MINNESOTA
PUBLIC SAFETY MOBILE RADIO CROSS SPECTRUM INTEROPERABILITY SYSTEM OPERATIONS PLAN

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Executive Summary

The Statewide Radio Board (SRB), operating as the State Interoperability Executive Committee (SIEC), develops guidelines and standards, as well as coordinates the use of interoperability frequencies in all frequency bands assigned to public safety users in Minnesota. The primary system for providing public safety radio interoperability in Minnesota is the Allied Radio Matrix for Emergency Response (ARMER). ARMER is a 700/800 MHz, trunked, Project 25 (P25) standards-based shared radio system offering the highest level of interoperability to state, local, and regional agencies that join ARMER. Aside from 700/800 MHz, public safety entities in Minnesota and adjacent states operate in the Very High Frequency (VHF) 150-174 MHz band. In recognition of this, the SRB approved a supplemental interoperability plan utilizing the ARMER backbone to support additional interoperability infrastructure in the VHF band.

The Minnesota Department of Transportation (MnDOT) is currently implementing a non-metro Motorola Radio over Internet Protocol (RoIP) network (Motobridge™) to connect an overlay of VHF interoperability radio equipment at 109 non-metro ARMER radio sites to support the SRB's interoperability plan. *This overlay will work seamlessly in conjunction within the existing Metro Region VHF system. While enhancing access to users outside of the Metro Region, it is not physically connected to the metro system and does not extend the current coverage experienced by metro users.* The Cross Spectrum Interoperability System, or Interop System, will provide a "lifeline" level of coverage to VHF users operating outside their normal operational areas, including areas that have migrated to ARMER. This system also provides other potential options for enhanced local or regional interoperable communications.

The Minnesota Department of Public Safety (DPS), division of Emergency Communication Networks (ECN), contracted the development of the operations and training plans needed to support use of the Interop System. The *Cross Spectrum Interoperability System Operations Plan* (Operations Plan) outlines the Interop System operational policies and procedures and defines how the various elements of the Interop System provide cross-spectrum interoperability for public safety agencies throughout Greater Minnesota. The Operations Plan incorporates significant input from public safety agencies gathered during meetings with the Cross Spectrum Interoperability System Steering Committee (Steering Committee), as well as stakeholder review and input on draft versions of the plan. Additionally, ECN reviewed similar systems and operational plans from other states and verified that the Operations Plan was consistent with federal rules and regulations concerning the use of national interoperability channels.

ARMER remains the primary interoperability system in Minnesota, and deployment of the Interop System only supplements or enhances that system's capabilities. ARMER provides the highest level of voice systems interoperability, Level 5, as defined by the Department of Homeland Security (DHS) in the Interoperability Continuum. The Interop System provides a hybrid level of interoperability, incorporating Level 2 components, gateways, as well as Level 3 components, shared (VHF) channels. Previous deployment of ARMER control stations to each non-metro Public Safety Answering Point (PSAP) in Minnesota further augments the interoperability capabilities provided by ARMER and the Interop System.

The Interop System is comprised of multiple elements, classified in the Operations Plan as follows:

VLAW31 Stations

MnDOT will deploy VHF base stations at 109 non-metro ARMER sites on the national VHF Interoperability channel, VLAW31. Primarily used for law enforcement communications, these stations are accessible via Motobridge™ dispatch positions at Minnesota State Patrol and ARMER consoles that have sufficient capacity to access the VLAW31 stations in their area. ARMER and non-ARMER dispatch centers may also purchase their own Motobridge™ dispatch positions and connect them to the Interop System resources, subject to technical and administrative requirements provided by MnDOT and the SRB. Motobridge™ dispatch positions may include locally deployed Motobridge™ Workstation Gateway Units (WSGU) or software only deployments of the Motobridge™ dispatch application. In either case, the Motobridge™ dispatch position must also have a secure connection to the private Motobridge™ IP network used by the Interop System.

Appendix B of this report provides VLAW31 site locations and console naming conventions, while Appendix C provides a condensed user guide for operations on VLAW31.

VHF Variable Frequency Stations

MnDOT will also deploy frequency selectable VHF base stations, or VFS units, at 109 non-metro ARMER sites, programmed with the national VCALL10 and VTAC91-94 channels, as well as VLAW31, VFIRE23, VMED28, and MNCOMM. These resources serve discipline-specific needs using the VLAW31, VFIRE23, VMED28, and MNCOMM channels or cross-discipline communications using the VCALL or VTAC channels. The "home", or default, hailing channel for these stations will be VCALL10 in most areas,

unless this channel is unauthorized due to cross-border coordination concerns with Canada. In those areas, MNCOMM will be the “home”, or default, hailing channel. Since these stations may operate on multiple channels, access to them requires a Motobridge™ dispatch position connected to the Interop System. Appendix D provides a list of the VFS sites and their respective naming conventions. Appendix E provides a condensed user guide for operations on the VFS channels, and Appendix F lists the appropriate hailing channel per VFS site.

Locality Specific Resources

Locality specific resources include interoperability equipment and patches deployed to meet communication needs in a specific area. Two examples of this type of resource are the deployment of 800 MHz national mutual aid channels in certain targeted areas and the provision for permanent hard patches of a non-ARMER county’s main VHF channel to a specific ARMER talkgroup.

The Interop System will include a limited deployment of base stations on the national 800 MHz calling channel (8CALL90) and another set of 800 MHz variable frequency stations, designated as 8TAC9X resources, capable of operating on one of the four national 800 MHz tactical channels (8TAC91-94) at a time. The 8CALL90 and 8TAC9X stations may be accessible on ARMER dispatch consoles and Motobridge™ dispatch positions. Appendix G provides a list of 800 MHz national mutual aid sites and their respective naming conventions. Appendix H provides an operations guide for the 800 MHz national mutual aid channels deployed in the Interop System.

Non-ARMER counties will primarily use a hard patch from their main VHF channel to a specific ARMER talkgroup for communications between county and state law enforcement agencies. Operations on these connections will also be subject to specific guidelines jointly developed by the participating entities, MnDOT, and the SRB; therefore, operations guides for these connections are not included in the Operations Plan. In the absence of specific local operational policies, existing ARMER standards stipulate use of standard language for these resources.

System-to-System Resources

These resources include interoperable connections between disparate systems via patched radio links or RoIP gateway-to-gateway connections. Operation plans and procedures for these types of connections will require coordination and agreements with entities in other areas outside the jurisdiction of the Minnesota SRB. Because each agreement and connection of this type will likely have different procedural and technical

configurations, operations guides for this type of resource are also not included in the current Operations Plan.

Dispatch Resources:

These Interop System's dispatch resources consist of ARMER consoles capable of accessing the VLAW31, 8CALL90, and 8TAC9X stations as well as Motobridge™ dispatch positions capable of accessing the VLAW31, VFS, 8CALL90, and 8TAC9X and VFS resources. Motobridge™ dispatch positions may include locally deployed Motobridge™ Workstation Gateway Units (WSGU) or software only deployments of the Motobridge™ dispatch application. In either case, the Motobridge™ dispatch position must also have a secure connection to the private Motobridge™ IP network used by the Interop System.

A high-level overview of the Interop System and its various components is provided in Figure 1.

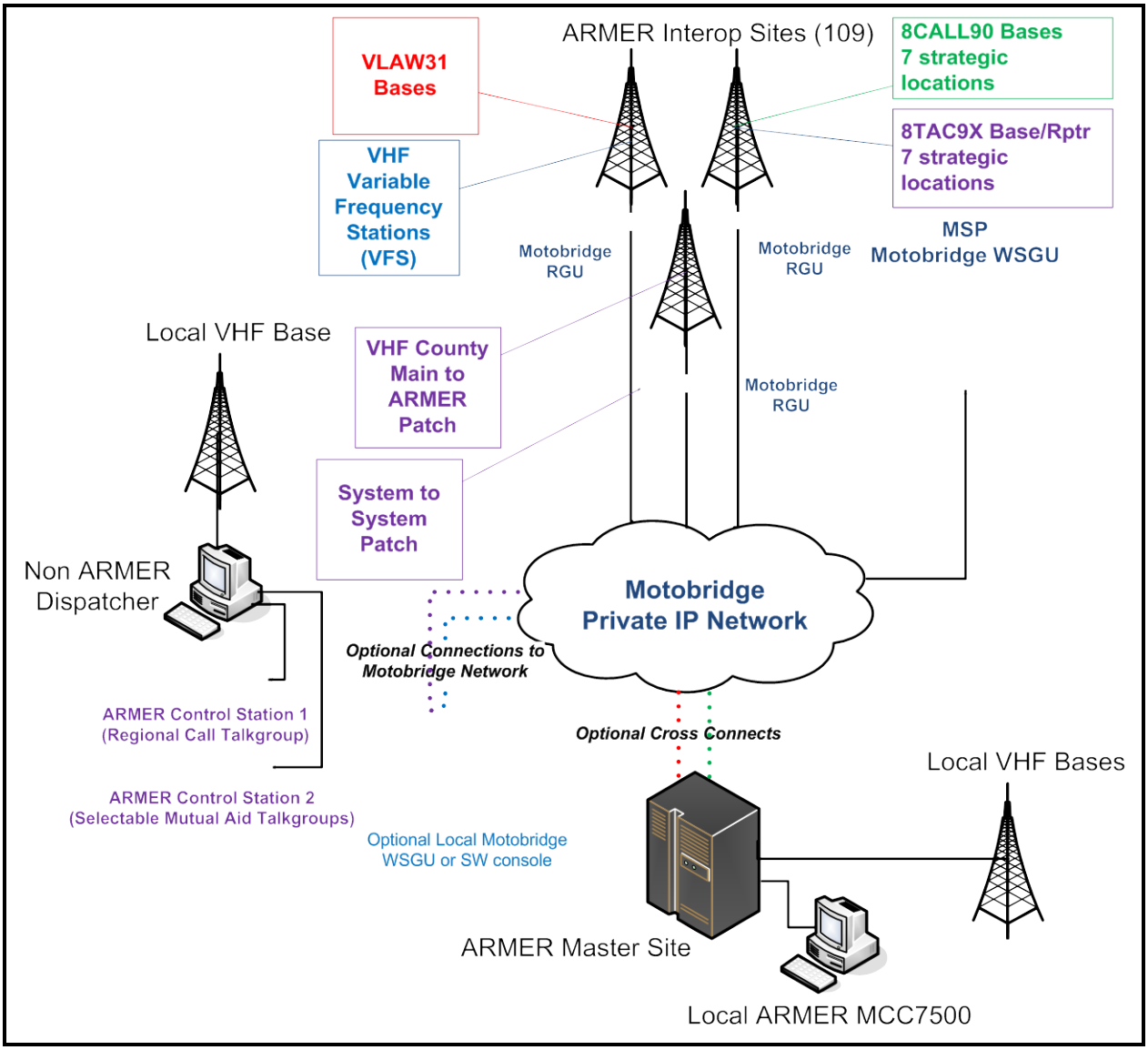

Figure 1 - Interop System Diagram

The Training Plan for the Interop System has been developed and includes learning objectives and a training program to support implementation of the Operations Plan. ECN has developed the training plan in collaboration with DPS, MnDOT, and the Steering Committee. Two train-the-trainer sessions were scheduled and completed at St Cloud and Mankato and 40 Trainers were trained. ECN has finalized all the training materials and once approved by the SRB will provide a final training plan and supporting documentation to the 40 Trainers.

Lastly, ECN is working with DPS and MnDOT to identify existing or new tools needed to support the ongoing operations and training needs of the Interop System. This includes developing a strategy for enabling Interop System users to identify which Interop Systems are deployed and available in each county, as well as revising existing ARMER standards to account for new conditions and capabilities presented by the deployment of the Interop System.

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1. Introduction

The primary system for providing public safety radio interoperability in Minnesota is the Allied Radio Matrix for Emergency Response (ARMER). ARMER is a 700/800 MHz, trunked, Project 25 (P25) standards-based shared radio system, available to all public safety users, offering the highest level of interoperability to state, local, and regional agencies that join the system. Aside from 700/800 MHz, public safety entities in the state primarily use Very High Frequency (VHF) frequencies in the 150-174 MHz band. In recognition of this, the original deployment plans for ARMER also envisioned an ancillary system that would leverage the investment in ARMER by utilizing the ARMER backbone to support additional interoperability infrastructure to provide cross spectrum interoperability between users that operate on ARMER and non-ARMER system users.

The Statewide Radio Board (SRB), operating as the State Interoperability Executive Committee (SIEC), is responsible for governance of the ARMER system, development of statewide standards and guidelines for interoperability, as well as coordinating the use of interoperability frequencies in all frequency bands assigned to public safety users in Minnesota. In January 2010, the SRB approved a modified interoperability plan to utilize the ARMER backbone to support additional interoperability infrastructure in the VHF band and deployment of a Radio over Internet Protocol (RoIP) network to provide the capability of connecting these and other interoperability resources to local, state, federal, and tribal users. Subsequent to the approval of this plan, the SRB also approved a VHF Interoperable Frequency Plan that identified and established guidance for the use of VHF interoperable frequencies in Minnesota.

Acting upon these plans, the Minnesota Department of Transportation (MnDOT) is implementing a Motorola Motobridge™ RoIP network with RoIP gateways that will ultimately provide access to an overlay of VHF interoperability radio equipment at 109 non-metro ARMER radio sites. The Cross Spectrum Interoperability System, or Interop System, will provide a “lifeline” level of coverage to VHF users operating outside their normal operational areas, including areas that have migrated to ARMER. This system also provides other options for interoperable connections on a local or regional basis, including connecting to systems used in other states.

Recognizing the operational complexity that these new capabilities represent to ARMER and non-ARMER users, the Minnesota Department of Public Safety (DPS), division of Emergency Communication Networks (ECN), contracted the development of the *Cross Spectrum Interoperability System Operations Plan*. This plan outlines the Interop System’s operational policies and procedures and defines how the various elements of

the Interop System will provide cross-spectrum interoperability for public safety agencies throughout the state.

2. Operations Plan Development

Development of the *Cross Spectrum Interoperability System Operations Plan* included multiple phases of discovery, research, and interaction with selected stakeholders.

Initially, ECN conducted a review of the approved Interop System Plan and supporting background information related to that plan. Next, ECN compared that data against additional engineering and support documentation supplied by MnDOT, including documents relating to MnDOT's system configuration and deployment plans for the Interop System.

ECN compared the data collected during this discovery process to data collected during interviews with system managers of similar statewide interoperability systems deployed in Kansas, Georgia, and Florida. ECN formally presented this information, along with the Interop System configuration and deployment plans, to the SRB Interoperability Committee and the Cross Spectrum Interoperability Steering Committee in December 2011.

After these meetings, ECN defined interoperability scenarios for possible utilization by the Interop System. DPS, MnDOT, and ECN worked cooperatively with several key stakeholders from the Law Enforcement, Fire, and Emergency Medical Services (EMS) disciplines to develop realistic scenarios for inclusion in the *Cross Spectrum Interoperability System Operations Plan.* In February 2012, ECN reviewed these operational scenarios with the Cross Spectrum Interoperability Steering Committee and updated Interop System configuration diagrams.

ECN developed and presented a draft version of the *Cross Spectrum Interoperability System Operations Plan* to the Cross Spectrum Interoperability Steering Committee in February 2012. Based on feedback from this meeting and the committee's review of the draft plan, ECN updated and presented a final version of the Cross Spectrum Interoperability System Operations Plan to the SRB Interoperability Committee on March 20, 2012.

3. Cross Spectrum Interoperability System Overview

The Cross Spectrum Interoperability System, or Interop System, comprises multiple network and radio system components. The core portion of the system is a private Internet Protocol (IP) based network, managed and maintained by MnDOT, which shares transport system infrastructure with the ARMER 800 MHz radio network. Maintaining this transport system as a closed, private IP network enhances the security, stability, and maintainability of the network. MnDOT utilizes Motorola Motobridge™ system software and hardware to connect disparate radio and dispatch resources and to manage these resources effectively. Other ancillary system hardware, including audio bridges, provides the capability to connect certain Interop System radio resources to radio dispatch consoles on the ARMER system.

ARMER remains the primary interoperability system in Minnesota, and deployment of the Interop System only supplements or enhances that system's capabilities. As a shared, standards-based system, ARMER provides the highest level of interoperability, Level 5, as defined by the Department of Homeland Security (DHS) in the *Interoperability Continuum*[1]. The Interop System provides a hybrid level of interoperability incorporating both Level 2 components, gateways, as well as Level 3 components, shared (VHF) channels. The complete list of the levels of voice interoperability in the technology lane as defined by DHS is as follows:

- Level 1 - Swap radios
- Level 2 - Gateways
- Level 3 - Shared channels
- Level 4 - Proprietary shared systems
- Level 5 - Standards-based shared systems

ARMER Standard 3.24.0, *Public Safety Answering Point (PSAP) Interoperability*, mandated the provision of two ARMER radio control stations to each non-metro PSAP, in order to establish a uniform capability to communicate with PSAPs in areas that migrate to ARMER and those that do not. The state used Public Safety Interoperable Communications (PSIC) grants and matching funds to purchase and provide these ARMER control stations. One ARMER radio control station monitors regionally designated hailing talkgroups, while the second ARMER radio control station enables patching of local communication resources. The deployment of the ARMER control

[1] http://www.safecomprogram.gov/SiteCollectionDocuments/Interoperability_Continuum_Brochure_2.pdf

stations provides additional interoperability resources for possible use in conjunction with the Interop System resources. Table 1 provides the regional hailing talkgroup for each ARMER region.

Table 1 – ARMER Regional Hailing Talkgroups

ARMER Region	Regional Hailing Talkgroup
Metro	MSP CALL[2]
Northeast	NE CALL
Northwest	NW CALL
Central	CM CALL
South Central	SR CALL
Southwest	SW CALL
Southeast	SE CALL

The following are Interop System resources and their classifications:

- **VLAW31 Stations**: VHF base stations deployed at 109 non-metro ARMER sites on the national VHF Interoperability channel, VLAW31.
- **VHF Variable Frequency Stations**: Frequency selectable VHF stations deployed at 109 non-metro ARMER sites, programmed with the national VCALL and VTAC channels as well as VLAW31, VFIRE23, VMED28 and MNCOMM.
- **Locality Specific Resources**: Includes interoperability equipment and patches deployed to meet communication needs in a specific area.
- **System-to-System Resources**: Includes interoperable connections between disparate systems via patched radio links or RoIP gateway-to-gateway connections.
- **Dispatch Resources**: Includes locally deployed Motobridge™ Workstation Gateway Unit (WSGU) or software only deployments of the Motobridge™ dispatch application.

The following sections describe each of these five separate sets of resources in more detail. Figure 2 provides a high-level depiction of the various Interop System resources.

[2] MSP CALL goes to Minnesota State Patrol

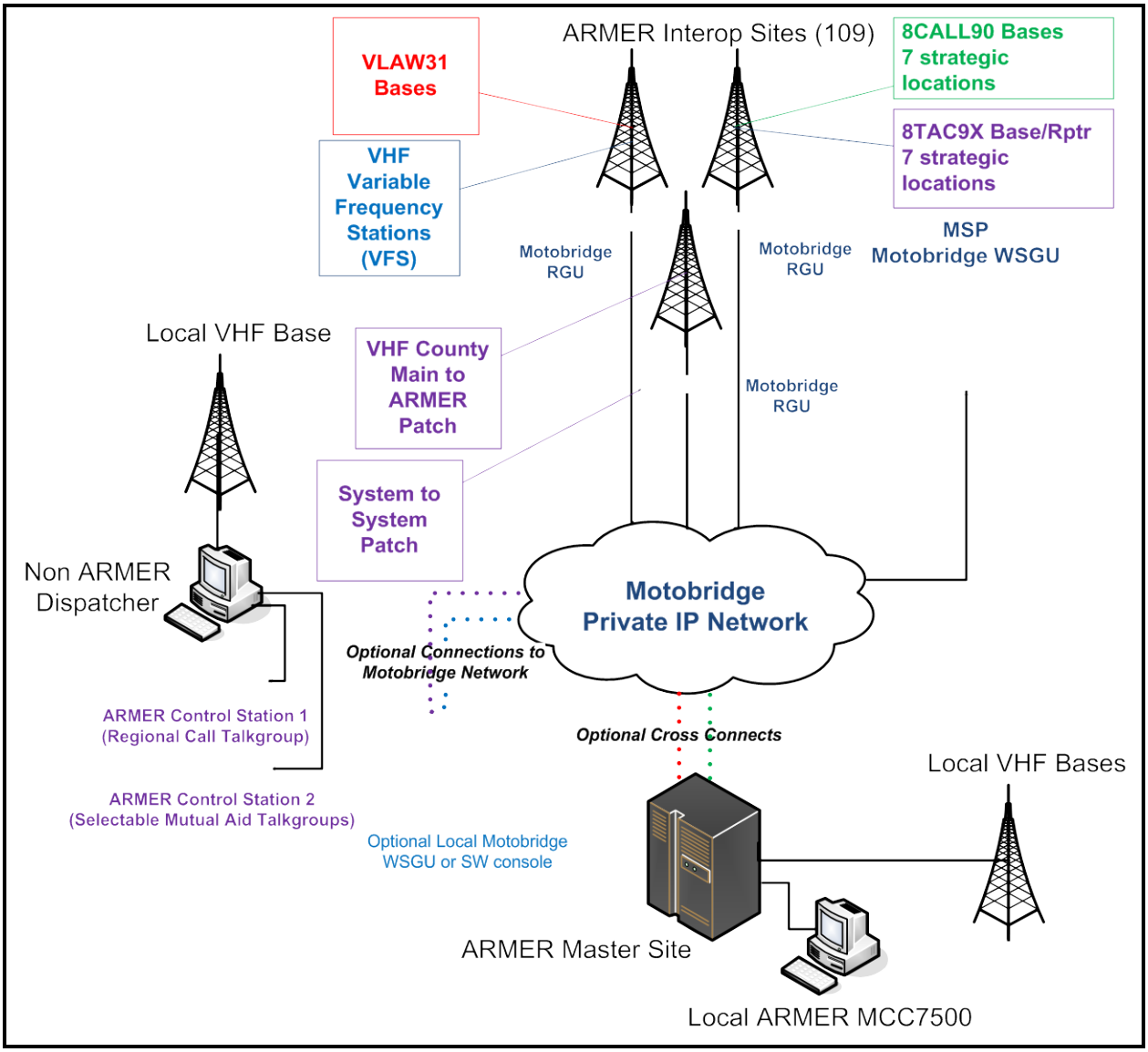

Figure 2 – Interop System Diagram

4. VLAW31 Stations

The primary radio resources in the Interop System are VLAW31 (155.475) base stations deployed at 109 non-metro ARMER sites, as shown in Appendix B, *VLAW31 Sites and Naming Conventions*. VLAW31 is the nationally recognized, standard name for the channel previously referred to as the Minnesota State Emergency Frequency (MINSEF). Prior to the Federal Communications Commission (FCC) deadline of January 2013, in order for users to transition to narrowband operations, VLAW31 will operate in a wideband analog mode. After that deadline, VLAW31 will only operate in narrowband analog mode. Under FCC rules, as noted in the *Minnesota VHF Interoperable Frequency Plan*, VLAW31 "is available nationwide for use in police emergency communications networks operated under statewide law enforcement emergency communications plans." The *Minnesota VHF Interoperable Frequency Plan* goes on to state:

> *"…the use of this channel is widespread in Minnesota and has been authorized for utilization by local, regional, and state authorities for fixed, mobile, and portable radios. Permission for use of this channel outside the law enforcement discipline, from the SRB and previous authorities, has been granted where an agency or entity has presented a compelling need to communicate directly with law enforcement officials or other SRB approved cases."*

As the primary link into the Interop System, the VLAW31 stations provide a "lifeline level" of mobile radio coverage, as noted in the previously approved and amended interoperability plan. The VLAW31 base stations deployed in the Interop System will primarily serve law enforcement agency (LEA) interoperability needs, because LEA mutual aid incidents often require rapid and efficient response to events that swiftly cross over jurisdictional and technological boundaries. Figure 3 is a high-level depiction of the Interop System VLAW31 resources and potential connections to those resources.

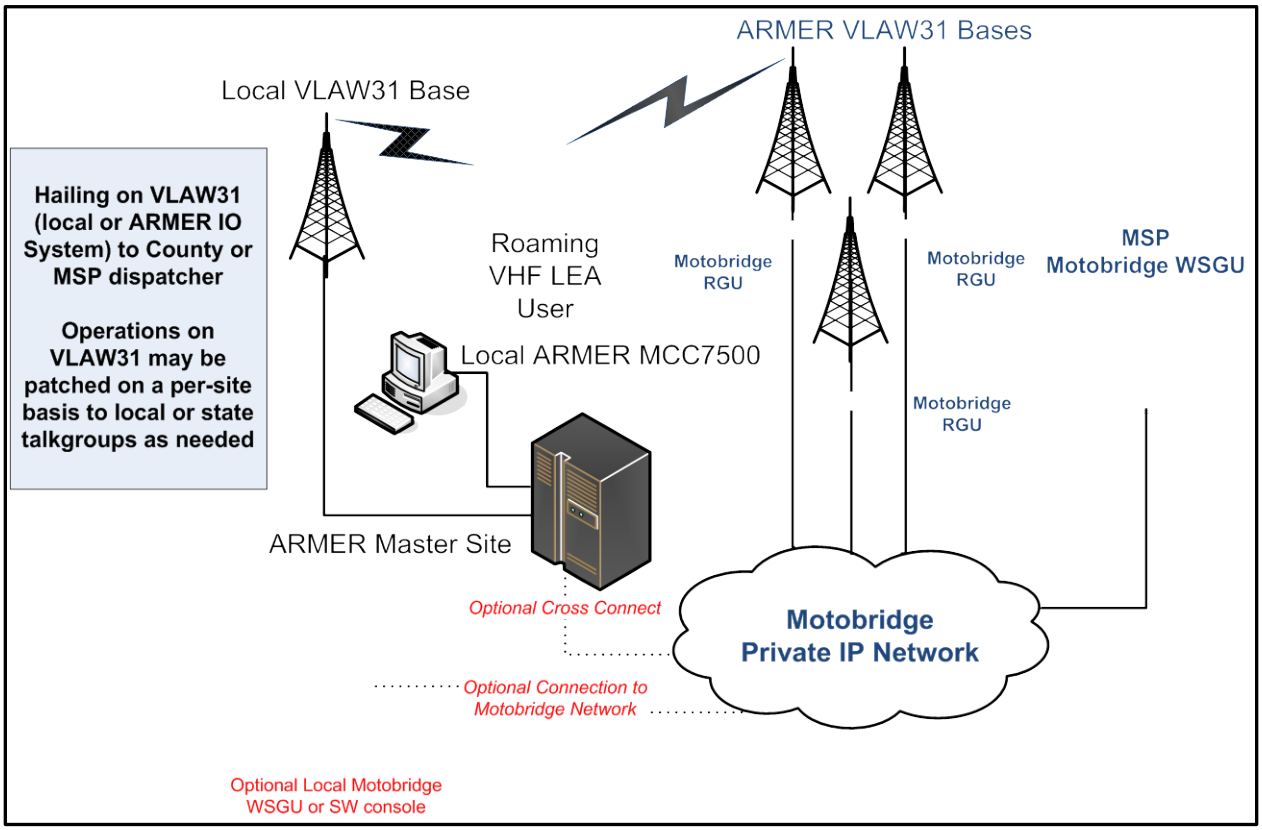

Figure 3 – Interop System VLAW 31 Stations

Minnesota State Patrol (MSP) will utilize ARMER and Motobridge™ dispatch positions to monitor and manage VLAW31 base stations deployed in the Interop System and will respond to appropriate requests for assistance from VHF radio users on the VLAW31 channel.

MnDOT will also implement ancillary equipment, including audio bridging devices, site routers, and conventional channel gateways, in order to enable optional cross connects from ARMER dispatch centers without Motobridge™ dispatch positions to the ARMER VLAW31 stations in their area. ARMER dispatch centers with MCC75000 or CENTRACOM Gold Elite consoles need sufficient capacity for the Interop System VLAW31 resources in their area prior to requesting to add these resources to their ARMER consoles. Connections to Interop System VLAW31 resources may replace or augment existing, locally maintained VLAW31 base stations. ARMER dispatch centers in adjacent counties may want to access Interop System VLAW31 resources across shared borders but this is only possible where those counties are in the same ARMER system zone or region. Specialized links across zone or region boundaries may be possible in order to provide adjacent ARMER dispatch centers with this capability;

however, this will require consultation with MnDOT technical staff on a case-by-case basis.

Both ARMER and non-ARMER dispatch centers may deploy their own Motobridge™ systems and connect them to the Interop System, subject to the technical and operational standards developed by MnDOT, DPS, and the SRB for such connections. If connected, these dispatch centers could also access the Interop System VLAW31 resources appropriate for their areas of operation but would be required to monitor these stations and respond to appropriate requests for assistance as needed.

4.1 VLAW31 Operations

The Interop System VLAW 31 resources or locally owned and operated VLAW31 stations primarily provide interoperability between a VHF LEA user moving into a county operating on ARMER or to request assistance from MSP. In either case, the VHF LEA user would hail the appropriate dispatch center, the local county or MSP, and that dispatch center would then determine the appropriate link for ongoing communications based on current ARMER protocols and standards.

If the VHF LEA user contacts a local county dispatch center, the local dispatcher may patch a VLAW31 resource to an appropriate ARMER system talkgroup in one of two ways:

- The local county dispatcher may patch the local (county owned) VLAW31 resource to an ARMER talkgroup as per applicable ARMER protocols and standards.
- The local county dispatcher with access to the Interop System VLAW31 resources in their area may patch one of these resources to an ARMER talkgroup as per applicable ARMER protocols and standards.

If the VHF LEA user contacts a MSP dispatch center, the MSP dispatcher may also patch the appropriate Interop System VLAW31 resource to an ARMER talkgroup as per applicable ARMER protocols and standards.

Multiple ARMER standards detail guidelines for the use of VLAW31 by local and state agencies and include:

- Standard 1.1.2, Criteria for the Installation of Base Stations and General Operations on MINSEF

- Standard 3.1.0, Use of Regional 800 MHz to MINSEF Interoperability
- Standard 3.5.0, National/Statewide VHF Interoperability Resources (VLAW31, VMED28, VFIR23, MIMS)
- Standard 3.9.0, Nationwide VHF and Interoperability Channels
- Standard 3.31.0, ARMER System StatusBoard Application Talkgroup or Channel Minimum Requirements
- Standard 3.32.0, Statewide Interoperable Plain Language Policy

Based on these ARMER standards, as well as procedures outlined in the National Incident Management System (NIMS) and Incident Management System (IMS), all users on the VLAW31 channel shall utilize certain operational policies and conventions.

1. Users shall use plain language at all times.
2. Users should initially identify themselves in the following manner: agency name, followed by service branch or function designation, followed by call sign or unit number, such as; "North EMS 512", "Elk River Police 512", "Stearns County Public Works 512", "State Patrol 512".
3. Users hailing a dispatch center outside their normal operational area should also identify the dispatch center or agency they are attempting to communicate with, such as; “State Patrol”, “Lake County SO”, “Elk River PD”. The order of identifications, initiator and hailed party, may vary since law enforcement, fire and EMS agencies typically use different conventions.
4. Users should also indicate the resource they are hailing on, such as “VLAW31”.
5. Dispatchers may patch only one VLAW31 resource in an area to one ARMER talkgroup per incident.
6. All participating entities shall use the ARMER System StatusBoard Application to track the use and patching of VLAW31 and ARMER talkgroup resources to maximize the visibility of the use of these resources for anything other than short-term incidents, such as a rapidly moving chase.
7. The setup and break down of patches are the responsibility of the dispatch center controlling the incident or event. Dispatchers should break down patches between VLAW31 and ARMER talkgroups or radio resources as soon as practical after the incident ends or migrates to another jurisdiction.

Appendix C provides a condensed user guide to operations on VLAW31.

5. VHF Variable Frequency Stations

The next level of resources provided in the Interop System is the VHF Variable Frequency Stations (VFS), also deployed at 109 non-metro ARMER sites. Table 2 shows the national VCALL and VTAC channels as well as VLAW31, VFIRE23, VMED28, and MNCOMM programmed into these frequency-selectable VHF stations. With some exceptions, as noted later in this section, each of these frequencies is individually selectable from each VFS station. A cross reference of the national standard naming convention and legacy conventions previously used in Minnesota is included in Appendix I, *VHF Interoperability Channel Cross Reference*.

Table 2 – VFS Frequencies[3]

Standard Name	Base Transmit Frequency	Base CTCSS (TX and RX)	Base Receive Frequency
VCALL10	155.7525	156.7	155.7525
VTAC11	151.1375	156.7	151.1375
VTAC12	154.4525	156.7	154.4525
VTAC13	158.7375	156.7	158.7375
VTAC14	159.4725	156.7	159.4725
MNCOMM	155.3700	156.7	155.3700
VFIRE23	154.2950	156.7	154.2950
VLAW31	155.4750	156.7	155.4750
VMED28	155.3400	156.7	155.3400

Since the VFS support multiple channels, these stations can only be fully utilized by dispatch centers that also have a Motobridge™ dispatch position and a secure connection to the private Motobridge™ IP network used by the Interop System. Figure 4 provides an overview of potential connections to the Interop System VFS resources.

[3] Frequency information in this table for base stations only. For mobile stations, please see Appendix I.

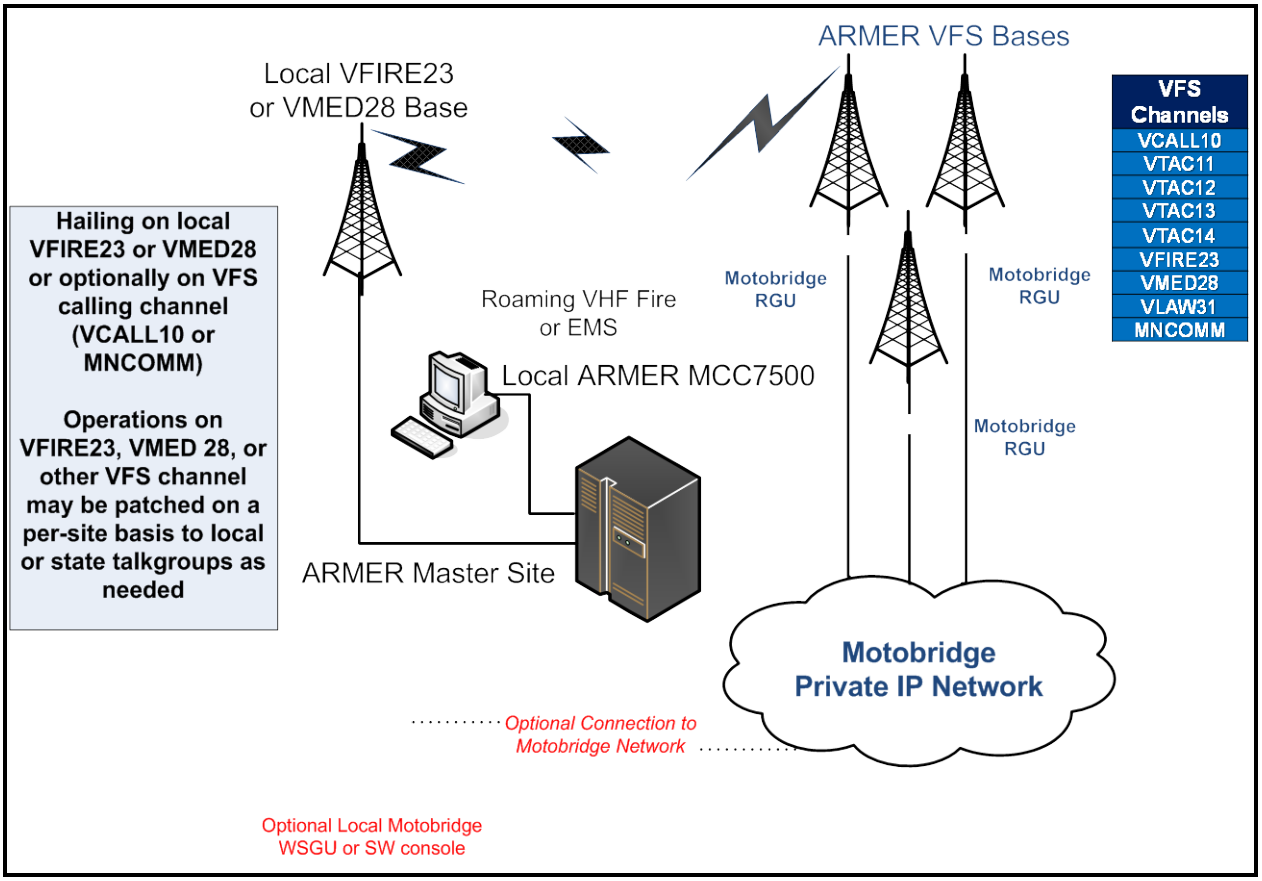

Figure 4 – ARMER VFS Stations

VCALL10 is a dedicated, national calling channel, while the VTAC channels are reserved for non-discipline specific interagency communications during an incident. The standard mode of operation for the VCALL and VTAC channels is analog narrowband. All fixed, mobile, and portable radios should transmit using the 156.7 Hz Continuous Tone-Coded Squelch System (CTCSS) code. All mobile and portable radios should be set for carrier squelch, unless CTCSS is necessary to mitigate interference.

MNCOMM will be the new standard name for the channel commonly referred to as the Minnesota Incident Management System (MIMS). MNCOMM will be the state's standard name for this channel when it is narrowbanded. The state uses this channel as an incident management channel and for point-to-point communications between public safety dispatch centers. The deployment of ARMER control stations to all public safety answering points has supplanted the traditional uses of MNCOMM, and the *VHF Interoperable Frequency Plan* identifies this channel as a secondary calling channel. MNCOMM operation is widespread in Minnesota and authorized for utilization by local,

regional, tribal, and state authorities for fixed, mobile, and portable radios. The current standard operational mode for this channel is wideband analog (25 kHz), but this channel is subject to the FCC mandated narrowbanding (12.5 kHz) deadline of January 1, 2013, and will transition to narrowband analog operation prior to the deadline.

The *VHF Interoperable Frequency Plan* identified VCALL10 as a statewide calling channel, due to limited existing use and licensing in Minnesota. This application is consistent with the FCC designation of that channel as a nationwide calling channel. However, due to frequency coordination restrictions with Canada, VCALL10 is not licensable for fixed base station use in certain areas along the Canadian border. For this reason, MNCOMM is the secondary calling channel in those locations.

In the areas permitted to use VCALL10 operation, the “home” mode for the VFS station would be VCALL10. In other words, the VFS station must always return to VCALL10 upon selection of another operational channel for a particular operation or incident. In areas not permitted to use fixed base operation of VCALL10, the “home” mode for the VFS station would be MNCOMM. Appendix D provides a list of VFS sites and Appendix F lists the appropriate calling channel for each site.

VFIRE23 is the primary channel for interagency fire communications in the state and commonly referred to in Minnesota as SWFIREMA. The *Minnesota Fire Frequency Utilization Plan was* developed in 1982, and FCC rulings resulted in the development of this frequency as a statewide mutual aid channel reserved for assignment to stations in the fire service. Use of this channel is widespread in Minnesota and authorized for use by local, regional, tribal, and state authorities for fixed, mobile, and portable radios. The SRB and previous authorities granted permission to utilize this channel outside the fire discipline, where an agency or entity presents a compelling need to communicate directly with fire officials, primarily Minnesota Department of Natural Resources (MN DNR) and EMS agencies, or other specific instances as approved by the SRB. The current standard operational mode for this channel is wideband analog, but the FCC narrowbanding mandate requires a migration of this channel to narrowband analog operation prior to January 2013.

VMED28 is the primary channel for interagency EMS communications in the state and is commonly referred to as EMS HEAR. Under FCC rules, “this frequency may be designated by common consent as an intersystem mutual assistance frequency under an area-wide medical communications plan” and was developed as a statewide mutual aid channel under the Minnesota EMS Radio Communications Plan published in 2007. The *Minnesota Hospitals Communications Best Practice Guide*, approved by the SRB in June 2011, provides further guidance for the use of this channel. Use of this channel is

widespread in Minnesota and is authorized for use by local, regional, and state authorities for fixed, mobile, and portable radios. The SRB and previous authorities limited permission to utilize this channel outside the EMS discipline or for hospitals. The current standard operational mode for this channel is wideband analog but must migrate to narrowband analog prior to January 2013, in accordance with the FCC mandated narrowbanding deadline.

5.1 VFS Operations

The Interop System VFS resources or locally owned and operated stations on VFIRE23 and VMED28 primarily provide interoperability between a VHF fire or EMS user moving into a county operating on ARMER. In either case, the VHF fire or EMS user would hail the appropriate dispatch center, and that dispatch center would then determine the appropriate link for ongoing communications based on current ARMER protocols and standards. Initial hailing should occur on the designated hailing channel for that area, either VCALL10 or MNCOMM, as designated in Appendix F.

Fire and EMS incidents requiring mutual aid typically evolve over time in a specific location or area and tend to be tactical in nature, with multiple agencies utilizing the same radio channel while on scene. Many EMS agencies also continue to utilize local VMED28 stations for dispatching and daily communications between medical transports and dispatching entities or hospitals. Local dispatchers may direct mutual aid responders to incident operational channels prior to or while responding or the responders may receive directions upon arrival at the incident command post. Agencies that migrate to ARMER often maintain some level of VHF communications capability by retaining VHF subscriber radios in certain apparatus and continuing to maintain some VHF infrastructure.

A local dispatcher using a Motobridge™ dispatch position connected to the Interop System VFS resources in their area may also select one of the national VHF interoperability channels, VTAC11-VTAC14, for specific interagency communications as part of an incident communications plan.

When a VHF fire or EMS user contacts a local county dispatch center, the local dispatcher may patch a VHF interoperability channel to an appropriate ARMER system talkgroup in one of two ways:

1. A local county dispatcher may patch the local (county owned) VFIRE23 or VMED28 resource to an ARMER talkgroup according to applicable ARMER protocols and standards.

2. A local county dispatcher with access to the Interop System VFS resources in their area may select the desired operational frequency on the VFS and patch one of these resources to an ARMER talkgroup according to applicable ARMER protocols and standards.

The following ARMER standards provide guidelines for the use of VFIRE23 and VMED28 by local and state agencies:

- Standard 3.5.0, National/Statewide VHF Interoperability Resources (VLAW31, VMED28, VFIR23, MIMS)
- Standard 3.9.0, Nationwide VHF and Interoperability Channels
- Standard 3.31.0, ARMER System StatusBoard Application Talkgroup or Channel Minimum Requirements
- Standard 3.32.0, Statewide Interoperable Plain Language Policy

Based on these ARMER standards as well as procedures outlined in the National Incident Management System (NIMS) and Incident Management System (IMS), all users on the VLAW31 channel shall utilize certain operational policies and conventions:

1. Users shall use plain language at all times.
2. Users should initially identify themselves in the following manner: agency name, followed by service branch or function designation, followed by call sign or unit number, such as "North EMS 512", "Elk River Police 512", "Stearns County Public Works 512", "State Patrol 512".
3. Users hailing a dispatch center outside their normal operational area should also identify the dispatch center or agency they are attempting to communicate with, such as “State Patrol”, “Lake County SO”, “Elk River PD”.
4. Users should also indicate the resource they are hailing on, such as “VCALL10”, “MNCOMM”, “VMED28”, or “VFIRE23”.
5. Dispatchers may patch only one VFS channel or local VFIRE23 or VMED28 station in an area to one ARMER talkgroup per incident, regardless of whether the use of a channel on the VFS or a local VFIRE23 and VMED28 channel is for interoperable communications.
6. All participating entities shall use the ARMER System StatusBoard Application to track the use of VFS channels, local VFIRE23 or VEMD28 channels, and

ARMER talkgroup resources to maximize the visibility of the use of such resources.

7. The setup and break down of patches are the responsibility of the dispatch center controlling the incident or event. Dispatchers should break down patches between VFS or local resources and ARMER talkgroups as soon as practical after the incident ends or migrates to another jurisdiction.
8. The dispatcher should always return the VFS resource to the designated home channel, either VCALL10 or MNCOMM, when breaking down a patch.

Appendix E provides a condensed user guide to operations for the VFS stations.

6. Locality Specific Resources

The use of a RoIP network as part of the Interop System allows additional flexibility in addressing locality specific interoperability needs. Two examples of this flexibility are the deployment of 800 MHz national mutual aid channels in certain targeted areas and the provision for direct patches of a non-ARMER county's main VHF channel to a specific ARMER talkgroup.

6.1 800 MHz National Mutual Aid Stations

The Interop System includes a limited deployment of stations on the national 800 MHz calling channel (8CALL90) and another set of variable frequency stations, designated as 8TAC9X resources, capable of operating on one of the four national 800 MHz tactical channels (8TAC91-94) at a time. These stations will be available at seven strategic non-metro locations in the state to provide direct interoperability on the national 800 MHz interoperability calling and tactical channels. Table 3 indicates the seven locations where these resources are available along with their corresponding ARMER region and zone.

Table 3 – 8CALL90 and 8TAC9X Station Locations

ARMER SITE	ARMER REGION	ARMER ZONE
Enfield	CM	4
Moorhead	NW	6
Mankato	SC	3
St Cloud	CM	4
Red Wing	SE	3
Duluth	NE	5
Wilson	SE	3

The 8CALL90 and 8TAC9X stations can be connected to ARMER dispatch consoles, similar to the Interop System VLAW31 resources, if the local dispatch consoles have sufficient capacity available to incorporate them. Figure 5 provides an overview of potential connections to the Interop System 8CALL90 and 8TAC9X stations.

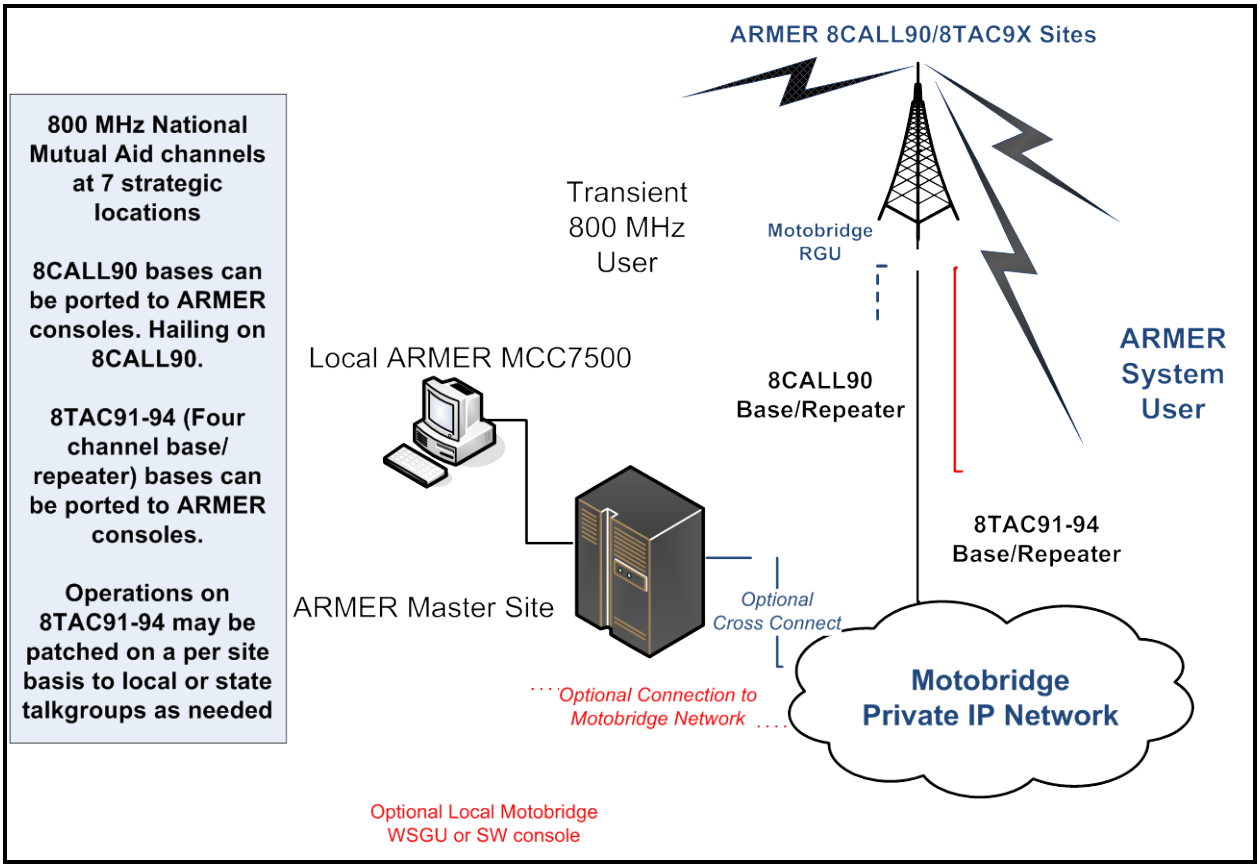

Figure 5 – 8CALL90 and 8TAC9X Stations

6.2 800 MHz National Mutual Aid Operations

The Interop System 800 MHz national mutual aid stations primarily provide interoperability between an 800 MHz radio system user that cannot access ARMER trunked system resources or to move 800 MHz radio users onto a separate radio channel for a specific incident. An example for the former case would include an 800 MHz radio user from out of state who does not have ARMER talkgroups programmed in their radio. In the latter case, an incident requiring long-term, interdisciplinary communications or direct (unit-to-unit) communications may be better served by operating on one of the national 800 MHz tactical channels. In either case, the 800 MHz user would hail the appropriate dispatch center, and that dispatch center would then determine the appropriate link for ongoing communications based on current ARMER protocols, standards, and local conditions. Initial hailing should occur on 8CALL90.

A local dispatcher with either an ARMER system console or a Motobridge™ dispatch position and access to the 8TAC9X station may also select one of the national 800 MHz

tactical channels, 8TAC91-8TAC94, for use during an incident or operation. Dispatchers can select these channels on an 8TAC9X station and use them for specific, interagency communications as part of an incident communications plan. The local dispatcher may patch one of these channels to an ARMER talkgroup according to applicable ARMER protocols and standards.

The following ARMER standards provide guidelines for the use of the 800 MHz national mutual aid channels by local and state agencies:

- Standard 3.31.0, ARMER System StatusBoard Application Talkgroup or Channel Minimum Requirements
- Standard 3.32.0, Statewide Interoperable Plain Language Policy

Based on these ARMER standards, the Region 22 Plan for use of 800 MHz public safety channels, as well as procedures outlined in the National Incident Management System (NIMS) and Incident Management System (IMS), all users on the 800 MHz national interoperability channels shall utilize certain operational policies and conventions.

1. Users shall use plain language at all times.
2. Users should initially identify themselves in the following manner: agency name, followed by service branch or function designation, followed by call sign or unit number; such as "North EMS 512", "Elk River Police 512", "Stearns County Public Works 512", "State Patrol 512".
3. Users hailing a dispatch center outside their normal operational area should also identify the dispatch center or agency they are attempting to communicate with, such as “State Patrol”, “Lake County SO”, “Elk River PD”.
4. Users should also indicate the resource they are hailing on, such as “8CALL90”.
5. A dispatcher may patch only one 8TAC9X channel in an area to one ARMER talkgroup per incident.
6. All participating entities shall use the ARMER System StatusBoard Application to track the use of 8TAC9X channels ARMER talkgroup resources to maximize the visibility of the use of such resources.
7. The setup and break down of patches are the responsibility of the dispatch center controlling the incident or event. Dispatchers should break down patches

between 8TAC9X and ARMER talkgroups as soon as practical after the incident ends or migrates to another jurisdiction.

Appendix G provides a list of 800 MHz national mutual aid sites in the state and their respective naming conventions. Appendix H provides an operations guide for the 800 MHz national mutual aid channels deployed in the Interop System.

6.3 County Main to ARMER Patch

Counties that do not migrate to ARMER may elect to have MnDOT deploy a hard patch from their primary VHF county radio system through the Interop System to an ARMER talkgroup designated for that particular county. This can be accomplished by a direct connection from the primary VHF county base or repeater or via a radio control station on the primary VHF county radio channel that is cross connected through the Interop System to an ARMER control station at an ARMER site in that county. ARMER users working in that county can contact the local dispatcher and monitor local VHF traffic, if desired, through this link to the designated ARMER talkgroup. The primary purpose for this link would typically be to provide direct communications between local LEA and MSP. MnDOT technical staff will configure and maintain this type of patch.

Figure 6 depicts the potential connections of this type that are available, assuming the local county, MnDOT, DPS, and the SRB concur with the arrangement.

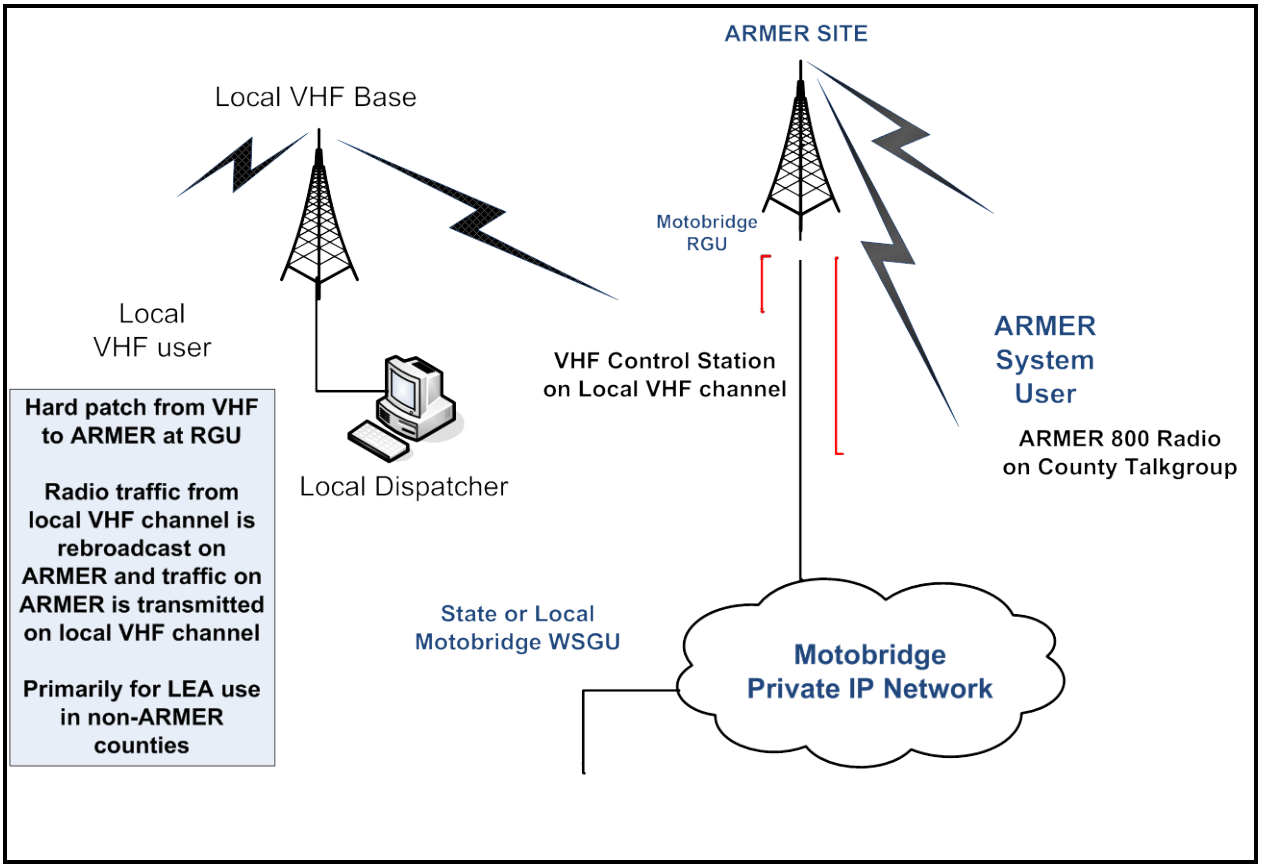

Figure 6 – County Main to ARMER Patch

6.4 County Main to ARMER Patch Operations

As noted earlier, the primary purpose for this type of connection would typically be to provide direct communications between local LEA and MSP. As this is a connection between MSP and the local entity, individual operational guidelines and procedures for each link may vary slightly to allow for effective use of the connection. Absent such conditions, the following ARMER standard provides guidelines for the use of the local resources when patched to ARMER system talkgroups:

- Standard 3.32.0, Statewide Interoperable Plain Language Policy

Based on these ARMER standards, as well as procedures outlined in the National Incident Management System (NIMS) and Incident Management System (IMS), all users operating on a local system to ARMER talkgroup patch shall utilize certain operational policies and conventions:

1. Users shall use plain language at all times.
2. Non-local radio users should initially identify themselves in the following manner: agency name, followed by service branch or function designation, followed by call sign or unit number, such as "North EMS 512", "Elk River Police 512", "Stearns County Public Works 512", "State Patrol 512".
3. Users hailing a dispatch center outside their normal operational area should also identify the dispatch center or agency they are attempting to communicate with, such as “State Patrol”, “Lake County SO”, “Elk River PD”.

7. System-to-System Resources

Another potential use of the Interop System is to establish selectable links between selected dispatch centers or systems. For instance, one or more ports on a Motobridge™ radio gateway unit (RGU) at an Interop System site could simply provide an audio link to another county or state dispatch center. Participating authorized agencies could patch this port to a radio resource in the other county or state's dispatch center, as well as to a resource on ARMER or the Interop System as needed. This provides more control of the patch on both sides and avoids tying up a patch with infrequently needed resources. Another option would be to patch two "donor" radios together, one on each system, in the Interop System. The donor radio for each system would have to be within the coverage area of their respective systems. Users on each system would only be able to communicate with the adjacent system users while they were each within their own coverage areas.

A similar link is possible between two RoIP style devices on a port-to-port basis or even on a system-to-system basis if both RoIP systems are capable of using the Bridging Systems Interface (BSI) standard connection. The Motobridge™ system release under implementation by Minnesota includes the BSI feature.

Figure 7 is a depiction of the potential connections of this type that are possible in the Interop System.

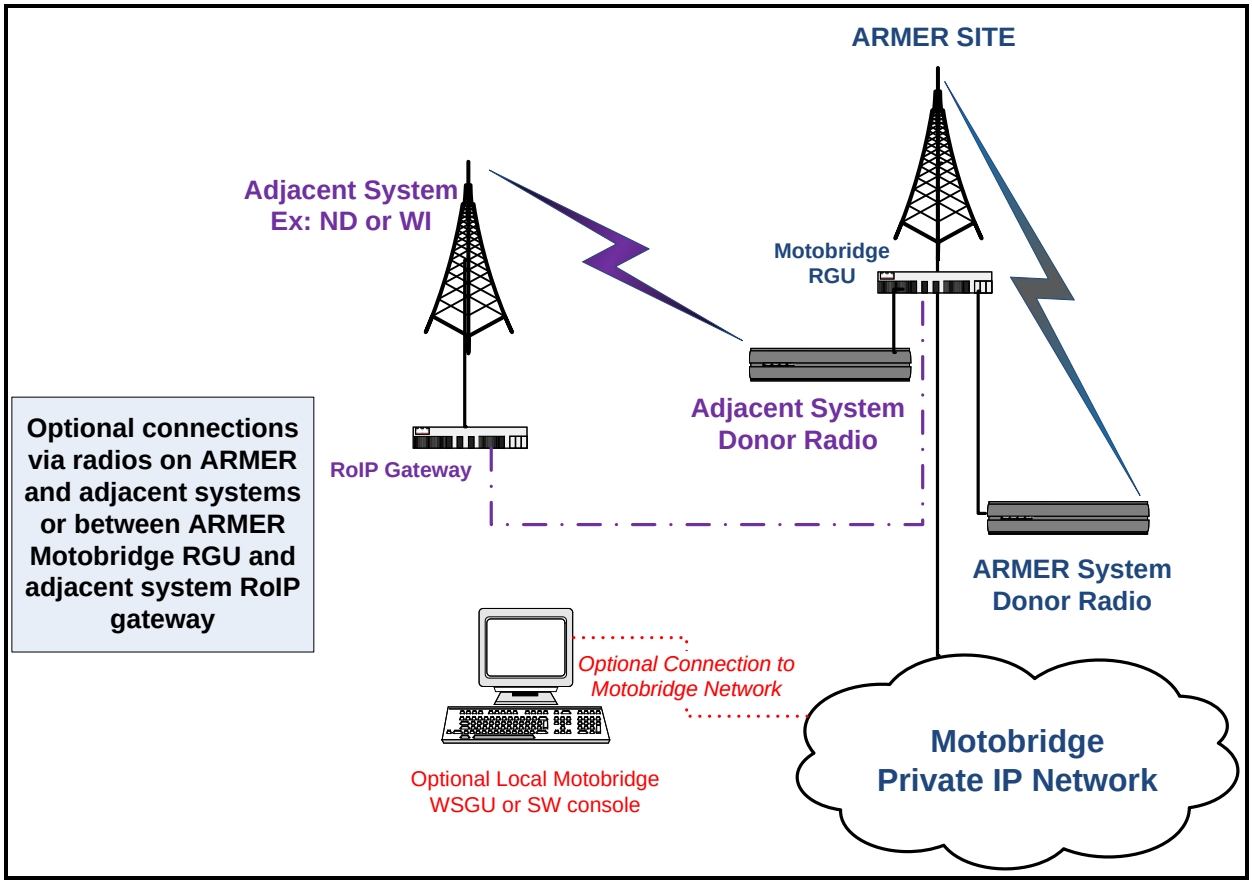

Figure 7 - System-to-System Connections

7.1 System-to-System Operations

Operation plans and procedures for these types of connections will require coordination and agreements with entities in other areas outside the jurisdiction of the Minnesota SRB. Each agreement and connection of this type will likely have different procedural and technical configurations. Development of these agreements and connections requires updating of the operational standards and guidelines for each of these Interop System configurations.

8. Dispatch Resources

As detailed earlier, some Interop System resources, such as the VLAW31, 8CALL90, and 8TAC9X stations are available to the Motorola MCC7500 or Gold Elite dispatch consoles used on the ARMER system. Provisioning these channels on a local dispatch console is contingent on the availability of ARMER console resources in a zone and the number of local console resources already utilized. ARMER dispatch centers that want to add these Interop System stations in their area to their consoles should consult with MnDOT technical staff. As outlined in the ARMER standards, dispatch centers that incorporate these resources into their dispatch centers are also making a commitment to monitor these interoperability channels and respond to user requests for assistance.

Only county dispatch centers deploying a Motobridge™ dispatch position with a secure connection to the private Motobridge™ IP network used by the Interop System can fully utilize the VFS stations. Counties wishing to access these Interop System Resources should also consult with MnDOT technical staff prior to purchasing Motobridge™ equipment and software, in order to verify the equipment and software procured is compatible with the Interop System and to arrange for connecting their Motobridge™ equipment to the Interop Systems private IP network.

Motobridge™ dispatch resources are available in multiple configurations. The least expensive option is to deploy the Motobridge™ dispatch software application on a locally supplied computer and work with MnDOT staff to determine the connection needed for this computer to communicate with the Interop System. This configuration is limited to control of up to 12 resources, but this may be adequate in many locations. The dispatch software-only configuration would also not allow the county to connect to any local radio channels if needed. The next level of Motobridge™ dispatch console is a Workstation Gateway Unit, or WSGU, connected to a PC loaded with the Motobridge™ dispatch software application. This configuration has the capability to connect to the Interop System but allows for connections to other local radio channels if needed.

9. Next Steps

The Cross Spectrum Interoperability System operations and training project also includes development of learning objectives and a training program to support the implementation of the operations plan. The training program, based on a train-the-trainer approach, will include the following:

- A well-articulated set of learning objectives detailing the skills, capabilities, and information public safety practitioners must possess to use the Interop System effectively and appropriately.
- Presentation materials (Microsoft PowerPoint presentation with narrative outlines, handout materials, and other elements) needed for an effective presentation addressing the learning objectives listed above.
- A set of practical learning scenarios designed as in-class tabletop exercises around which students can exercise and demonstrate an understanding of skills, capabilities, and information necessary to use the Interop System effectively and appropriately. The design of these scenarios uses tabletop exercises that do not include communications equipment.

ECN has reviewed the training plan with DPS, MnDOT, and the project steering committee and has modified the plan, as needed, prior to conducting two train-the-trainer sessions one in St Cloud and another in Mankato, Minnesota. ECN has now finalize all training materials and has provided a final training plan and supporting documentation to DPS.

ECN is also working with DPS and MnDOT to identify existing or new tools needed to support the ongoing operations and training needs of the Interop System. This includes developing a strategy for enabling Interop System users to identify which Interop Systems are deployed and available in each county, as well revising existing ARMER standards to account for new conditions and capabilities presented by the deployment of the Interop System.

Appendix A – ARMER Standard Operations Guide

The standard mode of interoperability for an ARMER user moving outside their normal operational area would be to remain on ARMER. The roaming ARMER user would hail the local county on the appropriate regional hailing talkgroup and be directed to the applicable local, regional, or statewide talkgroup as determined by the local dispatcher, incident commander, or incident communications plan. The local dispatcher may patch the operational, assigned talkgroup to a local radio resource, if needed, in accordance with current ARMER standards, NIMS, and Incident Command System (ICS) protocols. Figure A.1 shows the standard interoperability configuration for ARMER users operating in a county that has not migrated to ARMER.

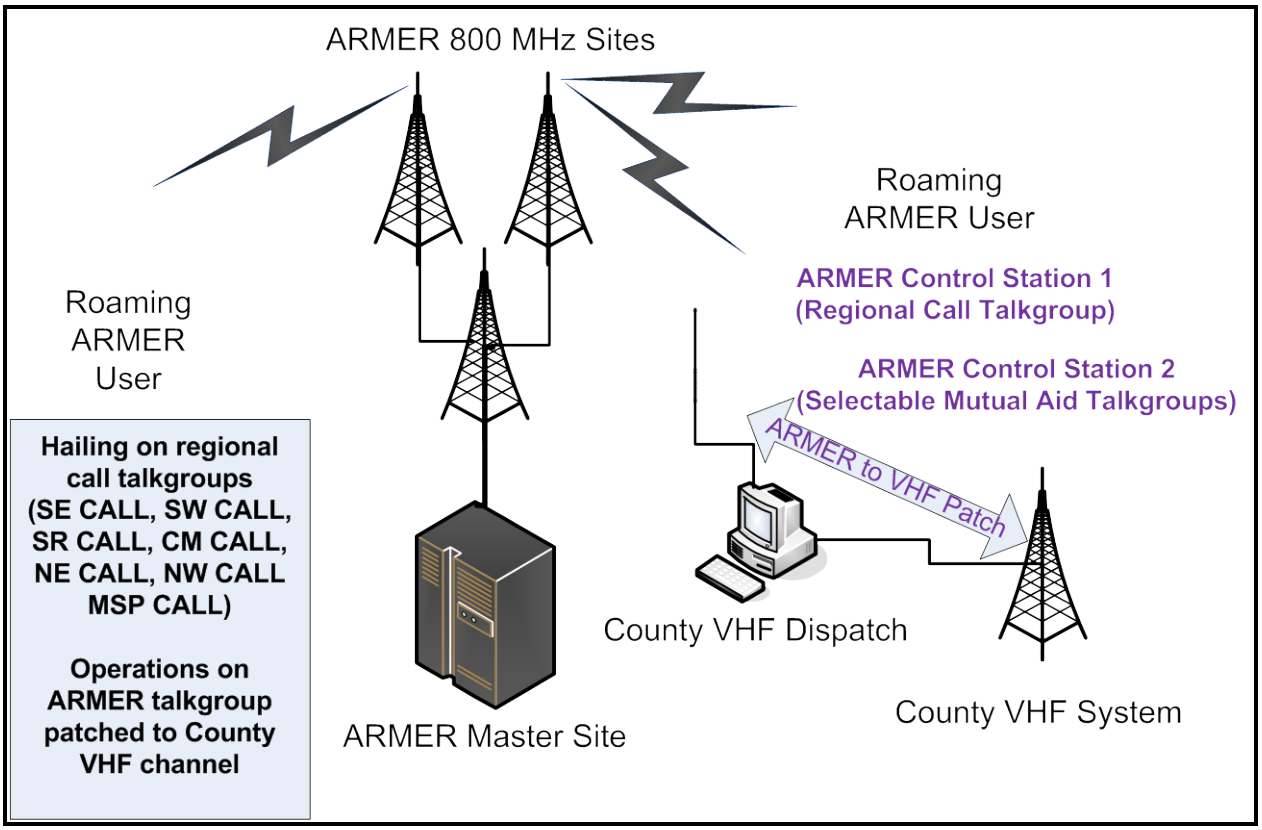

Figure A.1- ARMER Standard Interoperability Configuration

Table A.1 lists the regional hailing talkgroups for each ARMER region:

Table A.1 – Regional hailing talkgroups by region

ARMER Region	Regional Hailing Talkgroup
Metro	MSP CALL
Northeast	NE CALL
Northwest	NW CALL
Central	CM CALL
South Central	SR CALL
Southwest	SW CALL
Southeast	SE CALL

Based on ARMER standards, as well as procedures outlined in the National Incident Management System (NIMS) and Incident Management System (IMS), all users shall utilize the following operational policies and conventions for conducting interoperable communications:

1. Users shall use plain language at all times.
2. Users should initially identify themselves in the following manner: agency name, followed by service branch or function designation, followed by call sign or unit number, such as "North EMS 512", "Elk River Police 512", "Stearns County Public Works 512", "State Patrol 512".
3. Users hailing a dispatch center outside their normal operational area should also identify the dispatch center or agency they are attempting to communicate with, such as “State Patrol”, “Lake County SO”, “Elk River PD”. The order of identifications, initiator and hailed party, may vary since law enforcement, fire and EMS agencies typically use different conventions.
4. Users should also indicate the resource they are hailing on, such as “NW Call”, “SW CALL”, etc.
5. Dispatchers may patch only one local resource in an area to one ARMER talkgroup per incident.
6. All participating entities shall use the ARMER System StatusBoard Application to track the use of ARMER talkgroup resources for anything other than short-term incidents, such as a rapidly moving chase.

7. The setup and break down of patches are the responsibility of the dispatch center controlling the incident or event. The dispatch center should break down patches as soon as practical after the incident ends or migrates to another jurisdiction.

The following are typical operations using standard ARMER interoperability resources:

1. An ARMER user moves into a region or county outside of their normal operational area.
2. An ARMER user hails the local dispatch center on the appropriate hailing talkgroup and requests instructions. The order of identifications, initiator and hailed party, may vary since law enforcement, fire and EMS agencies typically use different conventions.
   a. Example: ARMER user hails on NW CALL
   b. “Itasca SO 512, Beltrami SO on NW CALL”
3. The local dispatch center responds to the ARMER user, determines the nature of the incident, and determines if a patch to a local radio channel is necessary. If ARMER Interoperability Pool Talkgroups are to be used during an incident, the local dispatcher must reserve this resource using the ARMER System StatusBoard Application.
   a. Example: Beltrami dispatcher advises ARMER user to go to LTAC1 for task force communications and patches LTAC1 to Beltrami SO VHF radio channel.

      Dispatcher: “Beltrami SO, Itasca 512, go to LTAC 1”

      User: “Itasca 512, Beltrami SO on LTAC1”

      Dispatcher: “Itasca 512 you are patched to Beltrami SO MAIN, go ahead”
4. Upon termination of the incident, the local dispatch center disconnects the patch.

   Dispatcher: “Beltrami SO, Itasca 512, LTAC1 to Beltrami SO main patch is terminated, please return to NW CALL”

   User: “Itasca 512, copy, returning to NW CALL”
5. Once an incident using an ARMER Interoperability Pool Talkgroup ends, the local dispatcher must also release this resource on the ARMER System StatusBoard Application.

Appendix B – VLAW31 Sites and Naming Conventions

Interop Site	RAC	Gold Elite Name	MCC 7500 Name	Motobridge™ Name
Benson	CM	CM-VLAW31-Bens	CM-VLAW31-Benson	CM-VLAW31-Benson
Browns Valley	CM	CM-VLAW31-Brow	CM-VLAW31-Browns	CM-VLAW31-Browns Va
Buffalo	CM	CM-VLAW31-Buff	CM-VLAW31-Buffal	CM-VLAW31-Buffalo
Eagle Lake	CM	CM-VLAW31-Eagl	CM-VLAW31-Eagle	CM-VLAW31-Eagle Lak
Erhard	CM	CM-VLAW31-Erha	CM-VLAW31-Erhard	CM-VLAW31-Erhard
Freedhem	CM	CM-VLAW31-Free	CM-VLAW31-Freedh	CM-VLAW31-Freedhem
Freeport	CM	CM-VLAW31-Free	CM-VLAW31-Freepo	CM-VLAW31-Freeport
Gleenwood	CM	CM-VLAW31-Glee	CM-VLAW31-Gleenw	CM-VLAW31-Gleenwood
Hoffman	CM	CM-VLAW31-Hoff	CM-VLAW31-Hoffma	CM-VLAW31-Hoffman
Kent	CM	CM-VLAW31-Kent	CM-VLAW31-Kent	CM-VLAW31-Kent
Kimball	CM	CM-VLAW31-Kimb	CM-VLAW31-Kimbal	CM-VLAW31-Kimball
Litchfield	CM	CM-VLAW31-Litc	CM-VLAW31-Litchf	CM-VLAW31-Litchfiel
Long Prairie	CM	CM-VLAW31-Long	CM-VLAW31-Long P	CM-VLAW31-Long Prai
Morris New	CM	CM-VLAW31-Morr	CM-VLAW31-Morris	CM-VLAW31-Morris Ne
New London	CM	CM-VLAW31-New	CM-VLAW31-New Lo	CM-VLAW31-New Londo
Onamia	CM	CM-VLAW31-Onam	CM-VLAW31-Onamia	CM-VLAW31-Onamia
Parkers Prairie	CM	CM-VLAW31-Park	CM-VLAW31-Parker	CM-VLAW31-Parkers P
Schumacher	CM	CM-VLAW31-Schu	CM-VLAW31-Schuma	CM-VLAW31-Schumache
Sebeka	CM	CM-VLAW31-Sebe	CM-VLAW31-Sebeka	CM-VLAW31-Sebeka
St. Cloud	CM	CM-VLAW31-St C	CM-VLAW31-St Clo	CM-VLAW31-St Cloud
Wheaton	CM	CM-VLAW31-Whea	CM-VLAW31-Wheato	CM-VLAW31-Wheaton
Zimmerman	CM	CM-VLAW31-Zimm	CM-VLAW31-Zimmer	CM-VLAW31-Zimmerman
Alden	SE	SE-VLAW31-Alde	SE-VLAW31-Alden	SE-VLAW31-Alden
Alma	SE	SE-VLAW31-Alma	SE-VLAW31-Alma	SE-VLAW31-Alma
Amherst	SE	SE-VLAW31-Amhe	SE-VLAW31-Amhers	SE-VLAW31-Amherst
Caledonia	SE	SE-VLAW31-Cale	SE-VLAW31-Caledo	SE-VLAW31-Caledonia
Cannon Falls	SE	SE-VLAW31-Cann	SE-VLAW31-Cannon	SE-VLAW31-Cannon Fa
Dodge Center	SE	SE-VLAW31-Dodg	SE-VLAW31-Dodge	SE-VLAW31-Dodge Cen
Dresbach	SE	SE-VLAW31-Dres	SE-VLAW31-Dresba	SE-VLAW31-Dresbach
Elkton	SE	SE-VLAW31-Elkt	SE-VLAW31-Elkton	SE-VLAW31-Elkton
Lonsdale	SE	SE-VLAW31-Lons	SE-VLAW31-Lonsda	SE-VLAW31-Lonsdale
Oakland Woods	SE	SE-VLAW31-Oakl	SE-VLAW31-Oaklan	SE-VLAW31-Oakland W
Owatonna	SE	SE-VLAW31-Owat	SE-VLAW31-Owaton	SE-VLAW31-Owatonna
Red Wing	SE	SE-VLAW31-Red	SE-VLAW31-Red Wi	SE-VLAW31-Red Wing
Viola	SE	SE-VLAW31-Viol	SE-VLAW31-Viola	SE-VLAW31-Viola
Wilson	SE	SE-VLAW31-Wils	SE-VLAW31-Wilson	SE-VLAW31-Wilson
Arrowhead	NE	NE-VLAW31-Arro	NE-VLAW31-Arrowh	NE-VLAW31-Arrowhead
Baxter	NE	NE-VLAW31-Baxt	NE-VLAW31-Baxter	NE-VLAW31-Baxter
Border	NE	NE-VLAW31-Bord	NE-VLAW31-Border	NE-VLAW31-Border

Interop Site	RAC	Gold Elite Name	MCC 7500 Name	Motobridge™ Name
Cass Lake	NE	NE-VLAW31-Cass	NE-VLAW31-Cass L	NE-VLAW31-Cass Lake
Deer River	NE	NE-VLAW31-Deer	NE-VLAW31-Deer R	NE-VLAW31-Deer Rive
Duluth	NE	NE-VLAW31-Dulu	NE-VLAW31-Duluth	NE-VLAW31-Duluth
Effie	NE	NE-VLAW31-Effi	NE-VLAW31-Effie	NE-VLAW31-Effie
Ely	NE	NE-VLAW31-Ely	NE-VLAW31-Ely	NE-VLAW31-Ely
Emily	NE	NE-VLAW31-Emil	NE-VLAW31-Emily	NE-VLAW31-Emily
Gheen Hill	NE	NE-VLAW31-Ghee	NE-VLAW31-Gheen	NE-VLAW31-Gheen Hil
Grand Portage	NE	NE-VLAW31-Gran	NE-VLAW31-Grand	NE-VLAW31-Grand Por
Gunflint East	NE	NE-VLAW31-Gunf	NE-VLAW31-Gunfli	NE-VLAW31-Gunflint
Kabetogama	NE	NE-VLAW31-Kabe	NE-VLAW31-Kabeto	NE-VLAW31-Kabetogam
Lawler	NE	NE-VLAW31-Lawl	NE-VLAW31-Lawler	NE-VLAW31-Lawler
Leader	NE	NE-VLAW31-Lead	NE-VLAW31-Leader	NE-VLAW31-Leader
Little Fork	NE	NE-VLAW31-Litt	NE-VLAW31-Little	NE-VLAW31-Little Fo
Maple Hill	NE	NE-VLAW31-Mapl	NE-VLAW31-Maple	NE-VLAW31-Maple Hil
Margie	NE	NE-VLAW31-Marg	NE-VLAW31-Margie	NE-VLAW31-Margie
Nashwauk(County)	NE	NE-VLAW31-Nash	NE-VLAW31-Nashwa	NE-VLAW31-Nashwauk(
Nickerson	NE	NE-VLAW31-Nick	NE-VLAW31-Nicker	NE-VLAW31-Nickerson
Northome	NE	NE-VLAW31-Nort	NE-VLAW31-Northo	NE-VLAW31-Northome
Pine City	NE	NE-VLAW31-Pine	NE-VLAW31-Pine C	NE-VLAW31-Pine City
Quadna	NE	NE-VLAW31-Quad	NE-VLAW31-Quadna	NE-VLAW31-Quadna
Schroder	NE	NE-VLAW31-Schr	NE-VLAW31-Schrod	NE-VLAW31-Schroder
Shaw	NE	NE-VLAW31-Shaw	NE-VLAW31-Shaw	NE-VLAW31-Shaw
Soudan	NE	NE-VLAW31-Soud	NE-VLAW31-Soudan	NE-VLAW31-Soudan
Tofte	NE	NE-VLAW31-Toft	NE-VLAW31-Tofte	NE-VLAW31-Tofte
Virginia	NE	NE-VLAW31-Virg	NE-VLAW31-Virgin	NE-VLAW31-Virginia
Wales	NE	NE-VLAW31-Wale	NE-VLAW31-Wales	NE-VLAW31-Wales
Whyte	NE	NE-VLAW31-Whyt	NE-VLAW31-Whyte	NE-VLAW31-Whyte
Woodland	NE	NE-VLAW31-Wood	NE-VLAW31-Woodla	NE-VLAW31-Woodland
Ada	NW	NW-VLAW31-Ada	NW-VLAW31-Ada	NW-VLAW31-Ada
Bagley	NW	NW-VLAW31-Bagl	NW-VLAW31-Bagley	NW-VLAW31-Bagley
Bemidji	NW	NW-VLAW31-Bemi	NW-VLAW31-Bemidj	NW-VLAW31-Bemidji
Crookston	NW	NW-VLAW31-Croo	NW-VLAW31-Crooks	NW-VLAW31-Crookston
Dorothy	NW	NW-VLAW31-Doro	NW-VLAW31-Doroth	NW-VLAW31-Dorothy
Greenbush	NW	NW-VLAW31-Gree	NW-VLAW31-Greenb	NW-VLAW31-Greenbush
Hawley	NW	NW-VLAW31-Hawl	NW-VLAW31-Hawley	NW-VLAW31-Hawley
Lake Bronson	NW	NW-VLAW31-Lake	NW-VLAW31-Lake B	NW-VLAW31-Lake Bron
Mahnomen	NW	NW-VLAW31-Mahn	NW-VLAW31-Mahnom	NW-VLAW31-Mahnomen
Mantrap	NW	NW-VLAW31-Mant	NW-VLAW31-Mantra	NW-VLAW31-Mantrap
Mentor	NW	NW-VLAW31-Ment	NW-VLAW31-Mentor	NW-VLAW31-Mentor
Middle River	NW	NW-VLAW31-Midd	NW-VLAW31-Middle	NW-VLAW31-Middle Ri
Northcote	NW	NW-VLAW31-Nort	NW-VLAW31-Northc	NW-VLAW31-Northcote
Roosevelt	NW	NW-VLAW31-Roos	NW-VLAW31-Roosev	NW-VLAW31-Roosevelt

Interop Site	RAC	Gold Elite Name	MCC 7500 Name	Motobridge™ Name
Thorhult	NW	NW-VLAW31-Thor	NW-VLAW31-Thorhu	NW-VLAW31-Thorhult
Warren	NW	NW-VLAW31-Warr	NW-VLAW31-Warren	NW-VLAW31-Warren
Waskish	NW	NW-VLAW31-Wask	NW-VLAW31-Waskis	NW-VLAW31-Waskish
Winter Silo	NW	NW-VLAW31-Wint	NW-VLAW31-Winter	NW-VLAW31-Winter Si
Wolf Lake	NW	NW-VLAW31-Wolf	NW-VLAW31-Wolf L	NW-VLAW31-Wolf Lake
Biscay	SC	SC-VLAW31-Bisc	SC-VLAW31-Biscay	SC-VLAW31-Biscay
Blue Earth	SC	SC-VLAW31-Blue	SC-VLAW31-Blue E	SC-VLAW31-Blue Eart
Gaylord	SC	SC-VLAW31-Gayl	SC-VLAW31-Gaylor	SC-VLAW31-Gaylord
Janesville	SC	SC-VLAW31-Jane	SC-VLAW31-Janesv	SC-VLAW31-Janesvill
La Salle	SC	SC-VLAW31-La S	SC-VLAW31-La Sal	SC-VLAW31-La Salle
Mankato MSU	SC	SC-VLAW31-Mank	SC-VLAW31-Mankat	SC-VLAW31-Mankato M
Nicollet	SC	SC-VLAW31-Nico	SC-VLAW31-Nicoll	SC-VLAW31-Nicollet
Sherburn	SC	SC-VLAW31-Sher	SC-VLAW31-Sherbu	SC-VLAW31-Sherburn
Brewster	SW	SW-VLAW31-Brew	SW-VLAW31-Brewst	SW-VLAW31-Brewster
Canby	SW	SW-VLAW31-Canb	SW-VLAW31-Canby	SW-VLAW31-Canby
Chandler	SW	SW-VLAW31-Chan	SW-VLAW31-Chandl	SW-VLAW31-Chandler
Danube	SW	SW-VLAW31-Danu	SW-VLAW31-Danube	SW-VLAW31-Danube
Granite Falls	SW	SW-VLAW31-Gran	SW-VLAW31-Granit	SW-VLAW31-Granite F
Hardwick	SW	SW-VLAW31-Hard	SW-VLAW31-Hardwi	SW-VLAW31-Hardwick
Lake Benton	SW	SW-VLAW31-Lake	SW-VLAW31-Lake B	SW-VLAW31-Lake Bent
Madison	SW	SW-VLAW31-Madi	SW-VLAW31-Madiso	SW-VLAW31-Madison
Morton	SW	SW-VLAW31-Mort	SW-VLAW31-Morton	SW-VLAW31-Morton
Rushmore	SW	SW-VLAW31-Rush	SW-VLAW31-Rushmo	SW-VLAW31-Rushmore
Russel	SW	SW-VLAW31-Russ	SW-VLAW31-Russel	SW-VLAW31-Russel
Tracy	SW	SW-VLAW31-Trac	SW-VLAW31-Tracy	SW-VLAW31-Tracy
Wanda	SW	SW-VLAW31-Wand	SW-VLAW31-Wanda	SW-VLAW31-Wanda
Windom	SW	SW-VLAW31-Wind	SW-VLAW31-Windom	SW-VLAW31-Windom
Woods	SW	SW-VLAW31-Wood	SW-VLAW31-Woods	SW-VLAW31-Woods

Appendix C – VLAW31 Operations Guide

A non-ARMER (VHF) law enforcement agency (LEA) unit moving into an area that has transitioned to ARMER would utilize either local (county owned) VLAW31 resources or the VLAW31 resources provided in the Interop System to communicate with LEA users that operate on the ARMER system. Minnesota State Patrol (MSP) will monitor the VLAW31 resources provided in the Interop System. Links to the Interop System VLAW31 resources are also available to local ARMER system consoles (Motorola Gold Elite or MCC7500) in each county where sufficient console resources are available to do so. Figure C.1 shows a high-level diagram of the Interop System's VLAW31 configurations.

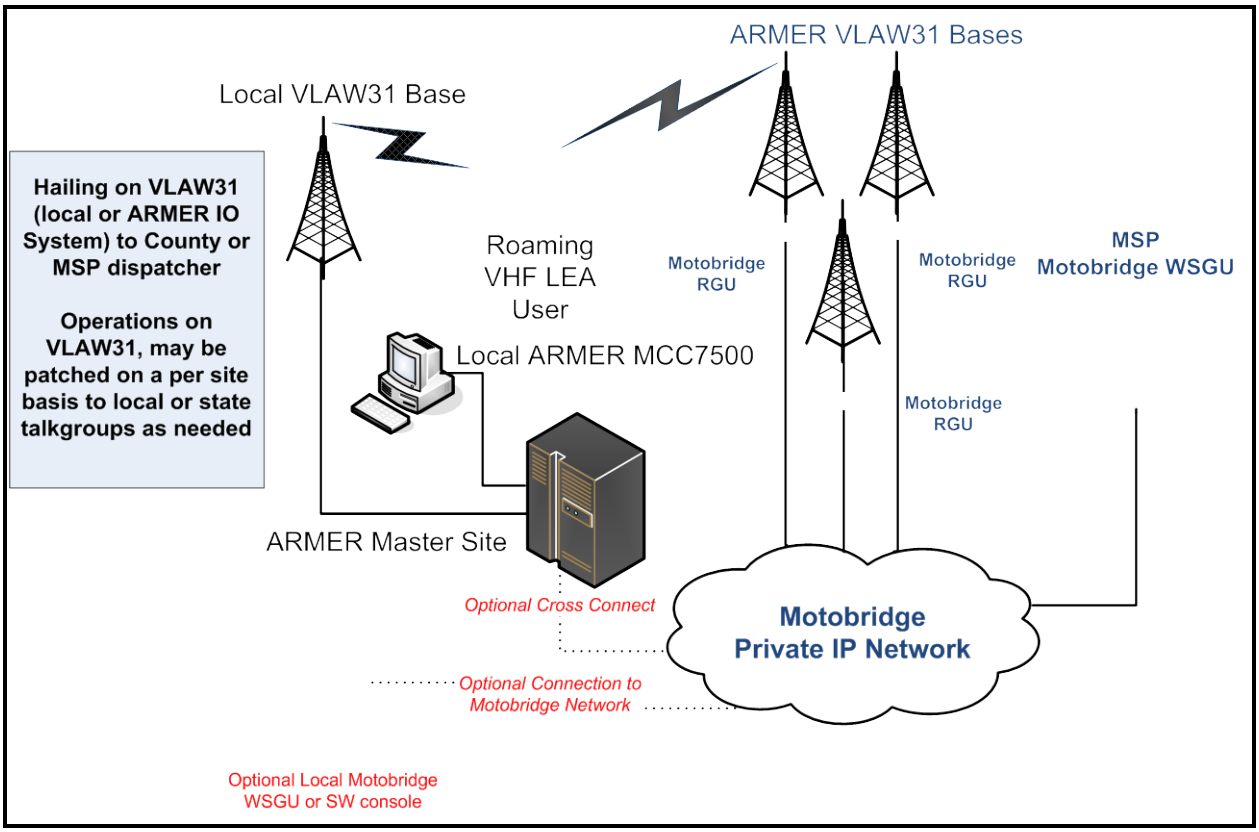

Figure C.1 Interop System VLAW 31 Stations

Based on ARMER standards, as well as procedures outlined in the National Incident Management System (NIMS) and Incident Management System (IMS), all users conducting interoperable communications on the Interop System shall utilize the following operational policies and conventions.

1. Users shall use plain language at all times.
2. Users should initially identify themselves in the following manner: agency name, followed by service branch or function designation, followed by call sign or unit number, such as "North EMS 512", "Elk River Police 512", "Stearns County Public Works 512", "State Patrol 512".
3. Users hailing a dispatch center outside their normal operational area should also identify the dispatch center or agency they are attempting to communicate with, such as “State Patrol”, “Lake County SO”, “Elk River PD”. The order of identifications, initiator and hailed party, may vary since law enforcement, fire and EMS agencies typically use different conventions.
4. Users should also indicate the resource they are hailing on, such as “VLAW31”.
5. Dispatchers may patch only one VLAW31 resource in an area to one ARMER talkgroup per incident.
6. All participating entities shall use the ARMER System StatusBoard Application to track the use of VLAW31 and ARMER talkgroup resources to maximize the visibility of the use of such resources for anything other than short-term incidents, such as a rapidly moving chase.
7. The setup and break down of patches are the responsibility of the dispatch center controlling the incident or event. Dispatchers should break down patches between VLAW31 and ARMER talkgroups or radio resources as soon as practical after the incident ends or migrates to another jurisdiction.

The following are typical operations using VLAW31 interoperability resources:

1. The VHF LEA user moves into a region or county operating on ARMER.
2. The VHF LEA user would hail the appropriate agency (local, county, or MSP) on VLAW31 and request assistance or instructions.
   a. Examples: VHF LEA user hails on VLAW31

      Hailing unit to local dispatcher: “Beltrami SO 512, Itasca SO on VLAW31”

      Hailed unit to State Patrol: “Beltrami SO 512, State Patrol”
3. The hailed dispatch center would respond to the VHF LEA user and determine the nature of the incident, or request for assistance. The hailed dispatch center would also determine which radio resources are necessary and patch those resources to the VLAW31 channel if needed. If Interop System VLAW31 stations or ARMER Interoperability Pool Talkgroups are to be used during an incident, the

local dispatcher must also reserve this resource using the ARMER System StatusBoard Application.

a. Examples: Hailed dispatch center advises unit to proceed with communications on local VLAW31 channel. This may be sufficient if the ARMER agency has retained VHF radios or is using dual mode (VHF/800 MHz) radios, in which case a patch to ARMER may be unnecessary:

   Local dispatcher: “Itasca SO, Beltrami 512, go ahead on VLAW31”

   State Patrol dispatcher: “State Patrol, Beltrami 512, go ahead on VLAW31”

b. Hailed dispatch center patches local or Interop System VLAW31 channel to ARMER talkgroup and advises units to proceed with communications:

   Local dispatcher: “Itasca SO, Beltrami 512, you are patched to Itasca SO, go ahead on VLAW31”

   State Patrol dispatcher: “State Patrol, Beltrami 512, you are patched to State Patrol 1, go ahead on VLAW31”

4. Upon termination of the incident, the hailed dispatch center disconnects the patch:

   a. Local dispatcher: “Itasca SO, Beltrami 512, patch to Itasca SO is terminated”

      Hailing unit: “Beltrami 512, copy, returning to Beltrami County primary”

   b. State Patrol dispatcher: “State Patrol, Beltrami 512, patch to State Patrol 1 is terminated”

      Hailing unit: “Beltrami 512, copy, returning to Beltrami County primary”

5. Once an incident using an ARMER Interoperability Pool Talkgroup or Interop System VLAW31 station ends, the local dispatcher must also release this resource on the ARMER System StatusBoard Application.

Appendix D - VFS Sites and Naming Conventions

Interop Site	RAC	Gold Elite Name	MCC 7500 Name	Motobridge™ Name
Benson	CM	CM-VFS-Benson	CM-VFS-Benson	CM-VFS-Benson
Browns Valley	CM	CM-VFS-Browns	CM-VFS-Browns Va	CM-VFS-Browns Valle
Buffalo	CM	CM-VFS-Buffalo	CM-VFS-Buffalo	CM-VFS-Buffalo
Eagle Lake	CM	CM-VFS-Eagle L	CM-VFS-Eagle Lak	CM-VFS-Eagle Lake
Erhard	CM	CM-VFS-Erhard	CM-VFS-Erhard	CM-VFS-Erhard
Freedhem	CM	CM-VFS-Freedhe	CM-VFS-Freedhem	CM-VFS-Freedhem
Freeport	CM	CM-VFS-Freepor	CM-VFS-Freeport	CM-VFS-Freeport
Gleenwood	CM	CM-VFS-Gleenwo	CM-VFS-Gleenwood	CM-VFS-Gleenwood
Hoffman	CM	CM-VFS-Hoffman	CM-VFS-Hoffman	CM-VFS-Hoffman
Kent	CM	CM-VFS-Kent	CM-VFS-Kent	CM-VFS-Kent
Kimball	CM	CM-VFS-Kimball	CM-VFS-Kimball	CM-VFS-Kimball
Litchfield	CM	CM-VFS-Litchfi	CM-VFS-Litchfiel	CM-VFS-Litchfield
Long Prairie	CM	CM-VFS-Long Pr	CM-VFS-Long Prai	CM-VFS-Long Prairie
Morris New	CM	CM-VFS-Morris	CM-VFS-Morris Ne	CM-VFS-Morris New
New London	CM	CM-VFS-New Lon	CM-VFS-New Londo	CM-VFS-New London
Onamia	CM	CM-VFS-Onamia	CM-VFS-Onamia	CM-VFS-Onamia
Parkers Prairie	CM	CM-VFS-Parkers	CM-VFS-Parkers P	CM-VFS-Parkers Prai
Schumacher	CM	CM-VFS-Schumac	CM-VFS-Schumache	CM-VFS-Schumacher
Sebeka	CM	CM-VFS-Sebeka	CM-VFS-Sebeka	CM-VFS-Sebeka
St. Cloud	CM	CM-VFS-St Clou	CM-VFS-St Cloud	CM-VFS-St Cloud
Wheaton	CM	CM-VFS-Wheaton	CM-VFS-Wheaton	CM-VFS-Wheaton
Zimmerman	CM	CM-VFS-Zimmerm	CM-VFS-Zimmerman	CM-VFS-Zimmerman
Alden	SE	SE-VFS-Alden	SE-VFS-Alden	SE-VFS-Alden
Alma	SE	SE-VFS-Alma	SE-VFS-Alma	SE-VFS-Alma
Amherst	SE	SE-VFS-Amherst	SE-VFS-Amherst	SE-VFS-Amherst
Caledonia	SE	SE-VFS-Caledon	SE-VFS-Caledonia	SE-VFS-Caledonia
Cannon Falls	SE	SE-VFS-Cannon	SE-VFS-Cannon Fa	SE-VFS-Cannon Falls
Dodge Center	SE	SE-VFS-Dodge C	SE-VFS-Dodge Cen	SE-VFS-Dodge Center
Dresbach	SE	SE-VFS-Dresbac	SE-VFS-Dresbach	SE-VFS-Dresbach
Elkton	SE	SE-VFS-Elkton	SE-VFS-Elkton	SE-VFS-Elkton
Lonsdale	SE	SE-VFS-Lonsdal	SE-VFS-Lonsdale	SE-VFS-Lonsdale
Oakland Woods	SE	SE-VFS-Oakland	SE-VFS-Oakland W	SE-VFS-Oakland Wood
Owatonna	SE	SE-VFS-Owatonn	SE-VFS-Owatonna	SE-VFS-Owatonna
Red Wing	SE	SE-VFS-Red Win	SE-VFS-Red Wing	SE-VFS-Red Wing
Viola	SE	SE-VFS-Viola	SE-VFS-Viola	SE-VFS-Viola
Wilson	SE	SE-VFS-Wilson	SE-VFS-Wilson	SE-VFS-Wilson
Arrowhead	NE	NE-VFS-Arrowhe	NE-VFS-Arrowhead	NE-VFS-Arrowhead
Baxter	NE	NE-VFS-Baxter	NE-VFS-Baxter	NE-VFS-Baxter
Border	NE	NE-VFS-Border	NE-VFS-Border	NE-VFS-Border

Interop Site	RAC	Gold Elite Name	MCC 7500 Name	Motobridge™ Name
Cass Lake	NE	NE-VFS-Cass La	NE-VFS-Cass Lake	NE-VFS-Cass Lake
Deer River	NE	NE-VFS-Deer Ri	NE-VFS-Deer Rive	NE-VFS-Deer River
Duluth	NE	NE-VFS-Duluth	NE-VFS-Duluth	NE-VFS-Duluth
Effie	NE	NE-VFS-Effie	NE-VFS-Effie	NE-VFS-Effie
Ely	NE	NE-VFS-Ely	NE-VFS-Ely	NE-VFS-Ely
Emily	NE	NE-VFS-Emily	NE-VFS-Emily	NE-VFS-Emily
Gheen Hill	NE	NE-VFS-Gheen H	NE-VFS-Gheen Hil	NE-VFS-Gheen Hill
Grand Portage	NE	NE-VFS-Grand P	NE-VFS-Grand Por	NE-VFS-Grand Portag
Gunflint East	NE	NE-VFS-Gunflin	NE-VFS-Gunflint	NE-VFS-Gunflint Eas
Kabetogama	NE	NE-VFS-Kabetog	NE-VFS-Kabetogam	NE-VFS-Kabetogama
Lawler	NE	NE-VFS-Lawler	NE-VFS-Lawler	NE-VFS-Lawler
Leader	NE	NE-VFS-Leader	NE-VFS-Leader	NE-VFS-Leader
Little Fork	NE	NE-VFS-Little	NE-VFS-Little Fo	NE-VFS-Little Fork
Maple Hill	NE	NE-VFS-Maple H	NE-VFS-Maple Hil	NE-VFS-Maple Hill
Margie	NE	NE-VFS-Margie	NE-VFS-Margie	NE-VFS-Margie
Nashwauk(County)	NE	NE-VFS-Nashwau	NE-VFS-Nashwauk(	NE-VFS-Nashwauk(Cou
Nickerson	NE	NE-VFS-Nickers	NE-VFS-Nickerson	NE-VFS-Nickerson
Northome	NE	NE-VFS-Northom	NE-VFS-Northome	NE-VFS-Northome
Pine City	NE	NE-VFS-Pine Ci	NE-VFS-Pine City	NE-VFS-Pine City
Quadna	NE	NE-VFS-Quadna	NE-VFS-Quadna	NE-VFS-Quadna
Schroder	NE	NE-VFS-Schrode	NE-VFS-Schroder	NE-VFS-Schroder
Shaw	NE	NE-VFS-Shaw	NE-VFS-Shaw	NE-VFS-Shaw
Soudan	NE	NE-VFS-Soudan	NE-VFS-Soudan	NE-VFS-Soudan
Tofte	NE	NE-VFS-Tofte	NE-VFS-Tofte	NE-VFS-Tofte
Virginia	NE	NE-VFS-Virgini	NE-VFS-Virginia	NE-VFS-Virginia
Wales	NE	NE-VFS-Wales	NE-VFS-Wales	NE-VFS-Wales
Whyte	NE	NE-VFS-Whyte	NE-VFS-Whyte	NE-VFS-Whyte
Woodland	NE	NE-VFS-Woodlan	NE-VFS-Woodland	NE-VFS-Woodland
Ada	NW	NW-VFS-Ada	NW-VFS-Ada	NW-VFS-Ada
Bagley	NW	NW-VFS-Bagley	NW-VFS-Bagley	NW-VFS-Bagley
Bemidji	NW	NW-VFS-Bemidji	NW-VFS-Bemidji	NW-VFS-Bemidji
Crookston	NW	NW-VFS-Crookst	NW-VFS-Crookston	NW-VFS-Crookston
Dorothy	NW	NW-VFS-Dorothy	NW-VFS-Dorothy	NW-VFS-Dorothy
Greenbush	NW	NW-VFS-Greenbu	NW-VFS-Greenbush	NW-VFS-Greenbush
Hawley	NW	NW-VFS-Hawley	NW-VFS-Hawley	NW-VFS-Hawley
Lake Bronson	NW	NW-VFS-Lake Br	NW-VFS-Lake Bron	NW-VFS-Lake Bronson
Mahnomen	NW	NW-VFS-Mahnome	NW-VFS-Mahnomen	NW-VFS-Mahnomen
Mantrap	NW	NW-VFS-Mantrap	NW-VFS-Mantrap	NW-VFS-Mantrap
Mentor	NW	NW-VFS-Mentor	NW-VFS-Mentor	NW-VFS-Mentor
Middle River	NW	NW-VFS-Middle	NW-VFS-Middle Ri	NW-VFS-Middle River
Northcote	NW	NW-VFS-Northco	NW-VFS-Northcote	NW-VFS-Northcote
Roosevelt	NW	NW-VFS-Rooseve	NW-VFS-Roosevelt	NW-VFS-Roosevelt

Interop Site	RAC	Gold Elite Name	MCC 7500 Name	Motobridge™ Name
Thorhult	NW	NW-VFS-Thorhul	NW-VFS-Thorhult	NW-VFS-Thorhult
Warren	NW	NW-VFS-Warren	NW-VFS-Warren	NW-VFS-Warren
Waskish	NW	NW-VFS-Waskish	NW-VFS-Waskish	NW-VFS-Waskish
Winter Silo	NW	NW-VFS-Winter	NW-VFS-Winter Si	NW-VFS-Winter Silo
Wolf Lake	NW	NW-VFS-Wolf La	NW-VFS-Wolf Lake	NW-VFS-Wolf Lake
Biscay	SC	SC-VFS-Biscay	SC-VFS-Biscay	SC-VFS-Biscay
Blue Earth	SC	SC-VFS-Blue Ea	SC-VFS-Blue Eart	SC-VFS-Blue Earth
Gaylord	SC	SC-VFS-Gaylord	SC-VFS-Gaylord	SC-VFS-Gaylord
Janesville	SC	SC-VFS-Janesvi	SC-VFS-Janesvill	SC-VFS-Janesville
La Salle	SC	SC-VFS-La Sall	SC-VFS-La Salle	SC-VFS-La Salle
Mankato MSU	SC	SC-VFS-Mankato	SC-VFS-Mankato M	SC-VFS-Mankato MSU
Nicollet	SC	SC-VFS-Nicolle	SC-VFS-Nicollet	SC-VFS-Nicollet
Sherburn	SC	SC-VFS-Sherbur	SC-VFS-Sherburn	SC-VFS-Sherburn
Brewster	SW	SW-VFS-Brewste	SW-VFS-Brewster	SW-VFS-Brewster
Canby	SW	SW-VFS-Canby	SW-VFS-Canby	SW-VFS-Canby
Chandler	SW	SW-VFS-Chandle	SW-VFS-Chandler	SW-VFS-Chandler
Danube	SW	SW-VFS-Danube	SW-VFS-Danube	SW-VFS-Danube
Granite Falls	SW	SW-VFS-Granite	SW-VFS-Granite F	SW-VFS-Granite Fall
Hardwick	SW	SW-VFS-Hardwic	SW-VFS-Hardwick	SW-VFS-Hardwick
Lake Benton	SW	SW-VFS-Lake Be	SW-VFS-Lake Bent	SW-VFS-Lake Benton
Madison	SW	SW-VFS-Madison	SW-VFS-Madison	SW-VFS-Madison
Morton	SW	SW-VFS-Morton	SW-VFS-Morton	SW-VFS-Morton
Rushmore	SW	SW-VFS-Rushmor	SW-VFS-Rushmore	SW-VFS-Rushmore
Russel	SW	SW-VFS-Russel	SW-VFS-Russel	SW-VFS-Russel
Tracy	SW	SW-VFS-Tracy	SW-VFS-Tracy	SW-VFS-Tracy
Wanda	SW	SW-VFS-Wanda	SW-VFS-Wanda	SW-VFS-Wanda
Windom	SW	SW-VFS-Windom	SW-VFS-Windom	SW-VFS-Windom
Woods	SW	SW-VFS-Woods	SW-VFS-Woods	SW-VFS-Woods

Appendix E – VFS Operations Guide

The Interop System VFS resources or locally operated stations on VFIRE23 and VMED28 primarily provide interoperability between VHF fire users or VHF EMS users moving into a county operating on ARMER. In either case, a VHF fire or EMS user would hail the appropriate dispatch center, and that dispatch center would then determine the appropriate link for ongoing communications based on current ARMER protocols and standards, as well as local conditions. Initial hailing should occur on the designated hailing channel for that area, either VCALL10 or MNCOMM, as designated in Appendix F.

A dispatch center with access to an Interop System VFS, using a Motobridge™ WSGU or software only dispatch application, may also select one of the national VHF interoperability channels, VTAC11-VTAC14. Dispatchers can select these non-discipline specific channels on each VFS and use them for interagency communications as part of an incident communications plan.

Figure E.1 provides a high-level diagram of the Interop System VFS station configuration.

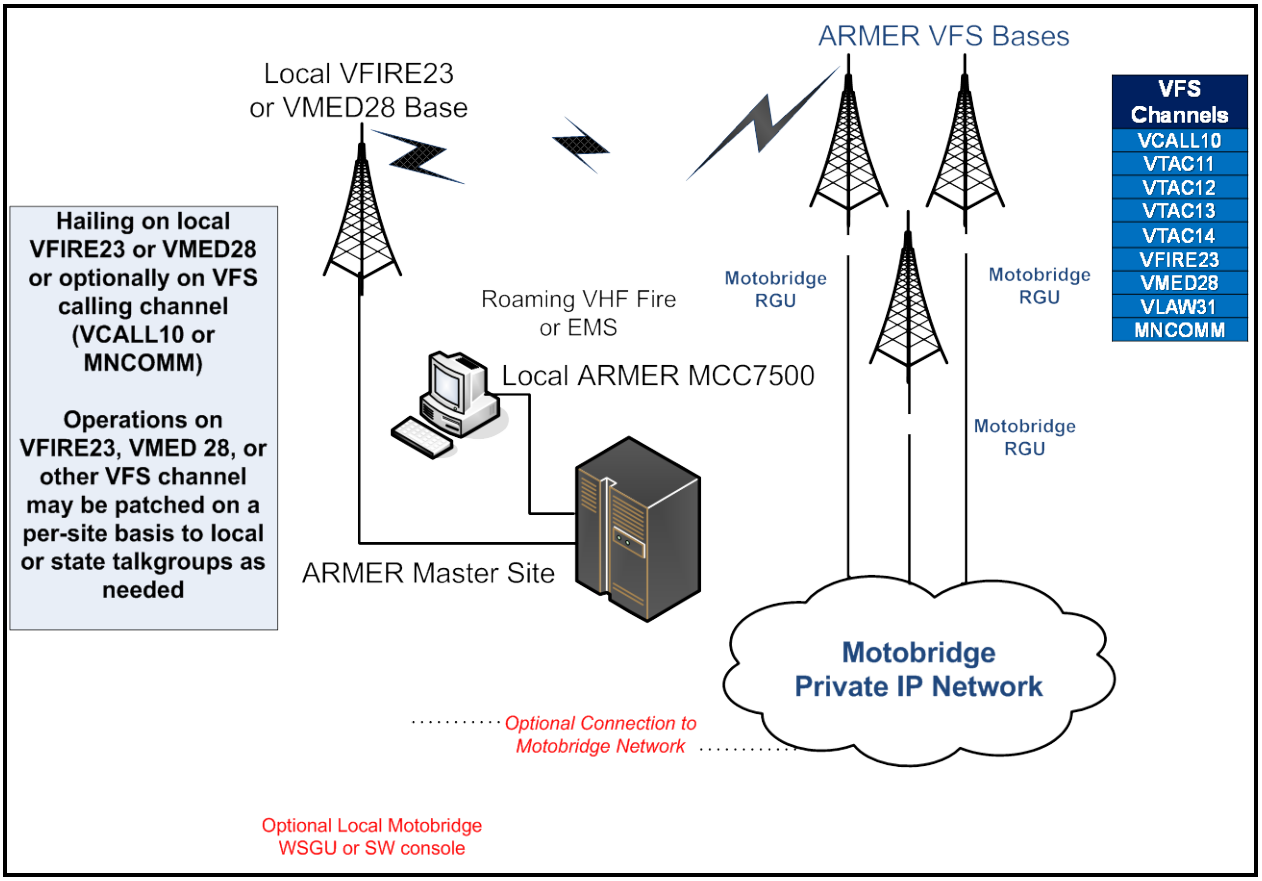

Figure E.1 – Interop System VFS Stations

Based on ARMER standards, as well as procedures outlined in the National Incident Management System (NIMS) and Incident Management System (IMS), all users conducting interoperable communications on the Interop System using VFS resources shall utilize the following operational policies and conventions on local VFIRE23, or local VMED28 resources.

1. Users shall use plain language at all times.
2. Users should initially identify themselves in the following manner: agency name, followed by service branch or function designation, followed by call sign or unit number, such as "North EMS 512", "Elk River Police 512", "Stearns County Public Works 512", "State Patrol 512".
3. Users hailing a dispatch center outside their normal operational area should also identify the dispatch center or agency they are attempting to communicate with, such as “State Patrol”, “Lake County SO”, “Elk River PD”.

4. Users should also indicate the resource they are hailing on, such as “VCALL10”, “MNCOMM”, “VMED28”, or “VFIRE23”.
5. Dispatchers may patch only one VFS channel or local VFIRE23 or VMED28 station in an area to one ARMER talkgroup per incident, regardless of whether the use of a channel on the VFS or local VFIRE23 and VMED28 channel is for interoperable communications.
6. All participating entities shall use the ARMER System StatusBoard Application to track the use of VFS channels, local VFIRE23, or VEMD28 channels and ARMER talkgroup resources to maximize the visibility of the use of such resources.
7. The setup and break down of patches are the responsibility of the dispatch center controlling the incident or event. Dispatchers should break down patches between VFS or local resources and ARMER talkgroups as soon as practical after the incident ends or migrates to another jurisdiction.

Several potential operational scenarios for use of either the VFS resources, or local VFIRE23 or VMED28 stations may be appropriate. The following are some sample scenarios.

VHF radio user operating in an ARMER county with local VFIRE23 or VMED28:

1. The VHF radio user moves into a region or county operating on ARMER.
2. The VHF radio user would hail the appropriate agency on VFIRE23 or VMED28 and request assistance or instructions.
   a. Examples: VHF radio user hails on VFIRE23

      Hailing user: “Beltrami Fire 12, Itasca County on VFIRE23”
3. The hailed dispatch center would respond to the VHF radio user and determine the nature of the incident or request for assistance. The hailed dispatch center would also determine which radio resources are necessary and patch those resources to an ARMER talkgroup if needed. If Interop System VFS channels or ARMER Interoperability Pool Talkgroups are to be used during an incident, the local dispatcher must also reserve this resource using the ARMER System StatusBoard Application.
   a. Example: Hailed dispatch center advises unit to proceed with communications on local VFIRE23 channel. This may be sufficient if the ARMER agency has retained VHF radios or is using dual mode (VHF/800 MHz) radios, in which case a patch to ARMER may not be necessary.

Hailed dispatcher: “Itasca County, Beltrami Fire 12, go ahead on VFIRE23”

b. If a patch is necessary, the hailed dispatch center patches the local VFIRE23 channel to an ARMER talkgroup and advises units to proceed with communications.

   Hailed dispatcher: “Itasca, Beltrami Fire 12, you are patched to Itasca Fire North, go ahead on VIFRE23”

4. Upon termination of the incident, the hailed dispatch center disconnects the patch.

   Hailed dispatcher: “Itasca, Beltrami Fire 12, patch to Itasca Fire North terminated” ”

   Hailing unit: “Beltrami Fire 12, copy, returning to Beltrami County primary”

VHF radio user operating in an ARMER county with access to VFS resources:

1. The VHF radio user moves into a region or county operating on ARMER.
2. The VHF radio user would hail the appropriate agency on either VCALL10 or MNCOMM and request assistance or instructions.

   a. Examples: VHF radio user hails on VCALL10

      Hailing unit: “Beltrami Fire 12, Itasca County on VCALL10”

3. The hailed dispatch center would respond to the VHF radio user and determine the nature of the incident or request for assistance. The hailed dispatch center would also determine which radio resources are necessary and patch those resources to an ARMER talkgroup if needed. If an ARMER Interoperability Pool Talkgroup or Interop System VFS channel is to be used during an incident, the local dispatcher must also reserve this resource on the ARMER System StatusBoard Application.

   a. Examples: Hailed dispatch center advises unit to proceed with request on VCALL10 channel:

      Dispatcher: “Itasca County, Beltrami Fire 12, go ahead on VCALL10”

   b. Once the nature of the request is determined, the hailed dispatch center directs the unit to proceed to an operations channel, patches that channel to an ARMER talkgroup, and advises units to proceed with communications.

      Dispatcher: “Itasca, Itasca Incident Command, VTAC11 patched to ITASCA event 1 for incoming responder Beltrami Fire 12”

Local Unit: “Itasca Incident Command, Copy”

Dispatcher: “Itasca, Beltrami Fire 12, go to VTAC11 for incident command. You are patched to ITASCA Event 1.”

Hailing unit: “Beltrami Fire 12, ITASCA, copy, selecting VTAC11 for incident command”

Hailing unit: “Beltrami Fire 12, ITASCA Incident Command”

Local Unit: “Itasca Incident Command, Beltrami Fire 12, proceed to command post for further instructions.”

Hailing unit: “Beltrami Fire 12, copy, proceeding to command post”

4. Upon termination of the incident, the hailed dispatch center breaks down the patch, notifies users, and returns VFS to VCALL10 or MNCOMM home channel.

   Dispatcher: “Itasca, Beltrami Fire 12, Itasca Incident Command, patch of VTAC11 to ITASCA Event 1 terminated”

   Hailing unit: “Beltrami Fire 12, copy, returning to Beltrami County primary”

   Local unit: “Itasca Incident Command, copy”

   Dispatcher unit: “Itasca to all units, returning station to VCALL10”

5. Once an incident using an ARMER Interoperability Pool Talkgroup or Interop System VCALL10 station ends, the local dispatcher must also release this resource on the ARMER System StatusBoard Application.

Appendix F – VFS Hailing Channels

Interop Site	RAC	Hailing Channel
Benson	CM	VCALL10
Browns Valley	CM	VCALL10
Buffalo	CM	VCALL10
Eagle Lake	CM	VCALL10
Erhard	CM	VCALL10
Freedhem	CM	VCALL10
Freeport	CM	VCALL10
Gleenwood	CM	VCALL10
Hoffman	CM	VCALL10
Kent	CM	VCALL10
Kimball	CM	VCALL10
Litchfield	CM	VCALL10
Long Prairie	CM	VCALL10
Morris New	CM	VCALL10
New London	CM	VCALL10
Onamia	CM	VCALL10
Parkers Prairie	CM	VCALL10
Schumacher	CM	VCALL10
Sebeka	CM	VCALL10
St. Cloud	CM	VCALL10
Wheaton	CM	VCALL10
Zimmerman	CM	VCALL10
Alden	SE	VCALL10
Alma	SE	VCALL10
Amherst	SE	VCALL10
Caledonia	SE	VCALL10
Cannon Falls	SE	VCALL10
Dodge Center	SE	VCALL10
Dresbach	SE	VCALL10
Elkton	SE	VCALL10
Lonsdale	SE	VCALL10
Oakland Woods	SE	VCALL10
Owatonna	SE	VCALL10
Red Wing	SE	VCALL10
Viola	SE	VCALL10
Wilson	SE	VCALL10

Interop Site	RAC	Hailing Channel
Arrowhead	NE	VCALL10
Baxter	NE	VCALL10
Border	NE	MNCOMM
Cass Lake	NE	VCALL10
Deer River	NE	VCALL10
Duluth	NE	VCALL10
Effie	NE	MNCOMM
Ely	NE	MNCOMM
Emily	NE	VCALL10
Gheen Hill	NE	MNCOMM
Grand Portage	NE	MNCOMM
Gunflint East	NE	MNCOMM
Kabetogama	NE	MNCOMM
Lawler	NE	VCALL10
Leader	NE	VCALL10
Little Fork	NE	MNCOMM
Maple Hill	NE	MNCOMM
Margie	NE	MNCOMM
Nashwauk(County Tower)	NE	VCALL10
Nickerson	NE	VCALL10
Northome	NE	MNCOMM
Pine City	NE	VCALL10
Quadna	NE	VCALL10
Schroder	NE	MNCOMM
Shaw	NE	VCALL10
Soudan	NE	*PENDING*
Tofte	NE	MNCOMM
Virginia	NE	VCALL10
Wales	NE	MNCOMM
Whyte	NE	MNCOMM
Woodland	NE	VCALL10
Ada	NW	VCALL10
Bagley	NW	VCALL10
Bemidji	NW	VCALL10
Crookston	NW	VCALL10
Dorothy	NW	VCALL10
Greenbush	NW	VCALL10
Hawley	NW	VCALL10
Lake Bronson	NW	VCALL10

Interop Site	RAC	Hailing Channel
Mahnomen	NW	VCALL10
Mantrap	NW	VCALL10
Mentor	NW	VCALL10
Middle River	NW	VCALL10
Northcote	NW	VCALL10
Roosevelt	NW	MNCOMM
Thorhult	NW	VCALL10
Warren	NW	VCALL10
Waskish	NW	MNCOMM
Winter Silo	NW	VCALL10
Wolf Lake	NW	VCALL10
Biscay	SC	VCALL10
Blue Earth	SC	VCALL10
Gaylord	SC	VCALL10
Janesville	SC	VCALL10
La Salle	SC	VCALL10
Mankato KMSU	SC	VCALL10
Nicollet	SC	VCALL10
Sherburn	SC	VCALL10
Brewster	SW	VCALL10
Canby	SW	*PENDING*
Chandler	SW	VCALL10
Danube	SW	VCALL10
Granite Falls	SW	VCALL10
Hardwick	SW	VCALL10
Lake Benton	SW	*PENDING*
Madison	SW	VCALL10
Morton	SW	VCALL10
Rushmore	SW	VCALL10
Russel	SW	VCALL10
Tracy	SW	VCALL10
Wanda	SW	VCALL10
Windom	SW	VCALL10
Woods	SW	VCALL10

Appendix G – 8CALL90/8TAC9X Sites and Naming Conventions

Interop Site	RAC	Gold Elite Name	MCC 7500 Name	Motobridge™ Name
Enfield	CM	CM-8CALL90-Enf	CM-8CALL90-Enfie	CM-8CALL90-Enfield
Enfield	CM	CM-8TAC9X-Enfi	CM-8TAC9X-Enfiel	CM-8TAC9X-Enfield
St Cloud	CM	CM-8CALL90-St	CM-8CALL90-St Cl	CM-8CALL90-St Cloud
St Cloud	CM	CM-8TAC9X-St C	CM-8TAC9X-St Clo	CM-8TAC9X-St Cloud
Duluth	NE	NE-8CALL90-Dul	NE-8CALL90-Dulut	NE-8CALL90-Duluth
Duluth	NE	NE-8TAC9X-Dulu	NE-8TAC9X-Duluth	NE-8TAC9X-Duluth
Moorhead	NW	NW-8CALL90-Moo	NW-8CALL90-Moorh	NW-8CALL90-Moorhead
Moorhead	NW	NW-8TAC9X-Moor	NW-8TAC9X-Moorhe	NW-8TAC9X-Moorhead
Mankato DOT	SC	SC-8CALL90-Man	SC-8CALL90-Manka	SC-8CALL90-Mankato
Mankato DOT	SC	SC-8TAC9X-Mank	SC-8TAC9X-Mankat	SC-8TAC9X-Mankato D
Red Wing	SE	SE-8CALL90-Red	SE-8CALL90-Red W	SE-8CALL90-Red Wing
Red Wing	SE	SE-8TAC9X-Red	SE-8TAC9X-Red Wi	SE-8TAC9X-Red Wing
Wilson	SE	SE-8CALL90-Wil	SE-8CALL90-Wilso	SE-8CALL90-Wilson
Wilson	SE	SE-8TAC9X-Wils	SE-8TAC9X-Wilson	SE-8TAC9X-Wilson

Appendix H – 8CALL90/8TAC9X Operations Guide

The Interop System 800 MHz national mutual aid stations primarily provide interoperability with an 800 MHz radio system user that cannot access ARMER trunked system resources. These stations could also provide a separate radio channel, outside of ARMER, for use on a specific incident. System Links to the Interop System 8CALL90 resources in specific areas (see Appendix G) are available to local ARMER system consoles (Motorola Gold Elite or MCC7500) in those counties where sufficient console resources are available to do so. An 800 MHz user moving into these specific areas would hail the local dispatcher on 8CALL90.

A local dispatcher with a Motobridge™ dispatch position or an ARMER system console, as well as access to the 8TAC9X station in their area, may also select one of the national 800 MHz tactical channels, 8TAC91-8TAC94, for use during an incident or operation. Dispatchers can select these channels on an 8TAC9X station and use them for specific interagency communications as part of an incident communications plan. The local dispatcher may patch one of these channels to an ARMER talkgroup according to applicable ARMER protocols and standards.

Figure H.1 provides a high-level overview of the 8CALL90/8TAC9X station configuration.

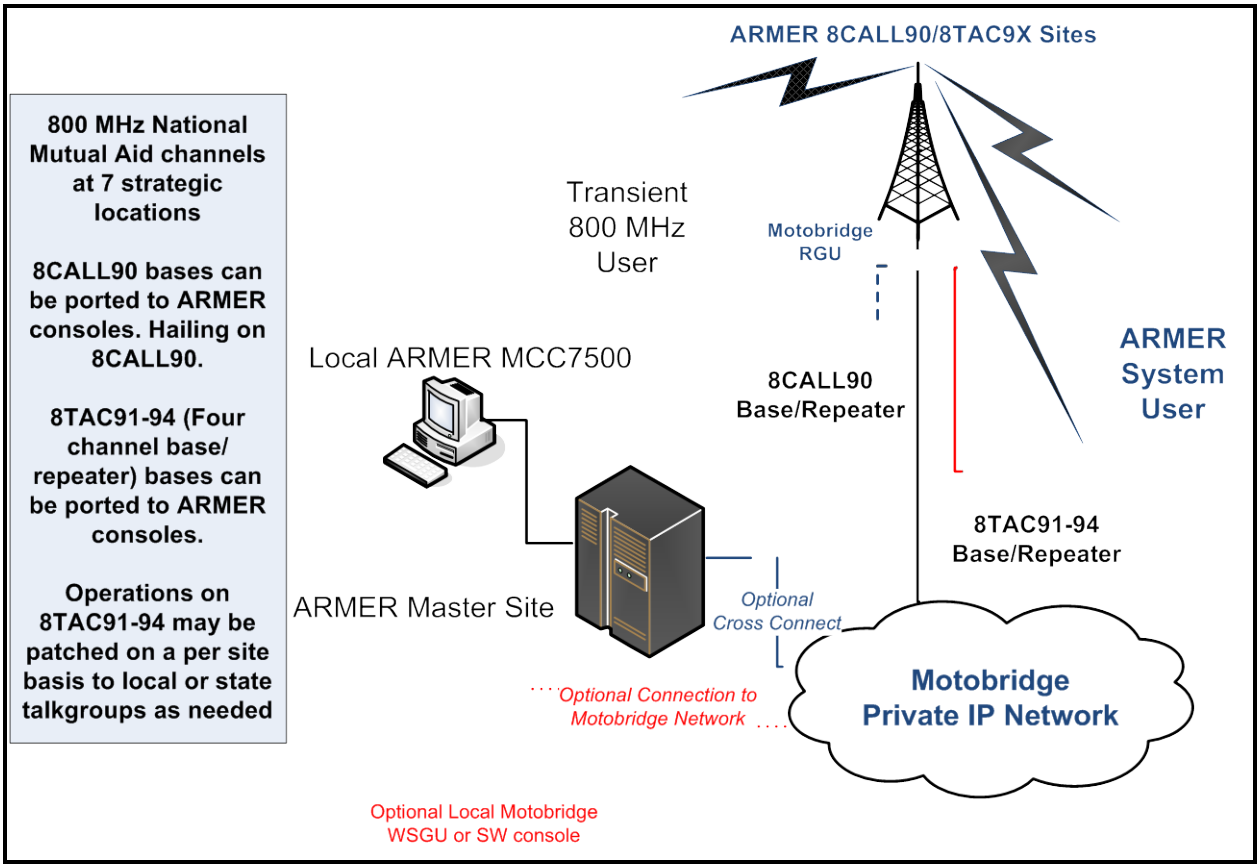

Figure H.1 – Interop System 8CALL90/8TAC9X Stations

Based on ARMER standards, the Region 22 Plan for use of 800 MHz public safety channels, as well as procedures outlined in the National Incident Management System (NIMS) and Incident Management System (IMS), all users on the 800 MHz national interoperability channels shall utilize certain operational policies and conventions.

1. Users shall use plain language at all times.
2. Users should initially identify themselves in the following manner: agency name, followed by service branch or function designation, followed by call sign or unit number; such as "North EMS 512", "Elk River Police 512", "Stearns County Public Works 512", "State Patrol 512".
3. Users hailing a dispatch center outside their normal operational area should also identify the dispatch center or agency they are attempting to communicate with, such as “State Patrol”, “Lake County SO”, “Elk River PD”.

4. Users should also indicate the resource they are hailing on, such as “8CALL90”.
5. A dispatcher may patch only one 8TAC9X channel in an area to one ARMER talkgroup per incident.
6. All participating entities shall use the ARMER System StatusBoard Application to track the use of 8TAC9X channels ARMER talkgroup resources to maximize the visibility of the use of such resources.
7. The setup and break down of patches are the responsibility of the dispatch center controlling the incident or event. Dispatchers should break down patches between 8TAC9X and ARMER talkgroups as soon as practical after the incident ends or migrates to another jurisdiction.

There are several potential operational scenarios where use of the 8CALL90 and 8TAC9X resources may be appropriate. The following are some sample scenarios.

800 MHz conventional radio user operating in an area with access to the 8CALL90 /8TAC9X stations:

1. The 800 MHz conventional radio user moves into a region with 8CALL90 /8TAC9X stations.
2. The 800 MHz conventional radio user would hail the appropriate agency on 8CALL90 and request assistance or instructions.
   a. Examples: 800 MHz conventional user hails on 8CALL90

      Hailing user: “Iowa DOC 12, Goodhue County on 8CALL90”
3. The hailed dispatch center would respond to the 800 MHz conventional radio user and determine the nature of the incident or request for assistance. The hailed dispatch center would also determine which radio resources are necessary and patch those resources to an ARMER talkgroup if needed. If an ARMER Interoperability Pool Talkgroup or Interop System 8TAC9X channel is to be used during an incident, the local dispatcher should reserve this resource on the ARMER System StatusBoard Application.
   a. Examples: Hailed dispatch center advises unit to proceed with communications on the assigned local 8TAC9X channel. This may be sufficient if the incident operations are solely using the direct side of the one of the 8TAC9X channels, in which case a patch to ARMER may not be necessary.

Hailed dispatcher: “Goodhue County, Iowa DOC 12, contact Incident Command on 8TAC91”

Hailing user: “Iowa DOC 12, Goodhue County, copy, switching to 8TAC91”

b. If a patch is necessary, the hailed dispatch center selects the appropriate 8TAC9X channel, activates the repeater on that channel, patches the selected channel to an ARMER talkgroup, and advises units to proceed with communications.

Hailed Dispatcher: “Goodhue County, Goodhue Incident Command, 8TAC91 patched to Goodhue Event 1 for incoming responder IOWA DOC 12”

Local Unit: “Goodhue Incident Command, Copy”

Hailed Dispatcher: “Goodhue County, Iowa DOC 12, go to 8TAC91 for incident command, you are patched to Goodhue Event 1.”

Hailing unit: “Iowa DOC 12, Goodhue County, copy, selecting 8TAC91 for incident command”

Hailing unit: “Iowa DOC 12, Goodhue Incident Command”

Local Unit: “Goodhue Incident Command, Iowa DOC 12, proceed to command post for further instructions.”

Hailing unit: “Iowa DOC, copy, proceeding to command post”

4. Upon termination of the incident, the hailed dispatch center breaks down the patch, notifies users, and disables repeat mode on 8TAC9X station.

Dispatcher: “Goodhue County, Iowa DOC 12, Goodhue Incident Command, patch of 8TAC91 to Goodhue Event 1 terminated”

Hailing unit: “Iowa DOC 12, copy, returning to 8CALL90”

Local unit: “Goodhue Incident Command, copy”

5. Once an incident using an ARMER Interoperability Pool Talkgroup or Interop System 8TAC9X channel ends, the local dispatcher should also release this resource on the ARMER System StatusBoard Application.

Appendix I – VHF Interoperability Channel Cross Reference

STD Name	Short Name	Mobile TX Freq	Mobile RX	TX/RX Mobile CTCSS[4]	Original Name	TX/RX Base CTCSS[5]
VCALL10	VCAL10	155.7525	155.7525	156.7/CSQ		156.7/156.7
VTAC11	VTAC11	151.1375	151.1375	156.7/CSQ		156.7/156.7
VTAC12	VTAC12	154.4525	154.4525	156.7/CSQ		156.7/156.7
VTAC13	VTAC13	158.7375	158.7375	156.7/CSQ		156.7/156.7
VTAC14	VTAC14	159.4725	159.4725	156.7/CSQ		156.7/156.7
MNCOMM	MNCOMM	155.3700	155.3700	156.7/156.7	MIMS	156.7/156.7
VFIRE23	VFIR23	154.2950	154.2950	156.7/156.7	SWFIREMA	156.7/156.7
VLAW31	VLAW31	155.4750	155.4750	156.7/156.7	MINSEF	156.7/156.7
VMED28	VMED28	155.3400	155.3400	156.7/156.7	EMS HEAR	156.7/156.7

[4] CTCSS or NAC for subscriber radios. For VCALL10, VTAC11, VTAC12, VTAC13, and VTAC14, use receive CTCSS of 156.7 if needed to mitigate interference.
[5] CTCSS or NAC for fixed stations.