's existing grounding subsystem. Motorola utilized appropriate connectors, and assemble the cables per the manufacturer's specifications.

Motorola connected audio and control cables from Motorola supplied equipment and demarcations to the Commonwealth provided demarcation blocks for network interfaces.

During field installation of the equipment, any required changes to the installation were noted and assembled with the final 'as-built' documentation of the subsystem.

3.1.14.1 Dispatch Center

At each of the fourteen (14) dispatch center locations, Motorola provided the following:

- One (1) site router that will be equipped with at least two (2) Ethernet ports, providing the required interface between Motorola's R-GU/WS-GU and the COVANET or equivalent IP network circuits. In addition to the two (2) Ethernet ports existing on the router, Motorola will provide an external Ethernet switch.

- One MOTOBRIDGE IP dispatch workstation, which consists of a computer workstation and one (1) 15-inch flat panel LCD monitor. This will be installed in the call center location.
- One (1) Workstation Gateway Unit (WS-GU) at each dispatch center location will be installed with the dispatch workstation.
- Radio Gateway Unit (R-GU) equipment at each of the dispatch center locations that will interface into a 4-wire circuit or directly to the site's dispatch console for the radio system and/or any Motorola control station as identified in agreed-to site designs. The demarcation point provided by the Commonwealth will be a punch block for base station and console connections. Control stations can be connected directly to the R-GU, depending on the proximity, up to 6ft, of the two pieces of equipment.
- One (1) console interface per locality for remote locality and/or STARS access.

Additional equipment being provided at the 1st Division Headquarters and the STARS NOC:

- Three (3) Ethernet switches will be provided; one (1) will be installed at the 1st Division Headquarters, and two (2) at the main STARS NOC location.
- Three (3) Network routers will be provided; one (1) will be installed at the 1st Division Headquarters, and two (2) at the main STARS NOC location.
- One (1) Operations and Maintenance Center (OMC) Server will be provided and installed at the STARS NOC.
- One (1) SIP server will be provided and installed at the STARS NOC.
- One (1) Firewall will be provided and installed at the STARS NOC.
- Two (2) Administrative Control Panel (ACP) PCs will be provided: one (1) at STARS NOC and one (1) as a spare.
- The routers, R-GU and any control stations will be installed in the equipment back room at each dispatch center. The Commonwealth and/or locality will provide rack space for this equipment.
- Motorola has included the cost for three (3) control stations for interfacing to R-GUs.
 - Two (2) control stations for the STARS training center.
 - One (1) control station for the Henrico County dispatch center compatible with the county's radio system.



- Motorola has included the cost for fourteen (14) Motorola BIMM and two (2) Motorola Command Plus modules for interfacing to R-GUs as identified with agreed –to site designs.

3.1.14.2 Control Station Installation

Motorola installed the control station radios contained in the attached equipment list at the dispatch centers identified by the Commonwealth. As part of this installation, Motorola will install an antenna and RF cabling (up to 100 feet of coax per antenna) for the control stations. The cabling will be properly connectorized, grounded, and will be run via the least obtrusive way to the outdoor antenna location. The cabling will be protected by a bulkhead lightning surge protector. Control station installations are based on installation hardware contained in the proposed equipment list. It has been assumed that plenum cable and conduit are not required for these installations.

Cable entry into the building will be through a Commonwealth-provided wall feed through and sealed with silicone, unless Commonwealth provides an entry plate and boot. Once the exact mounting locations are surveyed, any deviations from the proposed control station installation plan will be handled through the contract modification process. Motorola will perform the following tasks for the local control station installations:

- Create installation plan.
- At each site, assist Commonwealth in determining the locations of the control stations.
- Install RF local control stations.
- Install line (not greater than 100-feet in length) and antenna subsystem (connectors, coax grounding kit, antenna, and surge protection).
- Connect to Commonwealth's and/or locality supplied ground point within ten (10) feet of unit, if practical.
- Any Motorola-provided control stations will be programmed once prior to delivery from a template that will be approved by the local dispatch center and the Commonwealth, to ensure custom talk group or channel assignments and option capabilities, if required.

The Commonwealth and/or Localities will perform the following tasks for control station installations:

- Provide space as necessary for installation of the local control station. The local control station requires a flat surface upon which to place the control station.
- Supply exterior or internal, vertical spaces, for installation of the control station antenna that is no more than 100 feet in length.
- Provide for RF cable entry into the building via either a wall feed through or an entry port and boot.
- Supply a 115 VAC grounded electrical outlet rated at 15AMPS to power the control station and remote control device. A dedicated outlet is preferred. An outlet must be provided within six feet of the unit.
- Supply an adequate ground point located in the immediate vicinity (10 feet, if practical) of the finalized location of the antenna and control station.
- Provide antenna mounting facilities at each of the RF control station points specified, while providing an adequate means of feed-line routing and support.

Interference:

Motorola will correct mutual radio interference between this subsystem and any other system installed within the Commonwealth of Virginia when it is a direct result of Motorola's equipment failing to perform to FCC requirements and/or the improper installation and optimization of said equipment. Motorola will provide the appropriate resources to assist the Commonwealth in identifying interference problems with other systems located within the Commonwealth when the fault is not due to Motorola's performance; however, it will be the responsibility of the Commonwealth and/or Localities to implement any corrective actions to resolve the interference problems.

In order to minimize such interference, Motorola will design the system utilizing industry standard engineering practices and techniques.

3.1.14.3 Console Interface Installation

If a customer has selected to integrate the MOTOBRIDGE solution to their existing dispatch console rather than or in addition to utilizing control stations as donor radios, Motorola will install necessary console interface modules as identified in the contracted equipment list, and will provide engineering and installation services to accommodate the customer with the capacity available.



3.1.14.4 Console and Workstation Furniture

Motorola is not providing any Console or Workstation furniture as part of this Contract Modification.

3.1.15 Dispatch Center Equipment Optimization

Once the hardware was installed and connected, Motorola provided programming, testing, and optimization of each dispatch center location. Audio level adjustments for base stations and control stations connected to the network will be set on the R-GUs.

3.1.16 Functional Dispatch Center Acceptance Test Plan

Upon completion of the equipment optimization, functional Acceptance Testing of the dispatch center equipment will begin in accordance with the mutually agreed to Acceptance Test Plan (ATP). Motorola conducted a Functional Acceptance Test to verify the operational functionality. In the event that any task fails in the initial test, that particular task will be retested when Motorola determines that corrective action has been taken. All issues that arise during the Acceptance Test will be documented and resolved before the subsystem is considered ready for integration into the system. Motorola will document the results of this Acceptance Test and provide a copy for review by the Commonwealth.

3.1.17 Subsystem Acceptance / Punch list

Subsystem Acceptance will be on a site-by-site basis.

After the successful completion of the Subsystem Acceptance Test, the Commonwealth began to use the subsystem for its day-to-day operation. Subsystem Acceptance will occur upon the installation, optimization, and successful completion of the Functional Acceptance Tests, which apply to the specific subsystem, or upon "Beneficial Use," whichever occurs first. "Beneficial Use" means use of the subsystem for operational purposes, other than for training or testing. If the Commonwealth commences Beneficial Use of the subsystem prior to Subsystem Acceptance, Final Acceptance for said subsystem will have occurred. The warranty period for the subsystem will commence upon the date of Subsystem Acceptance or Beneficial Use of the subsystem, whichever occurs first (see Section 4).

During Subsystem Acceptance testing, a 'punch list' will be generated noting any corrections that may be required to be made prior to Final Subsystem Acceptance. A resolution to each punch list item will be mutually agreed to and a period for satisfactory completion will be noted. When punch-list items have been resolved, and the final documentation delivered, the Commonwealth and Motorola will execute a Final Subsystem Acceptance document.

3.1.18 "As-Built" Documentation

Motorola will provide as-built drawings –one (1) for each of the dispatch centers plus one (1) copy of a subsystem manual for the Commonwealth, both in soft and hard copy. The documentation provided will be appropriate to the scope and complexity of the particular installation performed as mutually agreed.

3.1.19 Final Subsystem Acceptance

The Commonwealth will grant Final Site and Subsystem Acceptance to Motorola when all contractual commitments by Motorola have been completed.

3.1.20 Subsystem Specific Responsibilities/Roles

Motorola's equipment list and work defined in this SOW are based on certain tasks being performed by the Commonwealth and/or Localities. These tasks complement the tasks listed in the Subsystem Task Matrix (Section 3.1.22 below). This responsibility matrix details the tasks that are to be completed by both Motorola and the Commonwealth and/or Localities in order to complete the implementation successfully. The primary goal of the responsibility matrix is to define who is responsible for completing specific tasks and sub-tasks.

3.1.21 Additional Commonwealth and/or Locality Responsibilities

In addition to the responsibilities shown on the Subsystem Task Matrix and those items listed above, there will be other involvement and participation needed by the Commonwealth subsystem project staff and other Commonwealth personnel that are not shown in each activity in the schedule. These responsibilities/roles will include, but are not limited to, the following:

- The Commonwealth was responsible to identify, qualify, and secure or obtain MOUs for all dispatch center locations it proposes to use in the new MOTOBRIDGE IP Interoperability Solution. All costs for preparing these dispatch center facilities for equipment installation for this subsystem are the sole responsibility of the Commonwealth and/or Localities and have not been included in this Contract Modification. If for any reason, any of the proposed dispatch centers cannot be utilized, due to reasons beyond Motorola's control, the costs associated with location changes or delays including, but not limited to, re-engineering, schedule delays, site abnormalities, re-mobilization, etc., will be identified in a 'Memorandum of Change', including the associated costs, and will be memorialized through a Contract Modification.
- The Commonwealth provided all IP addresses needed for the subsystem prior to staging.

- Make any necessary arrangements for contacts, key meetings and exchanges of information with Commonwealth personnel outside of the immediate Commonwealth subsystem project staff.
- Provide personnel to participate in the acceptance testing.
- Provide existing subsystem information in support of design considerations and equipment interface activities.
- Provide training facilities for the training of Commonwealth and locality dispatch center personnel. Motorola will provide the training equipment. If more training equipment is required, spares can be utilized to fill the equipment shortfall. In addition, localities equipment being installed in the later stages of the project could be utilized. Training equipment included in this Contract Modification includes the following:
 - Two (2) WS-GUs
 - Two (2) R-GUs
 - One (1) Ethernet Switch
 - Two (2) Workstations
- Participate in defining and scheduling the Commonwealth and locality dispatch center personnel that will participate in the training classes described in the training plan.
- COVANET network or Commonwealth-provided equivalent IP network performance must adhere to the following specifications to ensure proper operation:
 - 512 kbps minimum
 - Symmetrical connectivity technology
 - Static IP Address Scheme
 - Packet Jitter < 50 msec (recommended)
<100 msec (supported)
 - Packet Delay < 300 msec (recommended)
< 400 msec (supported)
 - Packet Loss < 2%
 - No Network Address Translation/Network Address Protocol Translation (NAT/NAPT)

3.1.22 SUBSYSTEM TASK MATRIX

The subsystem task matrix illustrates specific task ownership between the Commonwealth, Localities, and Motorola.

TASK	TASK OWNER			COMMENTS
	MOT	Comm. of VA and/or Localities		
CONTRACTUAL				
CONTRACT MODIFICATION #5 NEGOTIATIONS				
Finalize subsystem design	x	x		
Finalize subsystem scope of work	x	x		
Finalize subsystem project schedule	x	x		
CONTRACT MANAGEMENT				
Inspect and approve deliverables, certify milestones and payments		x		
Certify final acceptance		x		
INTEROPERABILITY PREPARATION				
Develop MOUs with Localities		x		
Determine IO features to be implemented	x	x		
Define IO talk groups		x		
Develop other equipment requirements	x			
DISPATCH CENTER SITE PREPARATION				
Define equipment layout and space requirements from the standard in this Contract Modification.	x			
Site surveys/audits	x	x		
Approve equipment layout drawings	x	x		
Order telco service to network		x		
Provide and install AC line surge protection	x			

TASK	TASK OWNER			COMMENTS
	MOT	Comm. of VA and/or Localities		
Provide and install circuit line surge protection	X			
Define AC power requirements from the standard in this Contract Modification.	X			
Provide appropriate AC power within six feet of each piece of equipment		X		
Provide space for installation and maintenance of equipment defined in this Contract Modification.		X		
Provide required site upgrades		X		
Provide intra-building cable access between equipment rooms		X		
Implement power upgrades		X		
DISPATCH CENTER INTER-SITE COMMUNICATIONS				
Define circuit requirements and specifications	X			
Provide circuit links between dispatch center's and COVANET or equivalent		X		
Cross connect from equipment to punch block	X			
Telco installation and usage charges		X		
SUBSYSTEM STAGING				
General equipment layout drawings per site specifications	X			
Approve equipment layout drawings		X		
Assemble and rack equipment per site drawings	X			
Connect all intercabling of equipment and label	X			
Power-up equipment and conduct initial check-out	X			
Program equipment	X			
Optimize and verify proper operation	X			

TASK	TASK OWNER			COMMENTS
	MOT	Comm. of VA and/or Localities		
Verify proper communications end to end throughout the subsystem	X			
Conduct and pass factory acceptance test	X			
Breakdown and pack equipment	X			
Ship equipment to the Commonwealth	X			
INVENTORY AND STORAGE				
Provide interim equipment warehousing	X	X		
Inventory and transfer of title upon delivery	X	X		
FIXED NETWORK EQUIPMENT				
Dress and label all Contractor-provided cabling	X			
INSTALLATION AT DISPATCH CENTER CENTERS				
Install dispatch center console position and ancillary equipment (CRTs, computers)	X			
FIXED NETWORK EQUIPMENT OPTIMIZATION				
Fixed network equipment subsystem programming	X			
Re-verify all jumper and dip switch settings	X			
Re-verify all equipment passes self-diagnostics	X			
Verify all contract-supplied RF equipment for proper forward and reflect power	X			For donor radio installations
Verify all contract-supplied RF equipment for proper deviation settings	X			For donor radio installations
Verify proper operation of all contract equipment for basic functions and features as well as proper operation on intended locality system	X	X		For donor radio installations



TASK	TASK OWNER			COMMENTS
	MOT	Comm. of VA and/or Localities		
COMMUNICATION SUBSYSTEM INTEGRATION				
Interface dispatch center console equipment of equipment backbone	x			
Verify each dispatch center console position can access and pass audio properly	x			
Verify each dispatch center console position properly performs designated functions	x			
PREPARE CONTROL STATIONS				
Program control stations	x			
SUBSYSTEM ACCEPTANCE				
Develop acceptance test plans	x	X		
Approve acceptance test plans		X		
ACCEPTANCE TEST				
Installation workmanship quality	x	X		
Verify proper dispatch center control station operation on intended locality systems	x	X		
Verify proper operation of all offered functions and features	x	X		
PUNCHLIST RESOLUTION				
Document punch list	x	X		
Resolve punch list	x	x		
TRAINING				
Finalize and approve training plan and course outlines	x	X		
Identify Training Facilities		X		

TASK	TASK OWNER			COMMENTS
	MOT	Comm. of VA and/or Localities		
Prepare and duplicate course materials	X			
Schedule classes	X	X		
Conduct training	X			
SUBSYSTEM DOCUMENTATION				
Subsystem block and level drawings	X			
Dispatch Center console layout	X			
Equipment rack elevation drawings	X			
Wiring/cabling diagrams	X			
Subsystem level set documentation	X			
Equipment manuals	X			

3.1.23 MOTOBIDGE IP Interoperability Solution Training

In the process of assessing the Commonwealth of Virginia’s training needs, Motorola has identified the following course(s) that are necessary to achieve your training goals.

Course	Target Audience	No. of Sessions	Duration (days)	Location	Date	No. of Attendees
MOTOBIDGE IP Interoperable Solution Dispatch Console Operator	Trainers	2	1	Richmond, VA	TBD	Up to 15
Course Description: This course provides console users with an overview of the MOTOBIDGE IP Dispatch Application (DA) and its basic operation.						
MOTOBIDGE IP Interoperable Solution Administrator Control Panel (ACP)	Supervisors / Subsystem Administrators	1	½ (4 hours)	Richmond, VA	TBD	Up to 15
Course Description: This course provides participants with an overview of the MOTOBIDGE IP subsystem and the basic operation of the Administrator Control Panel (ACP).						
MOTOBIDGE IP Interoperable Solution Subsystem Administrator's Workshop	Subsystem Administrators	1	1	Richmond, VA	TBD	Up to 15
Course Description: This course is intended for Subsystem Administrators responsible for subsystem management on the MOTOBIDGE IP subsystem. This course covers the full functionality of the Administrator Control Panel (ACP).						
MOTOBIDGE IP Interoperable Solution Installation and Configuration	Technicians	1	2	Richmond, VA	TBD	Up to 15
Course Description: This course provides an advanced level of understanding on how to install, program, configure, maintain and troubleshoot the MOTOBIDGE IP Interoperable Solution subsystem. How to administer the MOTOBIDGE IP Interoperable Solution subsystem by using the Administration Control Panel (ACP) and the ConfigMaker. The course is designed to provide the technician with ample "Hands-On" lab exercises, and troubleshooting.						



NOC Operator Class

Motorola does not have a specific procedure that can be part of the MOTOBRIDGE IP training classes that will monitor the operation of the STARS IV&D Network and the STARS Microwave Network to determine the impact MOTOBRIDGE IP has in these networks (i.e. congestion and wait times). The STARS IV&D Network and STARS Microwave Networks will be monitored separately. Motorola and STARS will work together to set operational policies and procedures to address any negative system wide impact.



MOTOBRIDGE IP Dispatch Console Operator End User Training Course No. EUT014

Duration

8 hours

Target Audience

Train the Trainers for End Users

Course Description

This course provides console users with an overview of the MOTOBRIDGE IP Dispatch Application (DA) and its basic operation.

Recommended Prerequisites

None

Key Topics

- STARS Overview
- Introduction to MOTOBRIDGE IP subsystem.
- Overview of Dispatch Application.
- Create a radio talkpath.
- Create a dispatch talkpath.
- Create a radio-to-radio talkpath.
- Create a conference.
- Edit connection, color, and audio settings.

MOTOBIDGE IP Administrator Control Panel (ACP) End User Training Course No. EUT015

Duration

4 hours

Target Audience

Dispatch Supervisors, Subsystem Administrators, and Subsystem Managers

Course Description

This course provides participants with an overview of the MOTOBIDGE IP subsystem and the basic operation of the Administrator Control Panel (ACP). Users who will be responsible for configuring subsystem parameters, updating software releases, and maintaining gateway devices should register for MOT001, "MOTOBIDGE IP Subsystem Administrator's Workshop."

Recommended Prerequisites

None

Key Topics

- STARS Overview
- Introduction to MOTOBIDGE IP subsystem.
- Overview of ACP.
- Configuration of administrator's interface.
- Configuration of users.
- Monitoring connections
- Working with alarms and statuses.



MOTOBIDGE IP Subsystem Administrator's Workshop

Course No. MOT001

Duration

1 day

Target Audience

This course is intended for Subsystem Administrators responsible for subsystem management on the MOTOBIDGE IP subsystem. This course covers the full functionality of the Administrator Control Panel (ACP). Users who will not be responsible for configuring subsystem parameters, updating software releases, and maintaining gateway devices should register for EUT015, "MOTOBIDGE IP Administrator Control Panel (ACP) End User Training."

Course Description

This course provides an overview of how to use the Administrator Control Panel (ACP) software to manage the MOTOBIDGE IP subsystem.

Recommended Prerequisites

Experience with Windows applications is recommended.

Course Objectives

- Explain the purpose of the MOTOBIDGE IP subsystem.
- List and describe the different MOTOBIDGE IP subsystem features and capabilities.
- Perform the various MOTOBIDGE IP subsystem management functions using the Administrator Control Panel (ACP) software.

Course Outline

- I. Introduction/Orientation to Course and Classroom Materials
- II. STARS Overview
- II. MOTOBIDGE IP Subsystem Overview
 - A. Subsystem Overview
 - B. Administrator Control Panel (ACP) Overview
- III. Introduction to the Administrator Control Panel
 - A. Accessing the ACP Software
 - B. Working with the ACP Map
- IV. Configuring Subsystem Structure
 - A. Subsystem Tree
 - B. Configuring Regions, Counties, and Public Safety Answering Points (PSAP)
 - C. Configuring Agencies and Resource Groups
- V. Configuring Users



- A. User Overview
- B. Viewing Users
- C. Working with Users
- VI. Configuring Resources
 - A. Viewing GUs and Properties
 - B. Adding Gateway Units
 - C. Modifying and Removing Gateway Units
- VII. Performance Management
 - A. Performance Management
 - B. Audio Monitoring
- VIII. Fault Management
 - A. Status Window
 - B. Subsystem Status History
- IX. Managing Gateway Units (GU)
 - A. GU Connections
 - B. GU Software Releases
- X. Subsystem Parameters and Security
 - A. Subsystem Parameters
 - B. Update Subsystem Parameters
 - C. Activating Subsystem Parameters

MOTOBIDGE IP Installation and Configuration

Course No. MOT002

Target Audience

Experienced electronic technicians who are directly involved with the installation and maintenance of the Motorola MOTOBIDGE IP Interoperable Solution products.

Course Description

This course provides an advanced level of understanding on how to install, program, configure, maintain, and troubleshoot the MOTOBIDGE IP Interoperable Solution subsystem and how to administer the MOTOBIDGE IP Interoperable Solution subsystem by using the Administration Control Panel (ACP) and the ConfigMaker. The course is designed to provide the technician with ample “Hands-On” lab exercises, and troubleshooting.

Note: Course given as customer specific, will cover options pertinent to customer equipment

Duration: 2 Days

Recommended Prerequisites

An understanding of:

- Basic two-way FM communications radio theory
- Completed formal Electronics training
- Functional knowledge of Trunking and Networking concepts or extensive experience in Networking.
- Experience using common communications test equipment is also required.

Course Objectives

- Understand the operation of the MOTOBIDGE IP subsystem.
- Identify the major components and connections within MOTOBridge IP subsystem.
- Describe how calls are routed within the MOTOBridge IP subsystem.
- Participants will learn how to install, program, configure, test, maintain and troubleshoot the MOTOBridge IP to the FRU / FRE level
- Participants will learn how to Administer the MOTOBridge IP Subsystem with the Configuration Tool and the Administrator Control Panel (ACP).

Course Outline

- I. Introduction/Orientation to Course and Classroom Materials
- II. STARS Overview



- III. MOTOBIDGE IP Subsystem Overview
 - A. Subsystem Manuals
 - B. Interoperability Overview
 - C. Subsystem Overview
 - D. Subsystem Architecture & Components
 - E. Network Hardware
 - F. Operations & Management Center (OMC)
 - G. Session Initiation Protocol (SIP) Proxy Server
 - H. Administrator Control Panel (ACP)
 - I. Gateway Units (WSGU & RGU)
 - J. Dispatch Console PC
- IV. Operation & Management Center (OMC)
 - A. OMC Programming & Configuration
 - B. Installing OMC Software
 - C. Maintaining the OMC Server (UNIX Commands)
- V. Session Initiation Protocol (SIP) Proxy Server
 - A. SIP Programming & Configuration
- VI. Administrator Control Panel (ACP)
 - B. Configuring the Administrator Control Panel (ACP) Client PC
 - C. Administering your Subsystem with the Administrator Control Panel (ACP) Client PC
- VII. Radio and Workstation Gateway Units (RGU & WSGU)
 - A. Installation and Connection
 - B. Configuring the Technician PC with the Configuration Tool
 - C. Configuring the Gateway Units with the Configuration Tool
 - D. Monitoring Your Subsystem with the Configuration Tool
- VIII. Dispatch Work Station PC (WSPC)
 - D. Configuring the Dispatch Console PC
 - E. Using the Dispatch Application Software