

## **Allied Radio Matrix for Emergency Response (ARMER) Standards, Protocols, Procedures**

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Standard Title	<b>Satellite Enabled ARMER Base Radio Site</b>	
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### **1. Purpose or Objective**

The purpose of this standard is to establish policy and procedures for the deployment and use of the following Strategic Technology Reserve (STR) component:

STR satellite-enabled ARMER base radio site (SAT-COW)

### **2. Technical Background**

#### **▪ Capabilities**

There are two categories of ARMER trunked infrastructure that can be temporarily deployed. One is a “Communications Site on Wheels” (COW), which consists of a self-contained, rapidly deployable mobile infrastructure site. The other is “reserve” fixed site equipment that can be transported and installed in an existing equipment shelter. Both these categories can be considered elements of the interoperable communications “Strategic Technology Reserve” (STR). Currently, the Minnesota Department of Transportation (MnDOT) owns a substantial quantity of reserve site equipment, and Hennepin County owns a COW. An ARMER temporary site can operate in either site trunking mode or in wide area mode, utilizing a T-1 connection to an ARMER Mobile Switching Office (MSO.)

A total of nine 800 MHz frequencies have been designated statewide for temporary trunking operations. Five of these frequencies are “turn back” channels previously used by Hennepin County for its legacy Mobile Data Terminal (MDT) system. These frequencies are clear channels statewide and were not previously available for the ARMER system, because they were “general category” conventional channels with a “frozen” service area. An additional four dual-use frequencies are available on a secondary, non-interference basis for temporary trunking operation. These four channels are primarily assigned for portable mutual aid repeaters and statewide scene of action (SOA) simplex operation: 8TAC92, 8TAC93, A-SOA-2 and P-SOA-2.

#### **▪ Constraints**

Other than the five Hennepin turn back channels and the four secondary dual-use channels, there are no clear frequencies available on a statewide basis for temporary trunking

operations. If any of the 800 MHz frequencies assigned for ARMER temporary trunking operation are utilized in permanent fixed infrastructure in Minnesota, it will compromise the usefulness and deployability of an ARMER COW in those locations, particularly for the purpose of providing supplemental ARMER capacity and coverage for an emergency response to a disaster-level incident.

The 700 MHz channels proposed by the National Public Safety Telecommunications Council (NPSTC) will not be practical for COW use in Minnesota for years, as there are several thousand 800 MHz only ARMER radios in service that will not be replaced for over five years. Additionally, the Hennepin County COW system consists of 800 MHz only base stations and would have to be replaced at substantial cost in order to switch to 700 MHz.

If not optimally configured (e.g., site trunking within the coverage area of a wide area site) the temporary site may cause communications problems for subscriber radios on the ARMER system. Multiple temporary sites cannot operate in the same geographic area on the same frequencies simultaneously.

### **3. Operational Context**

As a component of the Minnesota Strategic Technology Reserve, an ARMER temporary trunking site can be a critical tool to establish communications for disasters and major incidents involving a loss or lack of sufficient, permanent ARMER infrastructure. A temporary site has three primary mission categories:

- (1) To provide supplemental capacity and coverage within the fixed ARMER network to support a major emergency incident or pre-planned event, e.g., large wildland fire, major flooding, tornado, Weapons of Mass Destruction (WMD) terrorist attack, political convention, large professional sports event, etc.
- (2) To extend the ARMER network beyond the ARMER service area anywhere in North America to support Minnesota ARMER first responders who have deployed on mutual aid, e.g., Hurricane Katrina, Iowa floods, etc.
- (3) To function as a backup in the event of an ARMER site failure

For a large-scale emergency incident, it is important for a COW to be deployable and operational without delay upon arrival at the incident scene to establish/restore/augment ARMER communications. The Tactical Interoperable Communications Plan (TICP) generally requires a deployment time for field deployed resources to be one hour. For an emergency incident deployment, reconfiguring frequencies in a COW system or operating it with reduced capacity due to frequency conflicts should be avoided to the extent possible.

### **4. Standardized Policy**

800 MHz turn back channels 239, 255, 331, 351, and 391 are not included in the frequency plan for construction of the ARMER backbone and are assigned on a shared,

statewide basis for temporary trunking operation. These channels will also be held in reserve on a statewide basis for future capacity enhancements to the ARMER system by local agencies. Local capacity enhancements may use these channels only if no other suitable channels are available (last resort assignment.) Any request to use these channels for permanent fixed infrastructure must be approved by the Statewide Emergency Communications (SECB).

8TAC92, 8TAC93, A-SOA-2 and P-SOA-2 may be also used on a secondary, non-interference basis for temporary trunking operation for incidents requiring more than five channels of temporary capacity. However, because of the potential for interference to conventional mutual aid and SOA channels, no ARMER temporary site should be deployed on these frequencies unless the use of 8TAC92, 8TAC93, A-SOA-2, and P-SOA-2 is carefully coordinated with local and adjoining users. 8TAC92, 8TAC93, A-SOA-2, and P-SOA-2 should be designated in the Incident Communications Plan (ICS-205) as unavailable for conventional use in the incident and immediately adjoining areas when an ARMER temporary site system is deployed. The remaining seven statewide/nationwide conventional 8CALL/8TAC and SOA channels should be assigned for conventional operation as needed for the incident.

Any future COW systems should be purchased with base stations and antenna combiners capable of both 700 MHz and 800 MHz band operation to facilitate transition to 700 MHz operation in the future. Operation of a temporary site in border areas or outside Minnesota may require frequency coordination that could result in changing some of the operating frequencies. COW units should be equipped with auto tune transmitter combiners to facilitate frequency changes if necessary.

An ARMER temporary site should not be set up in site trunking mode if any of the subscribers using the temporary site have the potential to receive coverage from an ARMER wide area site. T-1 connections between the temporary site and the MSO may be via ARMER microwave, leased T-1, or space satellite T-1. T-1s utilizing facilities other than ARMER microwave backhaul must be encrypted.

An agency operating an ARMER temporary site shall have staff members with a level of competence sufficient to successfully maintain, deploy, and operate the temporary site without interference to the ARMER system. Existing training and pertinent ARMER standards will be followed.

## **5. Standardized Procedure**

Agencies hosting an ARMER temporary site should provide the Minnesota State Duty Officer (MDO) with a point of contact to be used by the state upon request to dispatch an ARMER temporary site. The point of contact should also notify the MDO whenever it deploys the ARMER temporary site or any time it is out of service for maintenance.

Prior to and during deployment, an ARMER temporary site Subsystem Administrator will coordinate deployment and configuration of the site with the Statewide System

Administrator and any impacted local System Administrator. This will include any necessary frequency changes, the system Adjacent Control Channel list "ACC," and talkgroup site access profile settings to support required operations of the temporary site, based on specific incident needs.

At a minimum, an announcement will be made on the SYS-TECH talkgroup prior to activation of the temporary site once it becomes operational. An additional announcement will be made prior to terminating temporary site operations.

Detailed ARMER temporary site voice and data capabilities, contact point information, activation procedures, and other relevant information should be kept current and be included in the Statewide TIC Plan.

Each ARMER temporary site should be fully tested bi-annually, including connecting to the MSO via the satellite link to ensure operational readiness.

## **6. Management**

The agency owning and operating each ARMER temporary site is considered an ARMER Subsystem Owner. The Subsystem Owner is responsible for management of its transportable facility, which should be consistent with the applicable Cooperative Agreement.