



Alaska Land Mobile Radio Communications System

System Backup and Recovery Procedure 400-5

Version 12

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Developed in conjunction with:



Bering Straits Information Technology, LLC
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Document Revision History

| Name | Date | Reason for Changes | Version |
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| Coates, Michael | 12/22/2008 | Approved by the User Council – Final. | 2 |
| Shafer, Sherry | 3/1/2010 | Annual review/update. Approved by the User Council – Final. | 3 |
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Acronyms and Definitions

Alaska Federal Executive Association (AFEA): federal government entities, agencies and organizations, other than the Department of Defense, that will operate on the shared ALMR system infrastructure.

Alaska Land Mobile Radio (ALMR) Communications System: the ALMR Communications System, which uses but is separate from the State of Alaska Telecommunications System (SATS), as established in the Cooperative and Mutual Aid Agreement.

Alaska Municipal League: a voluntary non-profit organization in Alaska that represents member local governments.

Cooperative and Mutual Agreement: the instrument that establishes ALMR and sets out the terms and conditions by which the system will be governed, managed, operated and modified by the Parties signing the Cooperative and Mutual Aid Agreement.

Department of Administration (DOA): a State of Alaska (SOA) department that maintains the SOA Telecommunication System (SATS) and provides information technology (IT) and communications technical support to state agencies.

Department of Defense – Alaska: Alaskan Command, US Air Force and US Army component services operating under United States Pacific Command and United States Northern Command.

DODI: Department of Defense Instruction

Executive Council: made up of three voting members and two associate members representing the original four constituency groups: the State of Alaska, the Department of Defense, Federal Non-DOD agencies (represented by the Alaska Federal Executive Association), and local municipal/government (represented by the Alaska Municipal League and the Municipality of Anchorage).

FV: FullVision® INM Database Server

Cybersecurity/Information Assurance (IA): information operations that protect and defend information and information systems by ensuring their availability, integrity, authentication, confidentiality, and non-repudiation. This includes providing for restoration of information systems by incorporating protection, detection, and reaction capabilities.

Key Management Facility (KMF): allows for secure re-keying of radios over the air.

Member: a public safety agency including, but not limited to, a general government agency (local, state or federal), its authorized employees and personnel (paid or



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volunteer), and its service provider, participating in and using the System under a Membership Agreement.

Municipality of Anchorage (MOA): the MOA covers 1,951 square miles with a population of over 300,000. The MOA stretches from Portage, at the southern border, to the Knik River at the northern border, and encompasses the communities of Girdwood, Indian, Anchorage, Eagle River, Chugiak/Birchwood, and the native village of Eklutna.

Operations Management Office (OMO): develops recommendations for policies, procedures, and guidelines; identifies technologies and standards; and coordinates intergovernmental resources to facilitate communications interoperability with emphasis on improving public safety and emergency response communications.

State of Alaska (SOA): the primary maintainer of the SATS (the State's microwave system), and shared owner of the System.

State of Alaska Telecommunications Systems (SATS): the State of Alaska statewide telecommunications system microwave network.

System Management Office (SMO): the team of specialists responsible for management of maintenance and operations of the System.

SSS: System Statistics Server

User: an agency, person, group, organization or other entity which has an existing written Membership Agreement to operate on ALMR with one of the Parties to the Cooperative and Mutual Aid Agreement. The terms user and member are synonymous and interchangeable.

User Council: responsible for recommending all operational and maintenance decisions affecting the System. Under the direction and supervision of the Executive Council, the User Council has the responsibility for management oversight and operations of the System. The User Council oversees the development of System operations plans, procedures and policies under the direction and guidance of the Executive Council.

UCS: User Configuration Server

ZDS: Zone Database Server

ZSS: Zone Statistics Server

1.0 Purpose

This procedure defines required actions to be taken by System Management Office and Operations Management Office personnel for performing any required System backup and recovery operations.

This procedure meets or surpasses the minimum accepted level of preparedness for backup and recovery for Alaska Land Mobile Radio (ALMR) systems in the form of technical, operational and managerial control as required under NIST SP800-53r4, *Recommended Security Controls for Federal Information Systems*.

2.0 Roles and Responsibilities

2.1 Executive Council

The Executive Council (EC) shall be responsible for the management and enforcement of sanctions when violations of the System Backup and Recovery Procedure warrant such action.

2.2 User Council

The User Council (UC) shall be responsible for:

- Formal approval of the System Backup and Recovery Procedure, and any substantial revisions hereafter
- Reviewing all notices of violations and the recommended actions, in the form of sanctions to be implemented, as provided by the Information Systems Security Manager, prior to submittal to the EC

2.3 Operations Management Office

The Operations Management Office (OMO) is responsible for:

- Briefing the UC and the EC of violations pertaining to System backup and recovery, when notified by the ISSM
- Verifying and documenting backups are being completed (daily, weekly or as needed)
- Verifying and documenting the operating system media and other critical software is stored, as required
- Verifying a master list of ALMR hardware and software components exists and is stored, as required
- Ensuring backup and recovery procedures are tested annually, and advising the UC and EC of the results

2.4 System Management Office

The System Management Office (SMO) shall coordinate and oversee all backup and recovery operations. This includes, but is not limited to:

- Maintenance and backup of an ALMR hardware asset baseline
- Access control and storage of all ALMR backup media
- Scheduling and performance of critical System backups
- Coordination of recovery efforts during a System disaster or incident
- Training of all personnel responsible for backup and recovery procedures

2.5 Information Systems Security Manager

The Information System Security Manager (ISSM) shall be responsible for:

- Developing, disseminating and periodically reviewing/updating formal documented procedures that address the purpose, scope, roles and responsibilities and compliance with System backup and recovery
- Facilitating the implementation of the backup and recovery procedures, if/when required
- Managing reported issues identified under the scope of the System Backup and Recovery Procedure
- Reporting violations to the OMO
- Documenting any actions to be taken in the form of a sanction and forwarding those actions, through the OMO, to the UC for review and to the EC for approval

3.0 System Baselines

The SMO will maintain a compiled list of all ALMR hardware and software components. Motorola® provides this list as a service whenever a major change is made to the System. The list provided by Motorola® will be used as the basis for System recovery prioritization, as discussed later in this document (para 7.3). A backup copy of this inventory shall be stored in a fire-rated container and not located on site with the original list.

The baseline will include the following items regarding each piece of hardware:

- Manufacturer
- Type
- Model
- Physical location
- Network topology/architecture

The baseline will include the following items regarding each piece of software:

- Manufacturer
- Type
- Version
- Software license number(s)
- User manuals
- Procedures

The SMO will be responsible for ensuring that new/upgraded hardware or software added to the ALMR System is documented within the baseline and a new backup copy of the list is produced and stored, accordingly.

4.0 Backup Requirements

Backup operations will be implemented in a way as to minimize impact on the network and System resources.

4.1 Daily Backups

Backups are performed daily using an incremental process that is scheduled in the Backup Server (Bar Server 01) and used as the main backup library. On the first workday of the week, all backup data is manually moved via the BAR Server to the “offsite” Network Attached Storage (NAS). These devices are configured at system development to automatically perform incremental backups daily and are no longer managed by technicians. The following device backups are moved in each Zone.

- Domain Controller
- Network Management (NM) General Purpose Server - UCS
- NMC02
- NM General Purpose Server - ZSS01 (Zone Statistical Server)
- NM General Purpose Server - UEM01
- Core Security Management Server
- NM General Purpose Server - ZDS01 (Zone Database Server)
- Air Traffic Router (ATR)
- Bar Server 01
- NMC01
- Zone Controller 1
- Log01
- Packet Data Gateway Router - PDR01
- NM General Purpose Server - UCS-UNC01
- MOSCAD - MOSSVR1
- NM General Purpose Server - UCS-Statistical Server
- Sys Domain Controller

- MOSCAD - MOSCLI1
- Zone Controller 2

4.2 Weekly Backups

4.2.1 A backup of all dispatch console configuration files shall be performed weekly.

4.2.2 A backup of all ALMR controlled Key Management Facility (KMF) server databases shall be performed at least weekly.

4.2.3 A backup of the Trackit® and SharePoint server(s) shall be performed at least weekly.

4.3 As-Needed Backups

All network device configurations shall be backed up before and after System changes. This includes, but is not limited to, domain controllers, routers, firewalls and switch configurations.

4.3.1 System Change/Update Backup

A System backup, to include System status data, will be created before any major System changes are enacted or before any System updates are performed. The backup will be retained in the designated offsite location for at least five working days after the changes.

After changes have been completed, and a successful reboot has been accomplished, the regular backup schedule shall be resumed.

4.3.2 Weekend and Holiday Procedures

System data and logs are backed up to the NAS, where it is kept for the appropriate length of time.

Security event logs are maintained for a year. The two Zones act as mirrored sites for each other. In the event of a catastrophic failure, the other Master site can be configured to handle the traffic from the failed Master site, and can also be used to recreate the failed Master site. Therefore, there is no longer a need to swap out writable media during weekends and holidays.

Administrators will now receive automated email notices when backups are completed successfully and will check the integrity of backup files to ensure that they contain all the relevant System and user data.

5.0 Media Labeling

Files on the backup server are labeled electronically with the appropriate data to allow the content to be quickly found.

6.0 Backup Storage

Back-up copies of the original media of the operating system and other critical software shall be stored in a fire-rated container and not located on site with the original operational software.

This material will be stored within a secure area that is restricted to authorized individuals only.

6.1 Designated Storage Locations

The following designated storage location(s) are approved for all System backup media.

| ALMR System Location | Backup Media Storage Location |
|--|--|
| Zone 1 Master Site 5900 E Tudor Rd Anchorage, AK 99507 | 5700 E Tudor Road Anchorage, AK 99507 |
| Zone 2 Master Site Building 1192 Birch Hill, Fort Wainwright 99703 | 911 Cushman Street. Fairbanks, AK 99701 |
| TrackIt® Server/SharePoint Server 5900 E Tudor Rd Anchorage, Alaska 99507 | 5700 E Tudor Road Anchorage, AK 99507 |

Table 6-1. Designated Storage Locations

6.2 Transfer to Off-Site Storage

Backup data is transferred to designated storage locations on a weekly basis.

7.0 Recovery Procedures

7.1 Recovery Documentation and Procedures

All backup and recovery operations shall follow the documented procedure, which is specific to the backup software used and tailored to the data that is being backed up.

7.2 Secure Recovery

7.2.1 The hardware and software used by ALMR personnel for backup and recovery of the ALMR System shall be protected from unauthorized access or modification with the same diligence that is applied to the ALMR System itself.

7.2.2 If appropriately cleared personnel, as defined by the ISSM, are unavailable to perform maintenance or repair, personnel with a lesser clearance may be used. For the duration of the recovery/repair, maintenance personnel shall be escorted and monitored by approved ALMR personnel, as defined by the ISSM.

7.2.3 If at any point during the resumption of the System, a situation is encountered which could inhibit a trusted recovery, ALMR personnel will cease resumption activities, document the situation and consult with the ISSM. It is the responsibility of the ISSM to determine the appropriate mitigating procedures necessary to enable a trusted recovery of the System. The ISSM shall maintain the original documented information of the incident and provide a copy to the Operations Manager.

7.3 Prioritization of Recovery

In the event that recovery is required on multiple systems, priority groups have been established to guide the recovery of the systems. Systems in Priority Group 1 should be recovered first, and then Priority Group 2 next and continuing until all systems are restored.

A current prioritized System recovery list can be found at Attachment 1, Restoration Priority Worksheet.

7.4 Required Recovery Personnel

The SMO will be available to respond (24/7) upon System failure notification and shall coordinate emergency maintenance support for key information technology assets.

8.0 Backup and Recovery Procedure Testing

Backup and Recovery procedures for the ALMR System shall be tested annually by the SMO, and all results of the test shall be recorded and provided to the Operations Manager.

9.0 Training and Awareness

All personnel responsible for recovery of the ALMR System shall receive appropriate training specific to their roles in the backup and recovery processes.



10.0 Compliance

Compliance with the System Backup and Recovery Procedure is outlined in ALMR System Backup and Recovery Policy Memorandum 400-5.



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**Attachment 1
Restoration Priority Worksheet**

| Element | Restoration Priority Group | Zone or Site |
|--|----------------------------|--------------|
| Air Traffic Router - Virtualized | 1 | Zone |
| Alerting Master Computer | | |
| Backup and Recovery Server - Virtualized | | Zone |
| Border Gateway | 2 | Zone |
| CCGW | | |
| Centracom Gold Elite ADM/CDM Server | 1 | Zone |
| Centracom Gold Elite Dispatch Console | | Site |
| Centralized Event Logging Server - (SYSLOG Server) - Virtualized | | Zone |
| Core Backhaul LAN Switch- 2620-24 | | |
| Core LAN Switch-3800 | 1 | Zone |
| Core Router | 1 | Zone |
| Core Security Management Server (CSMS) - Virtualized | 1 | Zone |
| Corporate WAN Router (CWR) (patch/ relay panel) | | Zone |
| DAS_01 | | |
| DMZ LAN Switch-2610 | | |
| DMZ LAN Switch-2620 | | |
| DMZ LAN Switch-2626 | | |
| Domain Controller - Virtualized | 1 | Zone |
| Exit Router | 1 | Zone |
| Fan-out LAN Switch-2610 | | |
| Fan-out LAN Switch-2620 | | |
| Fan-out LAN Switch-2626 | | |
| Firewall Management Server - Virtualized | 2 | Zone |
| FSA4000 FEP | | |
| FSA4000 RTU | | |
| Gateway Router | 1 | Zone |
| GGSN Router | 3 | Zone |
| GPB 8000 Reference Distribution Module (RDM) | | |
| Graphical Master Computer - Virtualized | | Zone |
| Graphical Workstation | | |
| IDS LAN Switch-2620 | | |
| IP PBX Server | 4 | Zone |
| IP Simulcast Remote Site Gateway | | |
| IV&D LAN Switch-2610 | | |
| IV&D LAN Switch-2620 | | |
| IV&D LAN Switch-2626 | | |
| IV&D Router | | |
| Juniper Firewall ISG1000 | 2 | Zone |
| Juniper Firewall SSG140 | 2 | Zone |
| KMF Client | | |
| KMF CryptR | | |
| KMF Server | | |
| KVL 4000 | | |
| MCC 7500 Aux I/O Server | | |
| MCC7100 IP Console | | |
| MCC7500 Archiving Interface Server (AIS) | | |
| MCC7500 Dispatch Console | | |
| Media Gateway | | |
| Mediation LAN Switch-2620 | | |
| Motorola Gold Elite Gateway (MGEG) | 1 | Zone |
| MRV Terminal Server LX4008t | | |
| MRV Terminal Server LX4048t | | |
| Network Time Server | | |
| NICE IP Logger | | |
| NICE Replay Workstation | | |
| NM Client - Standalone | 5 | Zone |
| NM-Dispatch Router | 5 | Zone |



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Restoration Priority Worksheet (continued)

| Element | Restoration Priority Group | Zone or Site |
|--|----------------------------------|--------------------|
| NM-Disp-Conv LAN Switch-2620 | 5 | Zone |
| NM-Disp-Conv LAN Switch-2626 | 5 | Zone |
| Packet Data Gateway - IVD - Virtualized | | Zone |
| Peripheral Network Gateway | | |
| PN Router | 2 | Zone |
| PN Server | 2 | Zone |
| Prime Site Router (IP Simulcast Prime Site Router) | | |
| Raymar Modem (model TEL-6209548200010) | | |
| Remote Simul Router | | |
| Remote Site - GCP 8000 - Site Controller (CommonSC) | | Site |
| Remote Site - PSC9600 - Site Controller (PSC) | | Site |
| Remote Site 700 - GTR 8000 - Site Repeater (SR) | | Site |
| Remote Site Access Gateway (Ethernet Links only) | | Site |
| Remote Site VHF - GTR 8000 - Site Repeater (SR) | | Site |
| Remote Site VHF - Quantar - Site Repeater (SR) | | Site |
| SDM3000 Network Translator | | |
| SDM3000 RTU | | |
| Simul Backhaul LAN Switch-2610 | | |
| Simul Backhaul LAN Switch-2620 | | |
| Simul Backhaul LAN Switch-2626 | | |
| Simul Prime LAN Switch-2610 | | |
| Simul Prime LAN Switch-2620 | | |
| Simul Prime LAN Switch-2650 | | |
| Simul Remote LAN Switch-2610 | | |
| Simul Remote LAN Switch-2620 | | |
| Simul Remote LAN Switch-2626 | | |
| Simulcast - ASTROTAC9600 - Comparator | | |
| Simulcast - GCM 8000 - Comparator | | |
| Simulcast - GCP 8000 - Site Controller (SSC) | | |
| Simulcast 700 - GTR 8000 - MultiSite Base Radio (MSBR) | 1 | Site |
| Simulcast UHF - Quantar - MultiSite Base Radio (MSBR) | 1 | Site |
| Simulcast VHF - GTR 8000 - MultiSite Base Radio (MSBR) | 1 | Site |
| Simulcast VHF - Quantar - MultiSite Base Radio (MSBR) | 1 | Site |
| Site Gateway | 1 | Site |
| Site Gateway (Console Site) | 1 | Site |
| Site Gateway (Conventional Channel Interface) | 1 | Site |
| Site Gateway (IP Simulcast Prime Site) | 1 | Site |
| System Statistical Server - Virtualized | 1 | Zone |
| Telephone Media Gateway (TMG) | 4 | Zone |
| TeNSr Channel Bank Model 600 | 1 | Site |
| TeNSr Channel Bank Model 800 | 1 | Site |
| Unified Event Manager - Virtualized | 1 | Zone |
| Unified Network Configurator - Virtualized | 1 | Zone |
| User Configuration Server - Virtualized | 1 | Zone |
| Virtual Server - DL 360 G6 | 1 | Zone |
| Virtual Server - VMS01 | 1 | Zone |
| Virtual Server - VMS02 | 1 | Zone |
| Virtual Server - VMS05 | 1 | Zone |
| Virtual Server -(ESX Server)- DL 360 | 1 | Zone |
| Vortex VPM | | |
| Z400 High Tier | | |
| Z400 Low Tier | | |
| Z400 Mid Tier | | |
| Z420 High Tier | | |
| Z420 Low Tier | | |
| Zone Controller - Virtualized | 1 | Zone |
| Zone Database Server - Virtualized | 1 | Zone |