ALASKA LAND MOBILE RADIO EXECUTIVE COUNCIL
(A Federal, State and Municipal Partnership)

MEMORANDUM FOR ALMR Executive Council **January 13, 2016**

FROM: DOD Co-Chair

SUBJECT: January 21, 2016, Meeting Agenda

TO: See Distribution

1. Call to Order. *Colonel Harold Hoang, Department of Defense (DOD) Co-Chair* will call the meeting to order. The roll will be taken.

2. Opening Statements and Other Announcements.

3. Approval of Previous Meeting Minutes. (Colonel Hoang) Review of the draft minutes from the November 2015 Executive Council meeting. (Atch 1)

The following motion is offered to the council for consideration.

> **Motion: Approve November 19, 2015, Executive Council meeting minutes, as presented.**

4. Old Business.

a. Service Level Agreement (SLA). At the November meeting, Mr. Del Smith stated the agreement had been signed and he would be pick it up next week.

b. Codicil to the Cooperative Agreement. Mr. Smith stated he was advised by the Department of Public Safety Commissioner that it was still in the Governor's office awaiting signature.

c. FY17 Contract Execution Actions. At the November meeting, Mr. Scott Stormo explained he would have to start a conversation with Deputy Commissioner Boucher to see how they will proceed since the budget had not been announced yet. He advised the group that the State's funding would probably be significantly less than what the Executive Council had approved.

Mr. Tim Woodall noted the DOD would have to know what their constraints are so the services could begin budgeting. He advised that until they got the contract bids, the DOD could not construct a contract.

d. FY16 Cost Share Cooperative Agreement. At the November meeting, Mr. Del Smith advised that the document was still pending a designated SOA signatory.

5. User Council Update. (Mr. Ocie Adams)

a. Annual election. Announcement of results.

b. Vacancies. Previous vacancies still exist for both the alternate Southeast-Municipalities position and the alternate US Army-Alaska (USARAK) position. **NOTE:** This item will remain **OPEN** on the agenda until resolution.

6. Operations Management Office. (Mr. Del Smith)

a. Clear site power issue
b. ALMR/AWARN interoperability
c. Soldotna Dispatch outage
d. December System metrics (Atch 2)

7. New Business.

8. Next Meeting. *(Colonel Hoang) The next meeting is scheduled for* February 18, 2016, 1:30 p.m. at the Enterprise Technology Services Conference Room, 5900 E Tudor Road.

9. Adjourn Meeting. (Colonel Hoang)

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Harold Hoang, Colonel, USAF
ALCOM/J6, Department of Defense
ALMR Executive Council

2 Attachments:
1. Draft November Meeting Minutes
2. December System Metrics

Distribution:
SOA/DPS, Deputy Commissioner Bill Comer
ALCOM/J6, Colonel Harold Hoang
FBI, ASAC David Condo
AML, Ms. Linda Murphy
MOA, Deputy Chief Ken Spadafora
SOA DOA, Mr. John Boucher
SOA ETS, Mr. Jim Bates
SOA ETS, Mr. Scott Stormo
ALCOM/J64, Mr. Timothy Woodall
MOA, Mr. Trygve Erickson
SOA DOT, Mr. Ocie Adams
OMO, Mr. Del Smith
ALCOM/J60, LTC Glenn Mellor

ALASKA LAND MOBILE RADIO EXECUTIVE COUNCIL
(A Federal, State and Municipal Partnership)

MEMORANDUM FOR ALMR Executive Council **December XX, 2015**

FROM: DOD Executive Co-Chair

SUBJECT: November 19, 2015, ALMR Executive Council Meeting Minutes

TO: See Distribution

Executive Council Members Present:

Colonel Harold Hoang	Department of Defense (DOD) – Alaskan Command (ALCOM)/J6
Assistant Special Agent in Charge David Condo	Alaska Federal Executive Association (AFEA)/Federal Bureau of Investigation (via teleconference)
Deputy Chief Ken Spadafora	Municipality of Anchorage – Anchorage Police Department

ALMR Support Team Members and Guests Present:

Mr. Ocie Adams	User Council Vice Chair
Mr. Del Smith	Operations Manager, ALMR
Mr. John Boucher	DOA Deputy Commissioner
Mr. Scott Stormo	ETS SATS/ALMR Manager
Mr. Tim Woodall	DOD ALMR Program Manager
Mr. Rich Leber	Technical Advisor, ALMR
Ms. Sherry Shafer	Operations Management Office (via teleconference)

1. Call to Order. Colonel Harold Hoang, Department of Defense (DOD) Co-Chair, called the meeting to order at 1:34 p.m.

2. Opening Statements and Other Announcements.

3. Approval of Previous Meeting Minutes. Colonel Hoang asked the Executive Council (EC) members if they had reviewed the October meeting minutes and had any comments.

Hearing no comments, Colonel Hoang offered a motion for their approval.

> **Motion: Approve the October 15 Executive Council meeting minutes, as presented.**

The motion was made by Assistant Special Agent in Charge (ASAC) David Condo and seconded by Colonel Hoang. There were no objections. **The motion was carried and approved.**

4. Old Business.

a. Service Level Agreement (SLA). Mr. Del Smith advised he just been on the phone with the Deputy Commissioner of Administration, Mr. John Boucher, answering some questions regarding the document. Del stated that Deputy Commissioner Boucher advised him it had been signed and it could be picked up next week.

b. Codicil to the Cooperative Agreement. Mr. Smith briefed as previously advised, Deputy Commissioner Vrabec had passed the document to Commissioner Folger. Del stated Commissioner Folger had called him last week to let him know it was still in the Governor's office for signature

Del advised that he would check on it again next week.

c. FY17 Contract Executions. Mr. Tim Woodall deferred to Mr. Scott Stormo to provide this week's update.

Mr. Stormo stated the new contracting officer had been going through the contracts and when he had last talked to him, the Operations Management Office (OMO) contract does not expire, but has an option for another term; however, the System Management Office (SMO) contract with Bering Straits was ending. Mr. Stormo noted that he would have to start a conversation with Deputy Commissioner Boucher to see how they will proceed.

Mr. Woodall asked Scott if he knew if an RFI was required or if it would go straight to the bid process.

Mr. Stormo stated he was not sure but in the past, Mr. Max McGrath had had sent out an RFI.

Mr. Woodall asked Scott if he knew the State's contract timeline and if the Department of Defense (DOD) would be required to put the contract funds upfront. He explained that the codicil was tied to the contracting process, therefore, it had to be signed first before any funds were allotted.

Colonel Hoang pointed out that an RFI could proceed before the codicil was signed.

Mr. Woodall briefed, that from a funds perspective, the DOD was locked at last year's contract price with a five percent inflation allowance. He noted the DOD would have to know what their constraints are so the services could begin budgeting.

Mr. Stormo asked about the System Upgrade Assistance (SUA) program and Mr. Woodall advised it would have to be added in the form of contract line item (CLIN) options, but it was difficult to know at this point if it would be added.

Mr. Woodall pointed out that if the DOD could get some advice by December, it would help and Colonel Hoang added that unless the services had time to provide their portion of the funding, there could be an issue with the contract execution.

Mr. Stormo advised the group that the State's funding was also significantly less than what the Executive Council had approved.

Mr. Woodall noted that until they got the contract bids, the DOD could not construct a contract. They would have to look at what needed to be listed as primary services and everything else would have to be options.

d. FY16 Cost Share Agreement. Mr. Smith advised that the document was still pending a designated SOA signatory and according to Commissioner Folger it would be Bill Comer once he took office as the Deputy Commissioner. Mr. Smith stated he would get this taken care of as soon as Comer was on board.

5. <u>User Council Update</u>.

a. Annual Elections. Mr. Ocie Adams, Vice Chair, advised the Executive Council stated that the User Council was currently in the process of voting with all ballots due on November 30 and the selectees would be announced at the December 2 User Council meeting.

b. User Council Vacancies. Mr. Adams stated the Federal Bureau of Investigation notified the OMO that they had appointed a new alternate, as Mr. Paul Arasz had transferred to the lower 48, and the Department of Public Safety was able to fill their alternate position, which has been empty for the past couple of years.
He offered the following motion is offered for their consideration.

> **Motion: Approve the appointment of Mr. David Brown, as the alternate Federal Bureau of Investigation representative, and the appointment of Mr. John Rockwell, as the alternate Department of Public Safety representative, to the ALMR User Council.**

ASAC Condo advised he had no problem with the appointments and offered the motion, as provided, and Colonel Hoang seconded the motion. There were no objections. **The motion was carried and approved.**

6. <u>Operations Management Office</u>.

a. Birch Hill Master Site Battery Plant. Mr. Smith briefed that the battery plant had been installed on November 17 – 18. He stated one half of the plant had a single cracked battery and replacement had been emergency ordered and should arrive next week. Mr.

Smith advised the council the battery plant could maintain the site for 60 minutes run time until the generator started, which should be well before the 60 minute timeframe.

b. Annual Membership Agreement Renewals. Mr. Smith stated both the USARAK and the JBER agreements had been received, with the help of Colonel Hoang, and this action was completed for this fiscal year.

c. Clear Site Power. Mr. Smith briefed that an estimate had been provided for moving the site to Kobe, as well as for running a new power supply to the existing site. He advised that the site had not been turned off, as previous advised but nothing would be done until the Clear personnel provided their final decision.

Mr. Woodall asked if the site was turned off if it affected anyone else.

Mr. Smith explained Anderson Volunteer Fire Department, the Alaska State Troopers (AST) and the Department of Transportation and Public Services would all be affected. He briefed the closest site would then be Nenana, which was over a hill and that when the site had previously been removed, there was degraded coverage in the entire area.

d. October System Metrics. Mr. Smith advised the voice calls were up by approximately 10K, but the busies were only up by 25. He explained this was to be expected at this time of year.

e. Shooting Incident in Anchorage. Mr. Smith briefed the council that there had been a recent shooting in Anchorage and the suspect fled to the Wasilla area. He stated AST, Anchorage Police Department (APD), Federal Bureau of Investigation, Joint Base Elmendorf-Richardson (JBER) Security Forces (SF) and the Alaska Railroad Police had all been involved in a coordinated apprehension effort. He explained he had spoken with many of the agencies involved and the communications was very good among all of them. The one thing he pointed out was that the dispatcher patched APD with AST rather than utilizing the preferred method of shared talkgroups in the Incident Command Zone.

Mr. Smith also mentioned that while he was currently out of state and in Washington and Idaho area, Spokane, Washington, had experienced a major wind storm with at least 157K people without power for 5 days or more and even Idaho had experienced a 20-hour outage. During the major part of the storm, all cellular services had been out. Mr. Smith pointed out these are the types of events, highlight the value of the ALMR System.

He stated he planned to follow up with public safety officials in Washington to see how their system worked throughout the storm and to write an article for the Insider newsletter.

Colonel Hoang noted this highlighted the positive impact for Alaska in having the ALMR System.

Deputy Chief Ken Spadafora advised the manhunt was the largest amount of agencies that APD had interoperable communications with for an event and it was the longest incident, as well. He stated that APD has an agreement in place with the JBER Communication Squadron to create an encrypted patch when they need it between APD

and the SF. Deputy Chief Spadafora pointed out that they train often for these types of incidents and all the agencies utilized common language/plain talk during the event.

Mr. Smith stated that was an excellent point and part of the 5 Star Team logo which says, "Plan to talk, before you push to talk."

Deputy Chief Spadafora also noted that their dispatchers practice at every opportunity.

7. New Business.

Cisco IP Interoperability and Collaboration System (IPICS). Mr. Adams advised the council DOT&PF had been in talks with Cisco about the possibility of utilizing their IPICS along the Dalton Highway but it had not passed the Defense Information Assurance Certification and Accreditation Process (DIACAP) yet, which was the standard for the Federal agencies. He pointed out they were utilizing single channel repeaters right now if they could implement an open system they could get around the patching process required for analog radios. Mr. Adams pointed out that they were also looking at a digital patching system, which could be the next generation for ALMR.

Mr. Woodall advised the IPICS was a non-trunking, conventional system with repeater voting. He explained they would still need an Inter Subsystem Interface (ISSI) to pass the information through a trunking server. He stated this type of setup would allow rural systems to tie back into systems such as ALMR. He noted ISSI is an APCO Project 25 (P25) standard that currently has no certification authority, therefore Cisco™ and Motorola™ would have to self-certify. Mr. Woodall pointed out that from an Information Assurance (IA) perspective, the ALMR System is considered a hardened system and that would have to occur to any components wishing to connect to ALMR. He also noted that as ALMR moves into the arctic region, it would be good to have these types of systems.

Mr. Adams stated~~,~~ this type of system was best suited as a gap filler for remote locations where we currently have no ALMR coverage, such as the Tok Cutoff. ~~the down side was trying to take a public access system and integrate it into public safety use.~~He also pointed out there could be problems putting Public Safety communications on a transport backbone controlled by private industry and built to support the private customer base. Mr. Adams noted during an emergency, unless public safety is given the priority, no one would be able to talk; additionally, if public safety did have priority, then the private citizen would be locked out and that is not acceptable either.

Mr. Stormo advised that the conventional system would have to be trunked first and that the current discussion only involved the proof of concept.

Deputy Commissioner John Boucher asked if this could be a viable alternative to the next generation of ALMR as they approach the point of whether the system is refreshed under the current model or transitioned to a different model.

Deputy Chief Spadafora asked if it was at a point where it could be hooked up and Mr. Adams pointed out it was not DIACAP certified.

Mr. Woodall pointed out the manufacturer has to provide IA certification before any equipment would be purchased, then a certifier would look at the system and run the tests before it was declared to meet the Federal Information Processing Standards (FIPS).

Deputy Commissioner Boucher asked if the certification process was primarily for the DOD and Mr. Woodall stated it was for any Federal agency.

Colonel Hoang explained the DOD has a process to identify and mitigate risks associated with the System certification or to accept those risks.

Colonel Hoang advised that other Federal agencies do something similar.

Mr. Stormo briefed they had discussed several scenarios and issues regarding solutions and did note that IPICS could be done over the State's local area network (LAN), which was not locked down to the DOD standards. He noted that planning and execution is the bigger concern as the State could add a site anywhere into ALMR at this time using the current standards and it would immediately work, but when you start adding different platforms that is where you have to do more planning and research.

Mr. Woodall remarked that in today's cyber environment, systems are vulnerable to attacks and the DIACAP mitigates the risks associated with such attacks.

Colonel Hoang pointed out that the DOD had enlisted a trusted agent during an exercise two weeks ago. A mock cyber war to infiltrate the communications system was part of the exercise and their cyber team was able to effectively shut down all communications and operations through vulnerabilities.

8. Next Meeting. Colonel Hoang briefed the next meeting is scheduled for December 17, at 1:30 p.m. at 5900 E Tudor Road in the Enterprise Technology Services Conference Room, but he would be on leave.

The OMO stated they would send out a request for availability and try to re-schedule the meeting when it was convenient for the majority of members.

9. Adjourn Meeting. Colonel Hoang asked if there were any other items for the council's discussion.

Hearing no comments, Colonel Hoang requested a motion to adjourn the meeting.

Motion: Adjourn the November monthly Executive Council meeting.

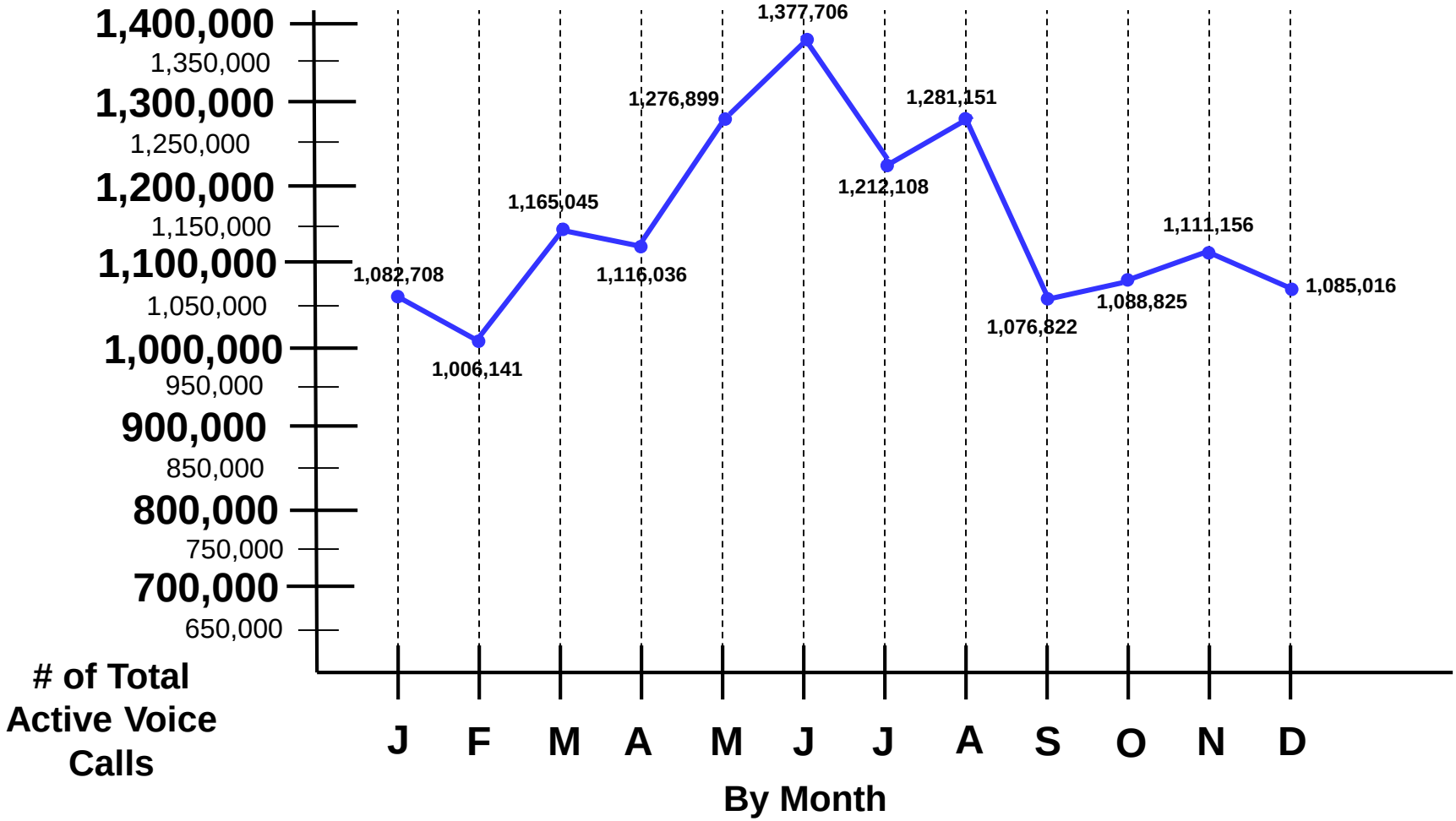
The motion was made by ASAC Condo and second by Colonel Hoang. There were no objections. **The motion was carried and approved.**

The meeting adjourned at 2:34 p.m.

Harold Hoang, Colonel, USAF
ALCOM J6/Department of Defense Co-Chair
ALMR Executive Council

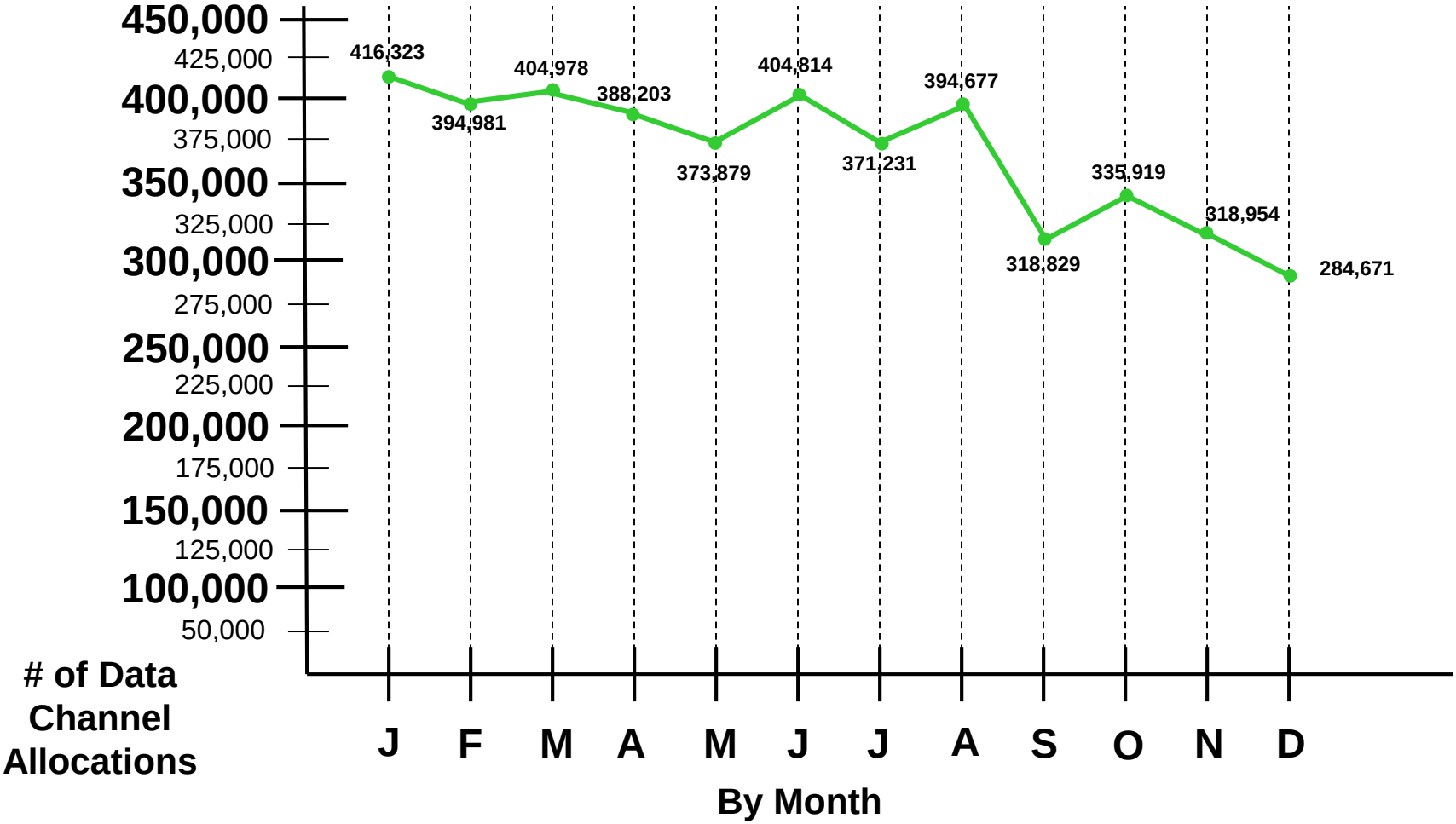
Distribution:
ALCOM/J6, Colonel Harold Hoang
FBI, ASAC Dave Condo
MOA, Deputy Chief Ken Spadafora
AML, Ms. Linda Murphy
Deputy Commissioner John Boucher
SOA ETS, Mr. Jim Bates
ALCOM/J60, LTC Glenn Mellor
SOA ETS, Mr. Scott Stormo
ALCOM/J64, Mr. Timothy Woodall
OMO, Mr. Del Smith
MOA, Mr. Trygve Erickson

2015 System Performance
Active Voice Calls



NOTE 1: February - there was an issue at Site Summit where only half of the channels were working.
NOTE 2: On April 16, all Zone 2 sites went down when the Birch Hill Master site took a power hit. The battery bank was dead and several minutes passed before the generator started.
NOTE 3: June experience several wildfires simultaneously–Card Street and Sockeye.
NOTE: 4: August - rogue "doomsday" radio at JBER tied up R1 North control channel.

2015 System Performance Data Channel Allocations



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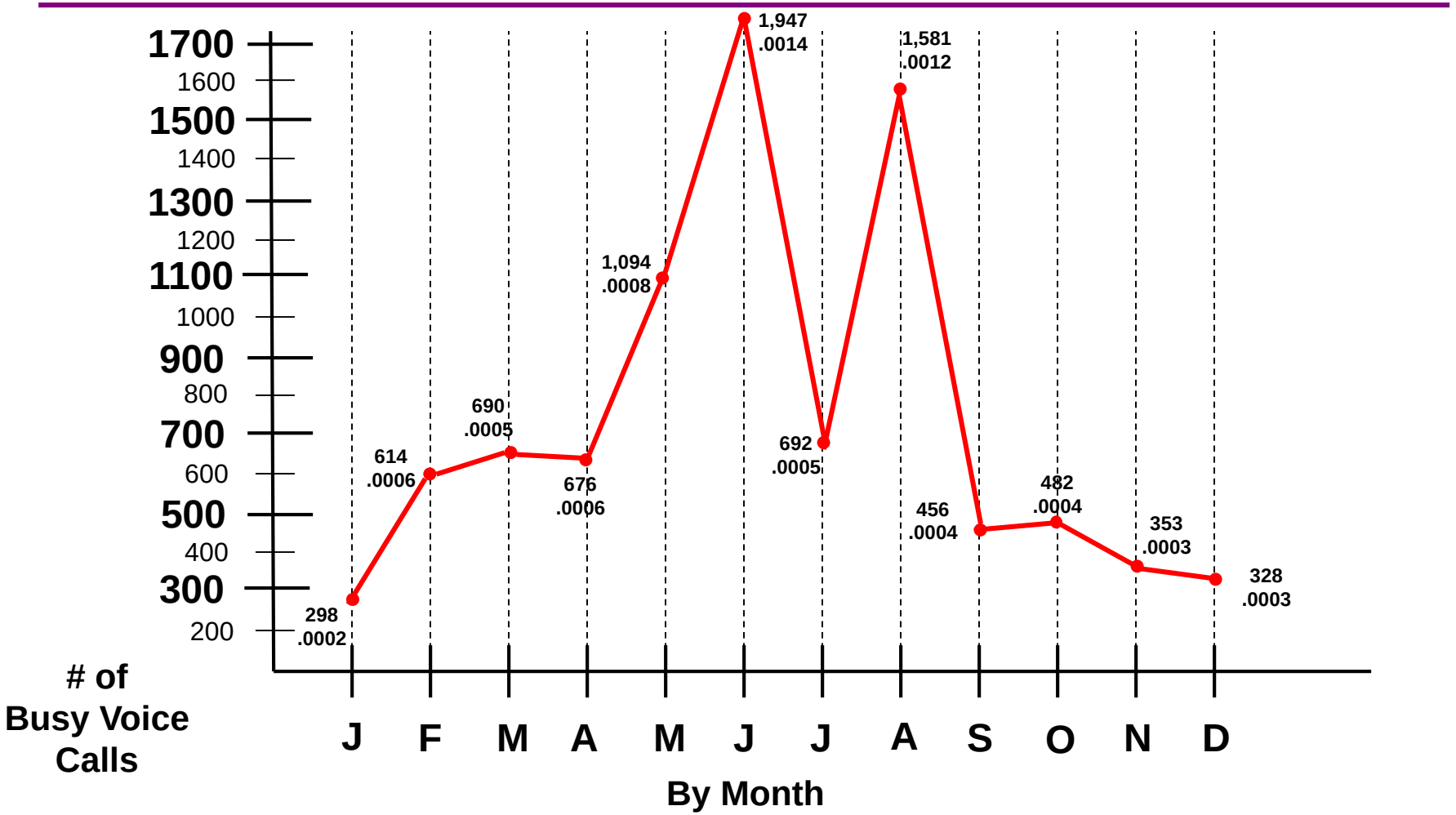
2015 System Performance
Busy Voice Calls



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Alaska Land Mobile Radio Communications System

User Council 2015 Annual Assessment on System Operations and Management Performance

January 20, 2015

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1.0 Introduction

Per the Alaska Land Mobile Radio (ALMR) Communications System Cooperative Agreement, Article 8 - User Council, Section 16.2, Performance Monitoring.

> The User Council will monitor and evaluate the performance of the System, including the efficiency and effectiveness of its operation and management, as well as the performance of contracts and user agreements. The User Council will report to the Executive Council their assessment of the operational health of the System annually, or as requested by the Executive Council.

This report provides a high-level overview of ALMR System performance monitoring by the User Council (UC) and their oversight of the day-to-day Operations and System Management functions.

2.0 Membership

At the beginning of 2015, there were 122 agencies operating on ALMR. At the end of the year, the total agencies had increased to 123 agencies with 20,344 subscriber units in service.

- Tolsona elected not to renew their membership agreement after transferring their radios to GlenRich Fire and Rescue; therefore, their account was closed and they were removed from the member agency list.
- Palmer Police Department, Palmer Fire Department, and Palmer Department of Public Works were formerly listed under one agreement for the City of Palmer Department of Public Safety (DPS). Palmer DPS was disbanded effective February 1. Therefore, all agencies acquired separate membership agreements.
- Aleutian-Pribilof Island Association account was closed and they were removed from the member agency list. Their subscriber assets were transferred to the St Paul Island Department of Community Safety and Peace.
- The Federal Aviation Administration (FAA) requested a single membership agreement encompassing all their agencies in Alaska be executed; Fairbanks Flight Standards Office was moved under the single umbrella agreement of the FAA.
- The newest member agencies to join in 2015 were the Alaska Division of Conservation – Environmental Health Lab and the State of Alaska Legislative Affairs Agency.

3.0 Metrics

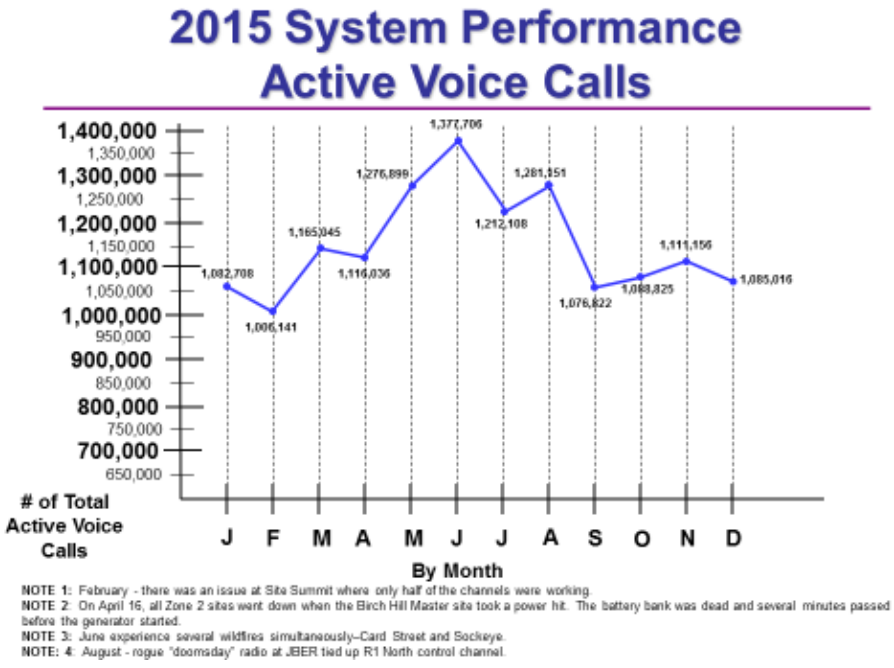
The UC is responsible for monitoring System performance and tracking various parameters including busies and voice calls per month in order to note any trends that may indicate System deficiencies. To accomplish this, they employ the Operations

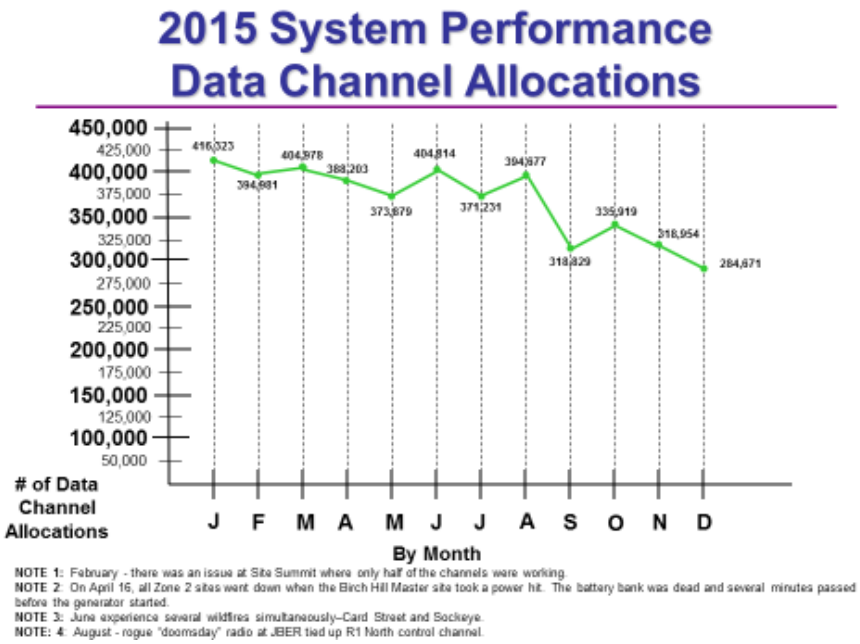
Management Office (OMO) to provide periodic reports. The OMO presents ALMR System metrics at the monthly UC meeting and also at the Executive Council (EC) meetings, as scheduled.

The UC has established a performance baseline standard, with respect to System busies, which identifies day-to-day and emergency operations data for individual sites by both the percentage and duration. When sites exceed established standards, reviews are conducted to determine whether they are related to State of Alaska (SOA) Telecommunications System (SATS) downtime, military exercises, weather-related events or a specific emergency response event.

The OMO provides monthly statistics to the UC to determine whether those sites exceeding the standard are experiencing excessive traffic due to normal seasonal traffic, or if there is simply insufficient channel capacity at the site to handle daily operations.

The following charts examine the total numbers of System voice calls and data allocations per month.





In 2015, the ALMR System supported a cumulative total of 13,879,613 voice calls and 4,407,459 data allocations. System busies for 2015 totaled 9,211, which was .0006 of the cumulative voice calls.

4.0 Conflictions/De-conflictions

There are currently no known conflicts involving ALMR frequencies.

5.0 Build out

The ALMR System was originally designed to support 105 sites. The Atwood 800MHz site was then added, as well as the two Transportable Communications Systems. The SOA also added a 700MHz site at Goose Creek Correctional Center in November 2011.

At the end of 2015, site equipment ownership was as follows (original design number versus current build-out status/ownership):

- US Army Alaska (USARAK) – 45/4(see note 1)
- Joint Base Elmendorf-Richardson – 1/1
- Eielson Air Force Base – 3/3
- Clear Air Force Station – 1/1(see note 3)
- Municipality of Anchorage (MOA) – 15/12
- SOA – 40/73(see notes 1, 2, & 4)

There are currently 94 operational sites including the 12 MOA Anchorage Wide Area Radio Network (AWARN) sites; this total does not include the transportable systems. All Department of Defense (DOD) sites have been completed and the State has completed the build out of all funded sites.

NOTE 1: In calendar year 2012, radio frequency (RF) equipment belonging to USARAK at 41 sites was transferred to the State of Alaska. This accounts for the difference in the listed numbers for the planned site build out and the current number of owned sites.

NOTE 2: St Paul Island is not included in the above total operational site count due to the fact it has no reach back capability to the rest of the ALMR System and operates only in site trunking mode. However, it does have an assigned ALMR site number and is under control of St Paul Island Public Safety. (With the site added, this brings the total ALMR sites to 83.)

NOTE 3: The Clear site (AT&T location) was shut down on April 15, 2013, and the equipment was removed on July 10, 2013.
Update: On March 6, the new five-channel site, utilizing the equipment from the previous AT&T location, was installed on Clear Air Force Station. This noted item will be **CLOSED** effective this report, although at this time there still remains some uncertainty regarding the finality of the current location.

NOTE 4: The Atwood 800MHz site was removed in May 2013 to utilize as a test bed for the 7.13 System software update. The decision was made at the February 5, 2014, User Council meeting not to reinstall the site at Atwood. The System Change Request was approved by the Executive Council on February 26, 2014.

6.0 System Coverage Issues

ALMR was originally designed and built to provide coverage along the major roadway system in Central and South Central Alaska, major population centers in Southeast Alaska and some portions of the Marine Highway.

During 2015, several previously identified coverage issues continue to be tracked by the OMO.

- **Skagway** (carried forward from 2010)
  The ALMR site at Skagway does not provide coverage over the last six miles of the Klondike Highway. This is the section that is most intensively maintained, and the area where whiteouts, blowing snow, and avalanches occur. When maintenance crews are in these areas, they must use a conventional DOT frequency for communications, which is often interfered with by truckers using the highway.

  DOT has suggested that an ALMR repeater be installed on Mine Mountain. This would cover the portion of the highway that currently has no ALMR

coverage. However, Mine Mountain is remote and does not have power. The DOT&PF planning section offered to assist with funding, if a plan can be put together.

NOTE: There was no change to the status for this item in 2015.

- **Houston** (carried forward from 2010)
  The Technical Advisor traveled to the Houston area to investigate an issue with poor portable coverage reported by Houston PD. One of the immediate problems noted was that the radios did not have a "most preferred" tower site programmed. During the coverage checks in the Houston area, the only tower sites that were accessible were Site Summit, Cottonwood, and Rabbit Creek. Of the three, Site Summit provides the best site coverage for the affected area. It was suggested that when the agency programs their radios, they should consider making Site Summit the "most preferred' site.

  The System Manager noted that there had been some discussion about a new tower site along the Knik Goose Bay Road in Wasilla. There is an existing tower in the area that could provide excellent coverage throughout the Houston area. However, it may take several years to add an additional radio site if/when funding is approved.

  Subsequently, the only option available at this time, which could improve Houston PD portable radio coverage in the near future, would be for them to acquire/install in-vehicle repeaters. It was suggested they contact Soldotna PD, who had installed several in their police vehicles and were reportedly satisfied with the improved reception capability.

  NOTE: The City of Houston deactivated the Police Department in 2011 and is no longer a member of the ALMR System. **There was no change in the status for this item in 2015.**

- **North Pole** (carried forward from 2008)
  Previously, a System Design/System Analysis was completed at the request of Fairbanks North Star Borough and local public safety agencies regarding the potential for an additional site in the North Pole area. The report was published in March 2008.

  At the time of the original ALMR System design, it was determined that a site was not required in the North Pole area as the projected coverage met the design requirements for mobile subscriber units. Funding options for a North Pole site continue to be explored.

  Update 2012: Mr. Jim Kohler met with Chief Jeff Tucker, North Star Volunteer Fire Department, and they looked at possible places where the site could be co-located with existing infrastructure to save on costs of building a green site. At

the end of 2012, the State was awaiting response from an organization regarding a co-location agreement and cost estimates.

Update 2013: At the May 1 User Council meeting, further exploration regarding a North Pole site was **tabled**.

NOTE: There was no change in the status of this item in 2015.

- **Delta Junction** (carried forward from 2008)
  Delta area agencies advised the OMO in 2008 that ALMR coverage was no longer satisfactory and had degraded over the course of time. At that time, the OMO requested Motorola determine if the initial projected coverage in the area had been detrimentally affected by the relocation of the former Delta Junction site to Donnelly Dome, concurrent with the relocation of the former Donnelly Dome site to Ft Greely, and/or finally by the addition of a cellular antenna array to the Ft Greely tower.

  Motorola performed a thorough preventative maintenance inspection of the ALMR transmission/receiver equipment and a sweep of all lines/antennas and determined that all equipment was working within specifications. Additionally, Motorola determined there was a strong possibility that the Ft Greely tower cellular antennas, and additional lines, were causing an RF shading/obstruction condition to occur in the direction of Delta Junction.

  Motorola documented they believe an interference condition does exist in the area and is causing the observed radio behaviors and changes to the over-the-air signal levels. The source of this interference is a combination of tower obstruction/shading, land clutter (foliage), multi-path, and potentially outside RF interference.

  USARAK advised the UC at the Annual Training Conference in September 2009 that they would work with AT&T and the SMO to isolate the antenna on the tower in order to determine if the modifications by AT&T were causing degradation. Testing by the SMO indicated that there was no RF interference. USARAK is continuing to work the issue from their end.

  Update 2012: Follow up testing, which involved a change of the ALMR transmit antenna at the site did not resolve the coverage issues that have been experienced. Additionally, no specific interference source was identified that could be mitigated.

  At this time, no further action is planned as the site, which is operating within specifications, as confirmed with previous testing. This issue is determined closed.

Update 2013: The issue was re-opened at the May 1, 2013, User Council meeting when it was suggested coverage in the Delta area should be re-engaged as an existing coverage area that is underserved. Mr. Jordan Halden had met with a large group at Delta who stated although the mobile coverage was sufficient; the portable coverage was inadequate particularly over the ridge at Delta to Jack Warren Road. They felt they had much better coverage before the Delta Junction site was moved to Donnelly Dome.

Additionally, it was noted the Troopers could point out exactly on a map where they can't get coverage in the Delta area. The System Manager agreed there were areas where both mobiles and portables have issues. The User Council requested ETS look at the Delta area for enhancing coverage and were advised that Spring 2014 might be the soonest ETS could begin serious exploration.

Update March 2014: System Manager, Mr. Casey Borg, traveled to Delta Junction to talk to Mr. Ernie Wyrick, as well as representatives for AST, DOT and possibly Forestry, regarding coverage concerns in the area, and to find out what could be done to facilitate better coverage. The final coverage report was published September 9, 2014, and contained two recommendations: 1) complete subscriber periodic maintenance inspections; and 2) add another site to the area. **NOTE:** Funding for an additional site at this location is not currently available.

NOTE: There was no change in the status of this item in 2015.

- **Chena Dome/Chena Hot Springs Road** (carried forward from 2013)
  At the May 1 User Council meeting, the council was briefed that Chief Jeff Tucker, North Star VFD, had mentioned Chena Hot Springs where there is no ALMR coverage, but only a conventional site where power is problematic.

  Major Leveque briefed there is a conventional site AST has access to, but he had talked to his troopers who stated there is virtually no coverage there even on the conventional side.

  DOT engineers were looking at how to bring down the cost to implement Chena Dome, but it would still be a significant cost regardless. ETS was requested to explore the Chena Hot Springs Road site and were advised that spring 2014 might be the soonest ETS could begin serious exploration.

  The Stuart Creek 2 wildfire, in July, reached the Chena River and prompted an evacuation along Chena Hot Springs Road for residents between mileposts 18 and 34. This emphasized the need for expansion of ALMR into this area.

  NOTE: There was no change in the status of this item in 2015.

- **FS12** (carried forward from 2014)
  During a joint meeting of ETS and ALMR OMO and SMO staff, the determination was made to shut off four channels at the FS12 site, which was currently running nine channels. Busies at surrounding sites were tracked to determine the impact. The proposed purpose for the channel reduction at FS12 would be to utilize the removed channels to upgrade three-channel sites with high busy rates identified by the UC for capacity increases. The decision to leave the channels off was agreed upon by ETS and ALMR and approved by the User Council at the May 7 meeting; channels will remain at the site until such time they are needed elsewhere. Channels 7, 8 and 9 were indefinitely deactivated and the System Change Request was approved by the Executive Council on July 26. Channel 10, although now licensed, remains turned off.

  NOTE: There was no change in the status of this item in 2015.

- **Valdez** (carried forward from 2014)
  At the July 2, User Council meeting, Chief Bill Comer of Valdez Police Department briefed the council regarding coverage shortfalls in the Valdez area, which created an officer safety issue.

  NOTE: There was no change in the status of this item in 2015.

- **Sitka site** (carried forward from 2014)
  The decision was made to pursue installation of a site at Sitka, which was one of the original locations planned for ALMR build out in the southeast. The failure of the Daniels repeater installed by ETS several years back contributed to the decision to move forward, as well as the availability of equipment which was previous removed from the Rabbit Creek site when the GTR8000 six-pack was installed. Planning had just begun in December; therefore, final installation was unknown at the time.

  Update: Equipment from the Rabbit Creek site was shipped to the Sitka site the week of January 5. The System Change Request to install a VHF site at Sitka was approved on February 25. T1 connectivity was completed, but the completion of the site is pending the necessary funding. The Sitka site went into wide area on September 2, 2015, but was not declared operational due to continued connectivity issues.

7.0 On-going Projects

The following equipment upgrades or replacements took place in 2015.

- Quantar replacements - Quantars®, which will soon reach their end of life, will be replaced by GTR8000s. The following DOD-owned sites were upgraded during calendar year 2015.

- Transportable Area South (TAS)(completed February 18)
- Transportable Area North (TAN) (completed February 25)
- R1 North (completed February 28)

NOTE: Disposition of the surplus Quantars® is still pending DOD decision.

- Channel capacity enhancements – the plan is to add capacity to all existing three-channel sites, as the need is identified and funding becomes available
  - One additional channel was added to the Pipeline Hills site on February 23

8.0 Contractor Performance

8.1 System Documentation. The OMO is responsible for auditing and control of the policies, plans and procedures, which provide for the accountability, compliance, performance and monitoring assessment of the ALMR System.

Documents are reviewed annually and updated, as necessary, to reflect changes to System performance parameters or operational mandates. The status of ALMR documentation for 2015 is:

- 76 total reviewed
- 75 updated/approved
- 1 outstanding
  - 2015 Business Case (awaiting Executive Council approval)
- 68 reviewed/approved by the OMO
- 2 newly developed by OMO
  - Subscriber Equipment Testing Policy and Procedure 400-18
- 5 reviewed/approved by the UC

8.2 Equipment. The OMO performs third party Quality Assurance/Quality Control (QA/QC) of System Management Office (SMO) functions and general System oversight on behalf of the stakeholders/member agencies. Physical inspections of critical /sensitive equipment are required.

8.2.1 Key Variable Loaders

As part of the OMO QA/QC contractual requirement, a quarterly physical audit of Key Variable Loaders (KVLs), under the control of the SMO, is conducted and compared against those listed on the SMO equipment inventory. The results are as follows:

- **Date of Inspection:** January 23
  Findings: The ten KVLs which are listed on the SMO equipment inventory were inspected or accounted for, one of which is hand-receipted on loan to the Municipality of Anchorage.

- **Date of Inspection:** June 2
  Findings: The ten KVLs which are listed on the SMO equipment inventory were inspected or accounted for, one of which is hand-receipted on loan to the Municipality of Anchorage.

- **Date of Inspection:** September 14
  Findings: The ten KVLs which are listed on the SMO equipment inventory were inspected or accounted for, one of which is hand-receipted on loan to the Municipality of Anchorage.

- **Date of Inspection:** December 8
  Findings: The ten KVLs which are listed on the SMO equipment inventory were inspected or accounted for, one of which is hand-receipted on loan to the Municipality of Anchorage.

8.2.2 Infrastructure Equipment Spares

As part of the OMO QA/QC contractual requirement, a quarterly ALMR Random Infrastructure Equipment Spares Inventory inspection is performed on five randomly selected items from the SMO, Asset Manager's Infrastructure Spare Equipment Inventory list. The results are as follows:

- **Date of Inspection:** February 27
  - **Details:** Physical inspection of the equipment took place at the Bering Straits Information Technology (BSIT) facility located in Wasilla, Alaska, on 12 and 27 February. The five items randomly selected for inspection were: AC Distribution Panel – USARAK – ALMR1001214 – Transector – Model RMP-920A – Located 2/12/15
  - MotoBridge® CWGU – ALCOM – ALMR3001080 – Motorola® – Model F2688A – Located 2/12/15
  - Quantar® Power Supply – SOA – 13-17055 – Motorola® – Model TLN3377A – Located 2/12/15
  - Digital USB Camera Card Reader – ALCOM – ALMR3000210 – Sakar – Model CR-45N – Located 2/27/15
  - Scanning Tool Charger – ALCOM – ALMR3001035 – Symbol – Model CRD3000-1000R – Located 2/27/15

  Findings: All of the above items were located and asset tag numbers verified.

- **Date of Inspection:** N/A
  Details: The SMO requested the second quarter spares audit, which had been scheduled for the last week of June, be delayed due to their being busy with the end of the contract year financial closing, monthly financial closing and contract renewal.

Findings: The Operations Manager approved the delay with the caveat that this report reflect the reason for the delay, which prevented accomplishment of the second quarter equipment audit by the OMO.

- **Date of Inspection:** September 11
  Details: Physical inspection of the equipment took place at the Bering Straits Information Technology (BSIT) facility located in Wasilla, Alaska, on 11 September. The five (5) items randomly selected for inspection were:
  - Switch – ALCOM – ALMR2000234 – HP – Model Procurve 2524 – Located 9/11/15
  - Inventory Scanner Power Supply – ALCOM – ALMR3001040 – HIPRO – Model HP-0204D43 – Located 9/11/15
  - Quantar® Range 1 Receiver – SOA – 13-17084 – Motorola® – Model TLN3250A – Located 9/11/15
  - Quantar® Range 2 Exciter – SOA – 13-17091 – Motorola® – Model TLN3253A – Located 9/11/15
  - Quantar® DC Power Supply – USARAK – ALMR1001365 – Motorola® – Model TLN3377A – Located 9/11/15

  Findings: All of the above items were located and asset tag numbers verified.

- **Date of Inspection:** December 7
  Details: Physical inspection of the equipment took place at the Bering Straits Information Technology (BSIT) facility located in Wasilla, Alaska, on 7 December. The five (5) items randomly selected for inspection were:
  - Computer CDRW Drive – USARAK – ALMR1001373 – TEAC – Model CD-W5125 – Located 12/7/15
  - Quantar® Range 2 Exciter– SOA – 13-17096 – Motorola® – Model TLN3253A – Located 12/7/15
  - Controller – ALCOM – ALMR2000255 – Motorola® – Model T6784A – Located 12/7/15
  - Quantar® Range 2 Exciter – SOA – 13-17089 – Motorola® – Model TLN3253A – Located 12/7/15
  - Power Supply – USARAK – ALMR1001669 – Transector – Model RMP-615A – Located 12/7/15

  Findings: All of the items were located and asset tag numbers verified.

8.2.3 Catastrophic Natural Event Cleanup Kits

As part of the OMO QA/QC contractual requirement, a periodic inventory inspection is performed on a sampling of the Catastrophic Natural Event (CNE) cleanup kits maintained by the SMO.

Date of Inspection: December 22
Details: Inventory inspection was performed on all four kits at the Bering Straits facility, located in the Wasilla.

Findings: Kit number one was disassembled and the case apparently used for transporting antenna installation hardware. The only materials in the case were cable ties and tape. The System Manager advised that he will have the kit rebuilt and a follow-up compliance inspection will be performed in the January/February timeframe.

All items were located and inspected in kits 2, 3 and 4 with the exception of the case of water in each kit. Bottled water has a "Use by Date" and has to be rotated periodically. It is suggested that the SMO purchase the required bottled water and develop a schedule for swapping out the water as expiration dates near.

8.3 System Recovery Plan

In accordance with System Recovery Procedure 400-1, the System Recovery Plan shall be tested annually and all results of the test shall be recorded. The Security Manager shall be responsible for overseeing the testing and verifying that the results have been recorded. Results of the testing will be presented to the User Council.

NOTE: Real-world occurrences of, and response to, System failures shall meet the annual test requirement.

- **Date of Incident:** February 6
  Details: 0218 AM – Site Summit – Not Wide Trunking (Bouncing)
  Findings: On February 6, 2015 at approximately 0218 AM the Site Summit Site, "site controller 2" was found to be in a failed state and needed to be replaced. This was observed by Mr. Travis Conant during troubleshooting the equipment alarms for Site Summit. Due to the severity (Severity 1), this equipment replacement and configuration was place on a scheduled maintenance for February 9th or 10th. Due to inclement weather at the site during winter months, which requires a helicopter, technicians will attempt to replace the site controller at the earliest opportunity. Initial troubleshooting efforts began on Friday morning, February 6, 2015.

  After the hardware issues were discovered during the troubleshooting, Mr. Conant discussed replacement, configuration, and repair options. Mr. Conant retrieved a spare site controller, configured with the correct version operating system, configured the securities and installed the new device. Securities lockdown and discovery of the new device were configured at the Tudor Road Master Site and tested to ensure proper operation before closing out the maintenance ticket with Motorola. The bad site controller was reported to Motorola for an advanced replacement part, which was placed back into storage.

  The hardware failure was not the result of a cyberattack. No data breach occurred. The tape drive was replaced and the tape media continued to be used after the drive was operational. In this event media disposal was not necessary

and replaced equipment was sanitized before decommissioning IAW ALMR and DOD policies and procedures.
Results: On February 10, 2015 the team replaced a fully functioning "site controller 2." Total site downtime was 20 minutes during which the site was off to refresh the ASTRO 25 system at the site. System recovery plan successful.

- **Date of Incident:** February 20
  Details: 1444 PM – Birch Hill Master Site – One half NICE Dual Tape Drive Bad
  Findings: On February 20, 2015 at approximately 1444 PM at the Birch Hill Master Site one half of a two-bay NICE Backup Tape Drive (Dual DAT 72) was found to be in alarm and not functioning. This was observed by Mr. Andy Strait during troubleshooting the equipment and found that the NICE Backup Tape Dual Drive needed to be replaced. This equipment doesn't have spares at the site and needs to be replaced by the vendor. Due to the severity (Severity 2), this equipment was ordered for replacement upon arrival. In the interim, backup drives automatically picked up when the primary drives failed. Drive bay arrived February 20, 2015 and was replaced. Initial troubleshooting efforts began on Friday, February 20, 2015.

  The hardware failure was not the result of a cyberattack. No data breach occurred. The tape drive was replaced and the tape media continued to be used after the drive was operational. In this event, media disposal was not necessary and replaced equipment was sanitized before decommissioning IAW ALMR and DOD policies and procedures.
  Results: On February 20, 2015 the team replaced a fully functioning "NICE Backup Tape Drives". Total site downtime was zero days. Awaiting advanced replacement parts for the redundant backup system and installation was 11 days. System recovery plan successful.

- **Date of Incident:** March 23
  Details: March 23, 2015, 1157 PM – Pillar Mountain – Channel 4 Power Amplifier; possible loose cable
  Findings: On March 23, 2015 at approximately 1444 PM at the Pillar Mountain site "Channel 4 Power Amplifier" with a possible loose cable was in alarm. This was observed by Mr. Travis Conant during troubleshooting the equipment and found that the dual isolator for Channel 4 was bad and needed to be replaced. The dual isolator required repair; replaced capacitors, applied 5W load and retuned to 156.0750 MHz. This case had minimal impact on the entire site as a whole (Severity 3). Mr. Matt Oliver replaced the dual isolator and enabled Channel 4. Initial troubleshooting efforts began on Monday, March 23, 2015.

  The hardware failure was not the result of a cyberattack. No data breach occurred. The tape drive was replaced and the tape media continued to be used after the drive was operational. In this event, media disposal was not necessary

and replaced equipment was sanitized before decommissioning IAW ALMR and DOD policies and procedures.
Results: On Monday, March 23, 2015 the team replaced the channel 4 dual isolator and enabled channel for use. Total site downtime was zero days. Only channel 4 was out of service until repairs could be made. System recovery plan successful.

- **Date of Incident:** March 29
  Details: 1556 PM – Auke Lake – Channel 1 Power Amplifier, Critical Failed PA, Forward Power, Bouncing
  Findings: On March 29, 2015, at approximately 1556 PM the Auke Lake, "site controller 1" was found to be in a failed state and needed to be replaced. This was observed by Mr. Travis Conant during troubleshooting the equipment alarms for Auke Lake. Due to the severity (Severity 2), this equipment replacement and configuration was place on a scheduled maintenance for March 30th. Initial troubleshooting efforts began on Monday morning, March 30, 2015.

  After the hardware issues were discovered during the troubleshooting, Mr. Conant discussed replacement, configuration, and repair options. Mr. Conant retrieved a spare site controller, configured with the correct version operating system, configured the securities and installed the new device. Securities lockdown and discovery of the new device were configured at the Tudor Road Master Site and tested to ensure proper operation before closing out the maintenance ticket with Motorola. The bad site controller was reporting to Motorola for advanced replacement part and placed back into storage.

  The hardware failure was not the result of a cyberattack. No data breach occurred. The tape drive was replaced and the tape media continued to be used after the drive was operational. In this event, media disposal was not necessary and replaced equipment was sanitized before decommissioning IAW ALMR and DOD policies and procedures.
  Results: On March 30, 2015 the team replaced failed controller with a fully functioning "site controller 1." Total site downtime was 15 minutes during which the site was off to refresh the ASTRO 25 system. System recovery plan successful.

- **Date of Incident:** May 6
  Details: 0955 PM – Tudor Road Master Site – KMF CryptR Failing
  Findings: On May 6, 2015 at approximately 0955 AM at the Tudor Road Master Site the "KMF Server CryptR" was found to be in alarm and not functioning. This was observed by Mr. Mark Jenks during troubleshooting the equipment and found that the CryptR failed and needed to be replaced. This equipment doesn't have spares at the site and needs to be replaced by the vendor. Due to the severity (Severity 1), this equipment was ordered for replacement upon arrival.

Upon receiving the new CryptR it was installed and was fully operational. Initial troubleshooting efforts began on Wednesday, May 6, 2015.

The hardware failure was not the result of a cyberattack. No data breach occurred. The tape drive was replaced and the tape media continued to be used after the drive was operational. In this event, media disposal was not necessary and replaced equipment was sanitized before decommissioning IAW ALMR and DOD policies and procedures.
Results: On May 9, 2015 the team replaced the failed module with a fully functioning "KMF CryptR" module. Total site downtime was three days; no keys were being passed to radios upon re-key via over the air rekeying. Radios operated without issue on the trunking system, but required manual input of keys during this period of time. Awaiting advanced replacement parts for the redundant backup system and installation was three days. System recovery plan successful.

NOTE: Results of System recovery efforts are also listed in the annual System Recovery Assessment and Backup-Recovery Report, dated December 8, 2015.

8.4 Subscriber Inventory. In February 2012, the State Legislative Budget and Audit Committee was requested by a member of the Legislature to perform an audit of the ALMR System. The audit took well over a year to complete and in December 2013, the Legislative Audit Final Summary was released with a single finding.

Findings and Recommendations:

Recommendation No. 1

ALMR executive council should ensure user agencies conduct an annual inventory of ALMR equipment.

To correct the discrepancy, the ALMR Executive Council appointed the OMO as their executive agent for the annual audit. Therefore, at the beginning of each calendar year, the OMO prepares and distributes an instruction letter to each user agency with an accompanying confirmation form to sign and return.

For calendar year 2015, 120 agencies performed an audit of their assigned subscribers, took the necessary actions to remove/disable/add subscribers, where required, and returned the completed confirmation form. The audit was completed on June 9, with the receipt of the final agency form.

NOTE: Agencies who have valid membership agreements, but who have no subscribers programmed on the System, were not required to complete and return the confirmation form for 2015. Those agencies were Chitina Volunteer Fire Department and the Chickaloon Village Tribal Council Justice Department.

9.0 Periodic Maintenance Inspections (PMIs)

Effective July 1, 2013, the OMO began a new contract year and the QA/QC oversight of SMO was re-added to the performance-based work statement. The OMO is responsible for providing QA/QC oversight of periodic maintenance inspections (PMIs) conducted by the SMO on ALMR sites on behalf of the UC. This process provides third party assurance that the sites are maintained to a standard in accordance with the Service Level Agreement (SLA) and identifies outstanding discrepancies that could potentially affect site operations.

During 2015, there were a total of 26 PMIs QA/QC inspected by the Technical Advisor. This meets/exceeds the OMO contract and statement of work (SOW) for 25 percent of all ALMR sites to be inspected annually. PMI QA/QC inspections were performed at the following sites.

Covered under SOA FY15 (12):

- R1 North
- Quarry Hill
- Atwood
- Pillar Mountain
- Womens Bay
- Pipeline Hills
- Sterling
- Kenai
- Diamond Ridge
- Anchor River
- Yanert
- Garner

Covered under SOA FY16 (14):

- Skagway
- Haines
- Nenana
- Clear
- Money Knob
- Lions Head
- Hill 3265
- Site Summit
- Blueberry Hill
- Harding Lake
- Donnelly Dome
- Fort Greely
- Canyon Creek

- Alcantra

NOTE 1: St Paul Island is excluded from PMI QA/QC as it has no reach back capability and ownership was transferred to the St Paul Island Department of Public Safety.
NOTE 2: The Technical Advisor traveled to the Ninilchik site on April 15 with the System Management Office Technologist, but the PMI could not be completed due to a bad service monitor.

10.0 System Enhancements

A backup battery plant was installed at the Birch Hill Master Site on November 16 – 17. This upgrade was prompted by an unscheduled outage on April 16, when the site took a power hit and the backup generator failed to start. The entirety of Zone 2 was in site trunking for approximately two hours.

11.0 Supported Events

11.1 On-going Agency Training

Many opportunities exist to allow the UC to further interoperability throughout the State, and remain up to date on current national standards. The Performance-Based Work Statement for the OMO allows the UC to utilize the OMO staff to contact member agencies, prospective member agencies, legislators, and other interested groups to disseminate information about ALMR.

For calendar 2015, $19,730 was spent on radio training and emergency communications planning for ALMR-specific agencies using funding from FY 2015 and FY 2016. The administering office for the contract was the 5 Star Team.

Training was conducted for 155 individuals from the Alaska State Troopers Detachment E, Nikiski Volunteer Fire Department, Kenai Fire Department, Kenai Police Department, Soldotna Police Department, Kenai Peninsula Borough Emergency Services and the Matanuska-Susitna Borough School District.

Additionally, the final after action report for the Funny River Fire, dated September 29, 2015, was also distributed to the User Council.

11.2 Transportable Deployment

The SMO supports the deployment and re-deployment functions for the transportable communications system at the direction of the DOD.

The TAS was deployed to Fort Richardson in support of a pre-COOP exercise from May 26 - 29.

The TAS was deployed to US Marine Corps facility on Joint Base Elmendorf-Richardson in support of an actual COOP, which took place from August 19 – 20. The TAS remained in place to support Exercise Vigilant Shield 15 from November 2 – 6.

12.0 Finance/Budget

In accordance with the Cooperative Agreement, the UC will establish a budget process and each year develop a proposed budget for the next fiscal year to meet the operating, maintenance and capital replacement needs of the System and shall submit the proposed next year's budget to the EC. All proposed expenditures and activities of the System, as well as funding sources, shall be reflected in the proposed budget.

The proposed FY17 OMO/SMO Operating Budget was approved by the UC on July 14 for presentation to the EC. The EC approved the budget on September 8 and agreed it should be submitted into the SOA budget cycle for consideration of funding.

The SOA Governor's proposed FY17 budget was released on December 9 and noted a reduction of $171.1K for ALMR on top of those reductions previously imposed in FY16 and an additional reduction for SATS of $247.7K. The Legislature had yet to address the Governor's proposed budget at the time of release of this report.

13.0 Other Focus Areas

Additional areas currently being tracked:

- **SATS**

  The continuing improvement of the State of Alaska Telecommunications System, often referred to as "SATS," reached another milestone.

  The capital funds appropriated for deferred maintenance over the prior five years enabled SATS to replace several end-of-life devices with modern technology, greatly improving its reliability.

  The updated microwave and multiplex equipment now have "fast reroute" implemented. The benefit is that critical services like the trunked ALMR System, Positive Train Control (PTC) system, Power Transmission Line Supervisory Control and Data Acquisition (SCADA) and other services will be automatically and almost instantly rerouted in the event of a link failure.

  The SATS topology has been augmented through partnerships with the Alaska Railroad, the Department of Defense and several power utilities to create "rings," which provide the opportunity to reroute traffic for all of the partners.

The new Multi-protocol Label Switching (MPLS) equipment, now installed in almost the entire SATS network, provides this ability and has been configured to prioritize and automatically reroute traffic in the event of a failure anywhere on a ring. This fast reroute also improves the ability to update and maintain communications links and sites without service interruptions.

The SATS network architects are continuing to develop ways to "close the rings" for the sites that are still on "spokes" with only one way into or out of the network, as well as extend coverage beyond the existing network.

There is a need for continued deferred maintenance funding to operate and maintain the $200+ million SATS system. We understand how important SATS service is to our various customers and the vital services they provide to the people of Alaska.

ETS will be requesting additional funds during future budget cycles in order to continue to improve the resiliency of the SATS system.

- **Outstanding Maintenance**

  Delays in addressing R56 grounding at some SOA sites continues to be a major concern, some now being over 11 years old.

NOTE: SOA maintenance and milestones are briefed at the monthly UC meeting.

14.0 Conclusion

This report addresses the status of various issues regarding the operation and management of ALMR and outstanding items noted during this calendar year, or carried forward from previous years.

The efficiency and effectiveness of the OMO and SMO in performance of their contract functions met the expectations of the UC. The overall health of the ALMR System is currently good. The three-channel sites continue to be monitored and the channel capacity upgraded, as the need dictates and funding becomes available.

Issues of grave concern:

- The Gold Elite dispatch consoles have reached their end of life, but will continue to function normally until the 7.15 System software platform update (or beyond).

- Likewise, the Motorola™ Quantars®, have reached their end of life. Maintenance will no longer be supported at the depot level and replacement repair parts may become limited. These infrastructure items will need to be replaced with GTR 8000s in order to keep the System functioning at optimal performance levels.

- Past reductions to the ALMR maintenance budget increased response times to SOA site issues. These delayed responses continue under the current FY16 budget and are further exacerbated by the Administration's proposed FY17 budget. Critical equipment spare quantities are very limited and the proposed level of funding increases the possibility of delays in securing spare equipment and funding travel of maintenance personnel to sites to replace malfunctioning equipment. Additionally, availability of funding for refurbishment of equipment to be reused is very limited under the FY16 budget and has the potential to be further reduced in the proposed FY17 budget

Other areas of concerns that will continue to be monitored by the OMO and SMO are: 1) securing long-term funding for System upgrades and equipment end-of-life replacements, as well as the day-to-day operations and maintenance of ALMR; and 2) capacity enhancements at remaining three-channel sites.

Alaska Land Mobile Radio Communications System

Operations Management Office
2015 Annual Information Assurance Audit
Report of Findings

January 6, 2016

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The Alaska Land Mobile Radio (ALMR) Communications System Operations Management Office (OMO) is tasked with day-to-day oversight of the operational System. As part of their responsibilities, they randomly audit the administration and controls of certain tasks required under the Information Assurance (IA) Program.

There are five areas of audit/inspection the OMO oversees:

- Physical Security – managed by State of Alaska (SOA) Enterprise Technology Services (ETS)
- System Management Media Backup Storage – managed by the System Management Office (SMO) and the ALMR Security Manager (SCM)
- System Log In Report – managed by the SMO and SCM
- Information Assurance Control Review – managed by the SCM
- System Vulnerability Assessment – managed by the SMO and SCM

1.0 Physical Security

Physical security areas encompass the OMO, SMO, zone controller space and the routes to access any of these areas.

Physical security audits consist of unannounced penetration attempts by any visitor to bypass existing security policy/measures and gain access to a location with an opportunity to potentially cause harm to persons or property within the below described areas. The audit complies with established ALMR Facility Security Penetration Policy 200-2.

The OMO will conduct unannounced security penetration auditing at a minimum of once each calendar year at the SOA ETS facility located at 5900 E. Tudor Road, Anchorage, Alaska. Penetration attempts will focus on the ALMR OMO, SMO, and the Zone Controller areas of the facility, and the access routes to them.

Date of Audit: December 8
Procedures: The OMO Technical Advisor walked the perimeter of the ETS facility and tested all entry points seeking unannounced entry into the facility.
Observations: All facility entry points were checked and found to be closed and secured.
Follow-up Actions: None

2.0 System Management Media Backup Storage

Backups enable the rapid recovery of the ALMR System in the event of a disaster, either man-made or natural. Established controls and procedures minimize the impact to System users and ensure an expeditious return to operations. Backup media must be stored and protected in a manner which minimizes the risk of loss, damage, or destruction.

In accordance with ALMR policy, all backup media will be clearly labeled to ensure the media content can be quickly recognized. Back-up copies (or 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 operational software. This material will be stored within a secure area that is restricted to authorized individuals only. Additionally, all backup media created from daily/weekly backup procedures will be stored in an offsite location.

All backup media for the South Zone Controller is stored at Department of Public Safety (DPS), 5700 E. Tudor Road, in Anchorage and for the North Zone Controller at the Fairbanks Police Department, 911 E. Cushman Street, in Fairbanks.

The OMO conducts unannounced, random monthly audits of the backup media storage facility. Due to travel funding issues, audits of the North Zone Controller backup storage are only conducted when OMO staff is in the Fairbanks area for other activities.

2.1 Monthly Backup. Results of the monthly audits for the System software/media backups are as follows:

- **Date of Audit:** January 22
  Location: 911 E. Cushman St., Fairbanks
  System Configuration Software Present: Yes
  Media clearly labeled: Yes
  Findings: Arrangements were made in advance for access to the Fairbanks Police Department area where the storage container is located. The container was in an acceptable/secured location and locked.
  NOTE: Since the last visit, the tape storage container has been relocated from the dispatch center to room 206G, which is currently a locked storage room in the Police Department.
  Corrective Action: None

- **Date of Audit:** January 27
  Location: 5700 East Tudor Road
  System Configuration Software Present: Yes
  Media clearly labeled: Yes
  Weekly KMF backup CD: January 22
  Log Entry: January 27
  Findings: No issues were raised with access to the Alaska State Troopers (AST) building; exterior door was secure upon arrival, access card worked, and the safe was in an accessible location. The storage container is located behind a gated/locked enclosure on the lower level.
  Corrective Action: None

- **Date of Audit:** February 23
  Location: 5700 East Tudor Road
  Weekly KMF backup CD: February 19
  Log Entry: February 23
  Findings: No issues were raised with access to the Alaska State Troopers (AST) building; exterior door was secure upon arrival, access card worked, and the safe was in an accessible location. The storage container is located behind a gated/locked enclosure on the lower level.
  Corrective Action: None

- **Date of Audit:** March 26
  Location: 5700 East Tudor Road
  Weekly KMF backup CD: March 19
  Log Entry: March 26
  Findings: No issues were raised with access to the Alaska State Troopers (AST) building; exterior door was secure upon arrival, access card worked, and the safe was in an accessible location. The storage container is located behind a gated/locked enclosure on the lower level.
  Corrective Action: None

- **Date of Audit:** April 20
  Location: 5700 East Tudor Road
  Weekly KMF backup CD: April 16
  Log Entry: April 20
  Findings: No issues were raised with access to the Alaska State Troopers (AST) building; exterior door was secure upon arrival, access card worked, and the safe was in an accessible location. The storage container is located behind a gated/locked enclosure on the lower level.
  Corrective Action: None

- **Date of Audit:** May 11
  Location: 5700 East Tudor Road
  Weekly KMF backup CD: May 8
  Log Entry: May 11
  Findings: No issues were raised with access to the Alaska State Troopers (AST) building; exterior door was secure upon arrival, access card worked, and the safe was in an accessible location. The storage container is located behind a gated/locked enclosure on the lower level.
  Corrective Action: None

- **Date of Audit:** June 22
  Location: 5700 East Tudor Road

Weekly KMF backup CD: June 18
Log Entry: June 22
Findings: No issues were raised with access to the Alaska State Troopers (AST) building; exterior door was secure upon arrival, access card worked, and the safe was in an accessible location behind a gated/locked enclosure on the lower level.
Corrective Action: None

- **Date of Audit:** July 24
  Location: 911 E. Cushman St., Fairbanks
  System Configuration Software Present: Yes
  Media clearly labeled: Yes
  Findings: Arrangements were made in advance for access to the Fairbanks Police Department area where the storage container is located. The container was in an acceptable/secured location and locked.
  Corrective Action: None

- **Date of Audit:** July 27
  Location: 5700 East Tudor Road
  Weekly KMF backup CD: July 15
  Log Entry: July 22
  Findings: No issues were raised with access to the Alaska State Troopers (AST) building; exterior door was secure upon arrival, access card worked, and the safe was in an accessible location. The storage container is located behind a gated/locked enclosure on the lower level.
  Corrective Action: None

- **Date of Audit:** August 24
  Location: 5700 E. Tudor Road
  Weekly KMF backup CD: August 20
  Log Entry: August 24
  Findings: No issues were raised with access to the Alaska State Troopers (AST) building; exterior door was secure upon arrival, access card worked, and the safe was in an accessible location. The storage container is located behind a gated/locked enclosure on the lower level.
  Corrective Action: None

- **Date of Audit:** September 17
  Location: 911 E. Cushman St., Fairbanks
  System Configuration Software Present: Yes
  Media clearly labeled: Yes

Findings: Arrangements were made in advance for access to the Fairbanks Police Department area where the storage container is located. The container was in an acceptable/secured location and locked.
Corrective Action: None

- **Date of Audit:** October 13
  Location: 5700 E. Tudor Road
  Weekly KMF backup CD: October 9
  Log Entry: October 9
  Findings: No issues were raised with access to the Alaska State Troopers (AST) building; exterior door was secure upon arrival, access card worked, and the safe was in an accessible location. The storage container is located behind a gated/locked enclosure on the lower level.
  Corrective Action: None

- **Date of Audit:** November 17
  Location: 5700 E. Tudor Road
  Weekly KMF backup CD: November 12
  Log Entry: November 17
  Findings: No issues were raised with access to the Alaska State Troopers (AST) building; exterior door was secure upon arrival, access card worked, and the safe was in an accessible location. The storage container is located behind a gated/locked enclosure on the lower level.
  Corrective Action: None

- **Date of Audit:** December 14
  Location: 5700 E. Tudor Road
  Weekly KMF backup CD: December 10
  Log Entry: December 14
  Findings: No issues were raised with access to the Alaska State Troopers (AST) building; exterior door was secure upon arrival, access card worked, and the safe was in an accessible location. The storage container is located behind a gated/locked enclosure on the lower level.
  Corrective Action: None

2.2 Annual Test. Per the System Backup and Recovery Procedure 400-5, paragraph 8, the procedures for the ALMR System backup and recovery shall be tested annually by the SMO, and all results of the test shall be recorded and provided to the Operations Manager.

NOTE: Real-world occurrences of, and SMO responses to, System failures shall meet the annual test requirement.

- **Date of Incident:** February 6
  Details: 0218 AM – Site Summit – Not Wide Trunking (Bouncing)
  Findings: On February 6, 2015 at approximately 0218 AM the Site Summit Site, "site controller 2" was found to be in a failed state and needed to be replaced. This was observed by Mr. Travis Conant during troubleshooting the equipment alarms for Site Summit. Due to the severity (Severity 1) this equipment replacement and configuration was placed on a scheduled maintenance for February 9th or 10th. Due to inclement weather at the site during winter months, which requires a helicopter, technicians will attempt to replace the site controller at the earliest opportunity. Initial troubleshooting efforts began on Friday morning, February 6, 2015.

  After the hardware issues were discovered during the troubleshooting, Mr. Conant discussed replacement, configuration, and repair options. Mr. Conant retrieved a spare site controller, configured with the correct version operating system, configured the securities and installed the new device. Securities lockdown and discovery of the new device were configured at the Tudor Road Master Site and tested to ensure proper operation before closing out the maintenance ticket with Motorola. The bad site controller was reported to Motorola for advanced replacement part and placed back into storage.

  The Hardware failure was not the result of a cyberattack. No data breach occurred. The tape drive was replaced and the tape media continued to be used after the drive was operational. In this event media disposal was not necessary and replaced equipment was sanitized before decommissioning IAW ALMR and DOD policies and procedures.

  Results: On February 10, 2015 the team replaced a fully functioning "site controller 2." Total site downtime was 20 minutes with the site off, to refresh the ASTRO 25 system at the site. System recovery plan successful.

- **Date of Incident:** February 20
  Details: 1444 PM – Birch Hill Master Site – One half of NICE Dual Tape Drive Bad
  Findings: On February 20, 2015 at approximately 1444 PM at the Birch Hill Master Site, one half of a two-bay "NICE Backup Tape Drive (Dual DAT 72)" was found to be in alarm and not functioning. This was observed by Mr. Andy Strait during troubleshooting the equipment and found that the NICE BACKUP Tape Dual Drive needed to be replaced. This equipment doesn't have spares at the site and needs to be replaced by the vendor. Due to the severity (Severity 2) this equipment was ordered for replacement upon arrival. In the interim, backup drives automatically picked up when the primary drives failed. Drive bay arrived February 20, 2015, and was replaced. Initial troubleshooting efforts began on Friday, February 20, 2015.

  The Hardware failure was not the result of a cyberattack. No data breach occurred. The tape drive was replaced and the tape media continued to be used after the drive was operational. In this event, media disposal was not necessary and

replaced equipment was sanitized before decommissioning IAW ALMR and DOD policies and procedures.
Results: On February 20, 2015 the team replaced a fully functioning "NICE Backup Tape Drives." Total site downtime was zero days. Awaiting advanced replacement parts for the redundant backup system and installation was 11 days. System recovery plan successful.

- **Date of Incident:** March 23
  Details: March 23, 2015, 1157 PM – Pillar Mountain – Channel 4 Power Amplifier; possible loose cable
  Findings: On March 23, 2015 at approximately 1444 PM at the Pillar Mountain site Channel 4 Power Amplifier with a possible loose cable was in alarm. This was observed by Mr. Travis Conant during troubleshooting the equipment and found that the dual isolator for Channel 4 was bad and needed to be replaced. The dual isolator required repair, replace capacitors, 5W load, and retuned to 156.0750MHz. This case had minimal impact on the entire site as a whole (Severity 3). Mr. Matt Oliver replaced the dual isolator and enabled Channel 4. Initial troubleshooting efforts began on Monday, March 23, 2015.

  The Hardware failure was not the result of a cyberattack. No data breach occurred. The tape drive was replaced and the tape media continued to be used after the drive was operational. In this event, media disposal was not necessary and replaced equipment was sanitized before decommissioning IAW ALMR and DOD policies and procedures.
  Results: On Monday, March 23, 2015, the team replaced the channel 4 dual isolator and enabled channel for use. Total site downtime was zero days. Only channel 4 was out of service until repairs could be made. System recovery plan successful.

- **Date of Incident:** March 29
  Details: 1556 PM – Auke Lake – Channel 1 Power Amplifier, Critical Failed PA, Forward Power, Bouncing
  Findings: On March 29, 2015 at approximately 1556 PM the Auke Lake "site controller 1" was found to be in a failed state and needed to be replaced. This was observed by Mr. Travis Conant during troubleshooting the equipment alarms for Auke Lake. Due to the severity (Severity 2) this equipment replacement and configuration was placed on scheduled maintenance for March 30th. Initial troubleshooting efforts began on Monday morning, March 30, 2015.

  After the hardware issues were discovered during the troubleshooting, Mr. Conant discussed replacement, configuration, and repair options. Mr. Conant retrieved a spare site controller, configured with the correct version operating system, configured the securities and installed the new device. Securities lockdown and discovery of the new device were configured at the Tudor Road Master Site and tested to ensure proper operation before closing out the maintenance ticket with

Motorola. The bad site controller was reported to Motorola for advanced replacement part and placed back into storage.

The Hardware failure was not the result of a cyberattack. No data breach occurred. The tape drive was replaced and the tape media continued to be used after the drive was operational. In this event, media disposal was not necessary and replaced equipment was sanitized before decommissioning IAW ALMR and DOD policies and procedures.
Results: On March 30, 2015 the team replaced a fully functioning "site controller 1." Total site downtime was 15 minutes during the site off to refresh the ASTRO 25 system at the site. System recovery plan successful.

- **Date of Incident:** May 6
  Details: 0955 PM – Tudor Road Master Site – KMF CryptR Failing
  Findings: On May 6, 2015 at approximately 0955 AM at the Tudor Road Master Site the KMF Server CryptR was found to be in alarm and not functioning. This was observed by Mr. Mark Jenks during troubleshooting the equipment and found that the CryptR failed and needed to be replaced. This equipment doesn't have spares at the site and needs to be replaced by the vendor. Due to the severity (Severity 1) this equipment was ordered for replacement upon arrival. Upon receiving the new CryptR it was installed and was fully operational. Initial troubleshooting efforts began on Wednesday, May 6, 2015.

  The Hardware failure was not the result of a cyberattack. No data breach occurred. The tape drive was replaced and the tape media continued to be used after the drive was operational. In this event, media disposal was not necessary and replaced equipment was sanitized before decommissioning IAW ALMR and DOD policies and procedures.
  Results: On May 9, 2015, the team replaced a fully functioning KMF CryptR module. Total site downtime was three days; no keys were being passed to radios upon re-key via over the air rekeying. Radios operated without issue on the trunking system but required manual input of keys during this period of time. Awaiting advanced replacement parts for the redundant backup system and installation was 3 days. System recovery plan successful.

NOTE: These results are also listed in the annual System Recovery Assessment and Backup-Recovery Report dated December 8, 2015.

3.0 System Log In Report

To ensure the SMO observes and reports on the established control for the Department of Defense Information Assurance Certification and Accreditation Process (DIACAP) Authority to Operate, the OMO performs unannounced, random monthly audit inspections of the System Login Report though out the calendar year.

Each user is permitted to attempt to log in three times prior to being locked out of the System. System user passwords are changed, at a minimum, every 90 days.

- **Dates of Audit:** January 20
  Inspection Period: January 11-17
  Findings: There was one instance of three failed login attempts during the period.
  - Jan 14: Zone 1 at 7:02:28pm, astrousr had three failed login attempts due to Mr. Mark Jenks applying MOTOPATCHES to ASTRO25 System.

  Corrective Action: None required for the security patching incident.

- **Dates of Audit:** February 17
  Inspection Period: February 8 - 14
  Findings: There were no instances of three failed login attempts during the period.
  Corrective Action: None.

- **Dates of Audit:** March 25
  Inspection Period: March 11 - 21
  Findings: There were three instances of three failed login attempts during the period.
  - March 19: Zone 1, 6:13:10pm, astrousr had three failed login attempts due to Mr. Mark Jenks during security patching (MOTOPATCH) at equipment in Master Site.
  - March 19: Zone 1, 7:00:00am, MATCOM had continuous failed login attempts.
  - March 19: Zone 1, 7:00:00am, Palmer PD had continuous failed login attempts.

  Corrective Action:
  - None required for the security patching incident.
  - Change password notifications were provided for the other two events.

- **Dates of Audit:** April 20
  Inspections Period: April 12 - 18
  Findings: There were two instances of three failed login attempts during the period.
  - April 13: Zone 1, 8:52am, Valdez PD had continuous failed login attempts.
  - April 13: Zone 2, 8:52am, Fairbanks DPS had continuous failed login attempts.

  Corrective Action: Change password notifications were provided for both incidents.

- **Dates of Audit:** May 18
  Inspection Period: May 10 - 16
  Findings: There were no instances of three failed login attempts during the period.
  Corrective Action: None

- **Date of Audit:** June 22
  Inspection Period: June 14 -20
  Findings: There was one instance of three failed login attempts during the period.

- June 15: Zone 1, 9:40am, Valdez PD (vpd1 and vpd2) had both console accounts notifying to change password.

Corrective Action: Change password notifications were provided and were completed on June 19, 6:27am.

- **Date of Audit:** July 27
  Inspection Period: August 16 - 22
  Findings: There were no instances of three failed login attempts during the period.
  Corrective Actions: None

- **Date of Audit:** August 24
  Inspection Period: August 16 - 22
  Findings: There were no instances of three failed login attempts during the period.
  Corrective Action: None

- **Date of Audit:** September 21
  Inspection Period: September 13 - 19
  Findings: There were no instances of three failed login attempts during the period.
  Corrective Action: None

- **Date of Audit:** October 20
  Inspection Period: October 11 - 17
  Findings: There were no instances of three failed login attempts during the period.
  Corrective Action: None

- **Date of Audit:** November 17
  Inspection Period: November 8 - 14
  Findings: There were no instances of three failed login attempts during the period.
  Corrective Action: None

- **Date of Audit:** December 14
  Inspection Period: December 6 - 12
  Findings: There were no instances of three failed login attempts during the period.
  Corrective Action: None

4.0 Information Assurance Control Reviews

In accordance with the Information Assurance (IA) Control Review Procedure 200-6, a Department of Defense (DOD) Information Assurance Certification and Accreditation Process (DIACAP) Annual Review Report shall be created which documents the findings of an assessment of a subset of implemented security controls reflective of the security categorization of the System and any threats to the System.

At the conclusion of IA Control Review activities, the IA Control Review team will provide an informal briefing of the results of the IA Control Review to the Operations Manager and the System Manager.

- **Date of Briefing:** December 16
  Findings: Mr. Wade Hill, ALMR Security Manager, provided the briefing for the annual IA Control Review, via teleconference, to the Operations Manager, Mr. Del Smith, and the System Manager, Mr. Travis Conant. Other participants were Mr. Rich Leber, Technical Advisor; Mr. Dave Rice, Security Technician; and Ms. Sherry Shafer, Documentation Specialist. The written report of findings was provided for the meeting.

  Mr. Hill noted that there were no controls which required special consideration during the annual review. He advised that all of the high impact controls were reviewed, as required, along with 24 moderate impact and 11 low impact (more than the required one third), which had not been reviewed during last year's process.
  Follow-up Actions: None

5.0 System Vulnerability Assessment

In accordance with the System Vulnerability Management Procedure 400-6, a network Vulnerability Assessment shall be performed by the Security Manager at least quarterly. Assessment results must provide Information Assurance Vulnerability Alert (IAVA) compliant assessments.

- **Date of Audit:** April 6 (covers the period of January – March)
  Finding 1: There is no fire suppression system installed within the Tudor Road facility.
  NOTE: Initial request taken from 14 May 2008 POAM - Contract CRS0425.
  Recommendation: SOA waived as an acceptable risk due to cost. Item will remain in report for historical purposes.

  Finding 2: There is no humidity control system installed at the Tudor Road facility.
  NOTE: Initial request taken from 14 May 2008 POAM - Contract CRS0475.
  Recommendation: SOA waived as an acceptable risk due to cost. Item will remain in report for historical purposes.

- **Date of Audit:** July 1 (covers the period of April – June)
  Finding 1: There is no fire suppression system installed within the Tudor Road facility.
  NOTE: Initial request taken from 14 May 2008, POAM - Contract CRS0425.
  Recommendation: SOA waived as an acceptable risk due to cost. Item will remain in report for historical purposes.

  Finding 2: There is no humidity control system installed at the Tudor Road facility.
  NOTE: Initial request taken from 14 May 2008 POAM - Contract CRS0475.

Recommendation: SOA waived as an acceptable risk due to cost. Item will remain in report for historical purposes.

- **Date of Audit:** October 1 (covers the period July – September)
  Finding 1: There is no fire suppression system installed within the Tudor Road facility.
  NOTE: Initial request taken from 14 May 2008, POAM - Contract CRS0425.
  Recommendation: SOA waived as an acceptable risk due to cost. Item will remain in report for historical purposes.

  Finding 2: There is no humidity control system installed at the Tudor Road facility.
  NOTE: Initial request taken from 14 May 2008 POAM - Contract CRS0475.
  Recommendation: SOA waived as an acceptable risk due to cost. Item will remain in report for historical purposes.

- **Date of Audit: January 4 , 2016** (covers October – December 2015)
  Finding 1: There is no fire suppression system installed within the Tudor Road facility.
  NOTE: Initial request taken from 14 May 2008, POAM - Contract CRS0425.
  Recommendation: SOA waived as an acceptable risk due to cost. Item will remain in report for historical purposes.

  Finding 2: There is no humidity control system installed at the Tudor Road facility.
  NOTE: Initial request taken from 14 May 2008 POAM - Contract CRS0475.
  Recommendation: SOA waived as an acceptable risk due to cost. Item will remain in report for historical purposes.

6.0 Conclusion

Based on each of the audit areas and corrective actions taken, the following determinations are made:

Finding 1: The SMO is following the established administration and security oversight of the System Backup media storage and the System Login procedures.

Finding 2: SOA ETS is following the established methods/controls of the Physical Security Program.

Finding 3: SOA ETS, in coordination with the Department of Transportation and Public Facilities, should plan and budget for the installation of a fire suppression system and a humidity control system within the Tudor Road facility. Loss of the Tudor Master site would be catastrophic for ALMR.

Other than Finding 3 above, there were no outstanding information assurance/security issues noted in calendar year 2015.

Alaska Land Mobile Radio Communications System

2015 Annual Business Case Update

Version 8m

January 20, 2016

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Document Revision History

Name	Date	Reason for Changes	Version
Shafer, Sherry	5/11/2009	Approved by the User Council – Final; forwarded to the Executive Council for acceptance.	3
Shafer, Sherry	6/17/2009	Accepted by the Executive Council.	3
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Shafer, Sherry	1/28/2015	Annual review/update. Approved by the User Council on January 12, 2015. Approved by the Executive Council on January 28, 2015, - final.	8
Shafer, Sherry	7/30/2015 – 1/20/2016	Annual review/update.	8a-m

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 Agreement.

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

AST: Alaska State Troopers

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.

Executive Council: the ALMR Executive Council which is 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).

Federal Communications Commission (FCC): for the purposes of ALMR, the Federal level governing body that approves the use of commercial, maritime, state, local and other agencies that are not a part of the Department of Defense or other Federal agencies radio frequency spectrum through the issuance of radio station authorizations once coordination with all potentially affected agencies has been completed. The approvals will in most cases (exceptions might be waivers or special temporary authority) be for use of a particular portion of a frequency band that has been pre-authorized through the frequency band table of allocations. In addition, the FCC maintains the communications tower registration program.

Help Desk: where repair, maintenance and programming issues/problems are reported; under the ALMR System Management Office.

Local Governments: those Alaska political subdivisions defined as municipalities in AS 29.71.800(13).

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

Mobile Radio: a radio that is installed in a vehicle and has a medium to high power output.

Municipality of Anchorage (MOA): the MOA covers 1,951 square miles with a population of 300,000 plus. 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.

Party/Parties: one or more Parties who have signed the Agreement. The Parties to the agreement are: Department of Defense - Alaska, the Alaska Federal Executive Association and the State of Alaska Department of Administration's commissioner or commissioner's designee, respectively or collectively.

Service Level Agreement: the Service Level Agreement (SLA) outlines the operations and maintenance services as required by the User Council membership for the sustainment and operation of the ALMR infrastructure. The performance metrics contained in the SLA describe the maintenance standards for the ALMR system infrastructure. ALMR cost share services are also outlined in the SLA.

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

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

System: the ALMR Communications System, as established in the Cooperative Agreement, and any and all System Design/System Analysis (SD/SA) and System Design/System Implementation (SD/SI) documents.

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

User/Member: 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 Agreement. The terms user and member are synonymous and interchangeable.

User Council: the User Council is 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 operation 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.

1.0 Executive Summary

The Alaska Land Mobile Radio (ALMR) Communications System Operations Management Office (OMO) is required to conduct an annual review/update of the ALMR Business Case. The purpose of the Business Case is to examine the ALMR Cooperative Partnership and to validate its continued existence as the appropriate solution for Alaska's interoperability needs, and whether that partnership should continue as the provider of shared, interoperable, land mobile radio (LMR) service to Alaska's emergency first responders within its coverage area.

The ALMR System:

- Achieves the highest level of the U. S. Department of Homeland Security (DHS) SAFECOM Continuum guideline for interoperability and is in the top five percent of systems nationwide
- Equipment and system operational cost are justified by the robust infrastructure, services provided and system performance
- Achieves regulatory compliance of Project 25 (P25)/Telecommunications Industry Association (TIA) 102-A standards for narrowband migration and equipment for all member agencies
- Reduced costs for narrowband migration, particularly for the State of Alaska, through Federal funding/contribution of Department of Defense (DOD) assets for System development
- Negated the need to replace legacy equipment to meet narrowband standards for local agencies by providing a narrowband compliant infrastructure for use
- Promotes economy of scale/efficiency through the use of shared spectrum and infrastructure agreements between the DOD and the State of Alaska (SOA) resulting in reduced costs for user agencies
- Aligns State/local government agencies to be eligible to receive grant funding from DHS
- Meets user agency needs for day-to-day communications and interoperability in multi-agency, multi-jurisdiction responses

The Executive Council (EC), formally chartered in 1997, has operated as a cooperative partnership, not just for narrowband migration, but also for improving public safety communications and interoperability[1] throughout Alaska. The partnership was, and still is, responsible for assessing, assembling and consolidating requirements; as well as drafting and submitting plans, agreements, budget actions, and procurement recommendations to provide a common interoperable and cost-effective LMR service that is compliant with Federal, State and local regulatory guidance and is responsive to the mission needs of all participating agencies in the State of Alaska.[2]

[1] Interoperability is defined by the FCC as "…an essential communication link within public safety and public service wireless communications systems which permits units from two or more different entities to interact with one another and to exchange information according to a prescribed method in order to achieve predictable results."
[2] Charter for the Alaska-Wide Land Mobile Radio Executive Council, April 10, 2003

Although ALMR, as initially planned, is not fully implemented; its coverage includes all major highways and over 80 percent of the State's population. Additionally, the ALMR P25, trunked, digital, Voice-over-Internet Protocol (VoIP) technology provides the capability to also pass real-time data such as maps, profiles, telemetry data and photographs, which surpasses traditional conventional systems that only allow transmission of voice.

Because ALMR is a shared system utilized by the DOD, all users enjoy the benefits of security requirements maintained at the highest level. It also provides users the ability to selectively encrypt communications, either manually or through over-the-air re-keying (OTAR). Prior to implementation, almost all law enforcement systems operated without encryption, potentially exposing sensitive transmissions to interception by non-law enforcement personnel.

ALMR has focused on developing a system that not only reflects the SAFECOM Continuum, but also provides Alaska's emergency first responders from the DOD, Federal Non-DOD agencies, SOA, tribal entities and local agencies with a capability to talk day to day on the same radios they use during catastrophic events involving multi-agency, multi-jurisdictional responses.

This capability has been tested and proven through numerous joint exercises and natural disasters, as well as daily operations. The technology employed meets Federal mandates and provides greater capabilities than the previous legacy systems. At the end of calendar year 2015, the System supported 123 agencies utilizing 20,344 subscriber units. Additionally, supported voice calls were 13,879,613 and 4,407,459 data allocations, with a less than a cumulative .06 percent system busy rate for the entire year.

Overall, ALMR has proven time after time to be the logical solution to Alaska's interoperability needs from the perspective of its operational capabilities in meeting national standards, stakeholders' requirements, interoperability training opportunities, System coverage and security, and shared cost savings benefits.

To properly assess the value and benefit gained from becoming and continuing as an ALMR member, agency decision makers need to understand the benefits derived from being on the System. These same decision makers must also ensure their funding bodies understand that any costs that may be associated with membership are justified by the level of service and interoperability achieved with other agencies and that the services these other agencies provide, via ALMR benefit the citizens of the State.

ALMR is a very effective system that greatly enhances wide area interoperable communications. Many of its perceived shortcomings are due to insufficient user training/equipment maintenance and lack of coordination between stakeholders. There is even greater potential for ALMR once all users become familiar with the System and fully utilize their radio's capabilities properly. Strengths and weaknesses of the System, as well as the need for additional ALMR training, were previously addressed in past

annual Business Case updates and also in the ALMR Strategic and Operational Plan. The need for continued funding to provide regular and agency-specific training is essential to solving those identified challenges.

The following critical, success factors validate the need for ALMR.

- **Interoperability** – the ability to seamlessly and effectively communicate both internally within the agency and externally to outside agencies on demand, in real time, when needed and as authorized
- **Efficiency of operations** – the ability to respond efficiently to day-to-day and emergency operations
- **Expanded coverage** – ability to provide communication coverage to areas not previously covered by the original legacy radio systems
- **Expanded capabilities** – the ability to provide better information through advanced technology
- **Reduced risk** – improved communications reduces the risk to the general populace and to public safety first responders
- **Shared cost savings** – the ability to reduce the costs associated with technology by sharing it with multiple agencies
- **Enhanced security** - the ability to encrypt communications, and shared cyber security across the system

The contributions of all parties involved deliver a system that is an economically sound solution, whose total benefit and capability could not be obtained separately by any major stakeholder group without considerable capital and sustainment costs. Contribution by any one of the stakeholders brings economic benefit to all others.

When the ALMR System transitioned to operational status on July 1, 2008, the ALMR Cost Share Cooperative Agreement established an approach and method for cost share by the parties. The cost share approach stated the owner of the infrastructure equipment pays for the maintenance of that equipment in accordance with the requirements defined in the Service Level Agreement (SLA). The cost share method stated the costs of the OMO and the System Management Office (SMO) would be shared 50/50 between the Federal government (meaning DOD and AFEA) and State/local government (meaning SOA and the local governments that SOA represents).

In 2012, with the divesture of the U.S. Army-Alaska (USARAK) radio frequency (RF) equipment housed in 41 SOA-owned sites to the State, the EC directed the Federal agencies, as well as State and local governments, to form a Cost Share Working Group and develop a new approach and method. The group reached consensus that the cost share should be apportioned according to infrastructure owned. The proposed method was deemed the 88/12, whereas the SOA owns 88 percent of the infrastructure and the DOD owns 12 percent. As the majority infrastructure owner, SOA would have to decide whether or not they would seek to collect funds from non-infrastructure owners (NIOs)

to offset some of their costs. The SOA, DOD, Federal Non-DOD and local agencies concurred with this approach and method.

Despite the on-going issue of cost share, the following factors remain constant:

- The cooperative partnership is a sound solution for Federal, State and local government agencies, both operationally and financially
  - ALMR is in compliance with national policy for LMR systems, which provides a robust product with notable benefits
  - Stakeholders, even those with areas of responsibility where a less robust system might be sufficient, recognize and appreciate the benefits and the perceived value as highly desirable

- The cost of separating is greater than the cost of maintaining ALMR
  - Economic analysis demonstrates that it is more valuable to all stakeholders, due to economies of scale, to retain the current ALMR cooperative partnership than to operate and maintain separate systems
  - Stakeholders derive great benefits, such as technical expertise, narrowband compliance, and greater levels of interoperability they could not achieve autonomously

This Business Case update continues to validate the shared ALMR System is still the best solution to meeting a majority of Alaska's public safety first responder interoperability needs, based on both the operational and economic benefits it provides to the users and the stakeholders, and should be sustained, maintained and fully funded throughout the System lifecycle.

2.0 Operational Benefits

The Business Case addresses the operational and economic benefits of ALMR. It does this by analyzing the capabilities agencies had before, compared to what they have now, the cost to sustain the current level of performance/technology[3], the cost to separate the System[4] and the many additional risks/costs produced by such a separation.

One such example of the benefit of the System would be the severe windstorms in September 2012, which disabled cell phone service and disrupted power for several days in the Anchorage and Matanuska-Susitna areas. During this weather event, ALMR remained online providing critical communications to first responders. If responders had to rely on their cell phones or their previous conventional systems, they could have been out of contact from several hours up to several days.

[3] Alaska Land Mobile Radio Communications System Total Cost of Ownership Study, September 18, 2008.
[4] SDID for Alaska Land Mobile Radio, July 1, 2008 and Appendix A, Alaska Land Mobile Radio System Feasibility Analysis for DOD/SOA Separation.

Other events demonstrate where a lack of System coverage also hinders first responders. In June 2013, an accidental fire caused by an artillery training exercise consumed some 85,018 acres west of Fairbanks. Evacuation of residents in the Chena River area was hampered because it is outside of the ALMR coverage footprint and conventional frequencies had to be utilized. The trunked ALMR System includes both regional and statewide incident command zones, allowing multiple agencies from multiple jurisdictions/disciplines to communicate utilizing assigned talkgroups, where they can coordinate their actions. Conventional radio operations doesn't have any such function. Limited communications such as this can hamper coordination of evacuations in an emergency situation such as this fast spreading fire, and put both citizens and first responders in danger.

Most recently, the use of ALMR during the Sockeye and Card Street fires in June 2015 provided the Division of Forestry and the Alaska State Troopers the critical interoperability needed to coordinate both firefighting efforts and to evacuate citizens in danger zones.

Another example highlighting the exceptional interoperability provided by ALMR occurred in November when an individual shot two people in Anchorage. The Anchorage Police Department, Alaska State Troopers, Federal Bureau of Investigation, Joint Baes Elmendorf-Richardson Security Forces and Alaska Railroad Police were able to coordinate their efforts with the use of ALMR resulting in the apprehension of the suspect.

Events like these continue to emphasize the need for reliable communications to maintain interoperability between Federal, State, tribal and local government public safety entities. National and State events will continue to create awareness at all levels of government that interoperability is not only required for day-to-day operations, but it is imperative for mutual aid and emergency task force operating environments.

The State, as the primary infrastructure owner, has been participating in open, equitable discussions among leadership and stakeholders and diligently working together with agencies and jurisdictions to ensure a modern, effective and efficient, shared interoperable LMR system is available.

2.1 National Standards

Members of the SAFECOM Emergency Response Council (ERC) have identified the need for interoperability nationally. Likewise, the Department of Homeland Security (DHS) Office for Interoperability and Compatibility (OIC) has stressed the importance of implementing and supporting an effective interoperable communications system which:[5]

- Saves and protects citizens
- Saves and protects emergency responder lives

[5] Department of Homeland Security S&T Stakeholders Conference, June 2, 2008

- Increases emergency responder effectiveness and coordination
- Improves response times in multi-jurisdiction responses
- Reduces property loss

In the interest of nationwide interoperability and spectrum efficiency, Congress mandated in the National Telecommunications Authorization Act of 1992, that the Federal Government foster the development of, and standards for, narrowband LMR systems operating in the 162 – 174 MHz band.[6]

In 1995, the Federal Communications Commission (FCC) adopted a regulatory strategy, and a narrowband channel transition plan, to promote more efficient use of the existing private land mobile radio (PLMR) spectrum allocations below 800MHz.[7] Only equipment capable of operating on a channel bandwidth of 12.5kHz or less, or equipment which operates on a channel bandwidth of up to 25kHz if certain narrowband efficiency standards are met, would be accepted.[8]

To facilitate mandated migration to narrowband radio technology, the DOD (through Alaskan Command) formed an Alaska-wide Federal LMR Executive Council in September 1995. Membership was initially only open to federal agencies in Alaska;[9] however, in 1997, the Commander, Alaskan Command stated his intent to seek a partnership with State and local agencies in order for the DOD to more effectively perform one of its key missions: Defense Support of Civilian Authorities. Therefore, the Alaska-wide Federal LMR Executive Council expanded its membership to include the State of Alaska and the Alaska Municipal League.[10]

2.2 The Case for Interoperability

The safety of the general public should always be high priority. Ultimately, the public expects their lives and property to be protected by all levels of government – local, tribal, State, or Federal – without distinction as to who responds to their needs.[11] A key element to successfully meeting that priority in responding to incidents at all levels is a solid interoperable communications infrastructure.

Since its formal chartering in 1997, Federal, State, tribal and local agencies have operated as a cooperative partnership, not just for narrowband migration, but also for

[6] National Telecommunications Act of 1992, P.L. 102-538 (IRAC Doc. 29764)
[7] NEWSReport No. DC 95 86, PR Docket 92-235, FCC 95-255, June 15, 1995, ¶ Para 1, 1-3 http://www.fcc.gov/Bureaus/Wireless/News_Releases/1995/nrml5026.txt
[8] Report & Order and Further Notice of Proposed Rule Making (FCC 95-255), June 15, 1995
[9] Charter for the Alaska-Wide Land Mobile Radio Executive Council, September 19, 1995
[10] Memorandum of Understanding Between Department of Defense, Alaskan Command, State of Alaska, Federal Executive Association of Alaska, and Alaska League of Municipalities
[11] *See* http://www.ncjrs.gov/pdffiles1/nij/211512.pdf

improving public safety communications and interoperability[12] throughout Alaska. The partners created a broad charter of duties and responsibilities, including:

> "…assessing, assembling and consolidating requirements, drafting and submitting plans, agreements, budget actions, and procurement actions to provide a common interoperable and cost effective LMR service that is compliant with federal, state and local regulatory guidance and is responsive to mission needs of all participating agencies in the State of Alaska." [13]

These key decisions were integral to the initial Business Case for building, operating, maintaining, and funding a cost-burden shared, standards-based, wide-area, trunked land mobile radio system.[14] Interoperable communications allow emergency response agencies to communicate across disciplines and jurisdictions. Without interoperable communications, and the ability to exchange voice and/or data with one another on demand, in real time and when needed among the police, fire, emergency medical services (EMS), transportation and other needed emergency responders, the lives of citizens and practitioners are potentially at risk.

Maintaining the ALMR communications infrastructure requires the same level of commitment, support and funding from public leaders, as does the building and maintaining of roads or bridges. And just like State roads and bridges, sustainable interoperable communications infrastructure requires continual upkeep, maintenance and improvements. Funding bodies, especially at the State level, must realize the importance of interoperable communications and address these costs, as an inherent part of the annual budget.

2.3 Stakeholder Requirements

Interoperability requires a certain amount of shared management, control and policies and procedures. It requires policymakers across jurisdictions to work together for the common good – to plan, fund, build, operate and maintain interoperable public safety communications systems.[15]

A successful strategy for improving interoperability must also be based on user needs.[16] Therefore, continually identifying and validating stakeholder operational requirements for the ALMR System, is key to updating the Business Case. The critical success factors are essentially the same for each of the entities. However, they vary in importance from agency to agency. ALMR is not everything to every agency in Alaska

[12] Interoperability is defined by the FCC as "…an essential communication link within public safety and public service wireless communications systems which permits units from two or more different entities to interact with one another and to exchange information according to a prescribed method in order to achieve predictable results."
[13] Charter for the Alaska-Wide Land Mobile Radio Executive Council, April 10, 2003
[14] Alaska Land Mobile Radio Executive Council, "Interoperability Plan for the State of Alaska," dated April 2003.
[15] *See* http://www.ncjrs.gov/pdffiles1/nij/211512.pdf
[16] Department of Homeland Security S&T Stakeholders Conference, June 2, 2008

now, nor may it ever be, but from both an interoperability and economical standpoint for the Alaska first responder community, it is the solution that meets stakeholder needs.

The Cooperative Agreement sets out the terms according to which the System will be governed, managed, operated and modified. The ALMR System is managed as a consortium under authority and oversight of the EC. The Operations Manager performs day-to-day management functions on behalf of the EC. The OMO provides guidance and oversight of the System in cooperation and coordination with the User Council (UC),[17] which is responsible for all operations and maintenance (O&M) decisions, and for fulfilling other duties and tasks as set out in the Cooperative Agreement.[18]

Stakeholder requirements are addressed through support provided by the governance bodies, operations and maintenance organizations and infrastructure owners.

- Governance support includes:
  - Executive Council - chartered to define, develop and coordinate an implementation, migration, operations, maintenance and management plan to provide a cost shared LMR Project 25/TIA102-A standards based communications trunked and conventional infrastructure encompassing participating Federal, State, and local users within Alaska[19]
  - User Council - responsible for creating and maintaining a collaborative user-based management system to establish policy and operational procedures, and to operate and maintain the System under the oversight of the EC[20]

- Operational support includes:
  - Operations Management Office - oversees day-to-day operations of the ALMR shared infrastructure; coordinates and performs a range of operational and administrative activities in direct support of delivering 24/7 ALMR services; develops and administers strategic and operating plans; develops and maintains relationships with program managers of the ALMR stakeholders and with current and prospective ALMR users; and provides administrative support, reports, and recommendations to the UC and EC[21]
  - System Management Office - provides the technical expertise to accomplish wide-area system management, system maintenance and technical support, network operations and support, radio frequency spectrum management support and security and information assurance[22]

[17] ALMR Cooperative Agreement, Article 6, November 21, 2007
[18] ALMR Cooperative Agreement, Article 8, November 21, 2007
[19] Charter for the Alaska Land Mobile Radio Executive Council, January 28, 2008
[20] Alaska Land Mobile Radio Communications System User Council Charter, December 29, 2006
[21] Operations Management Office (OMO) Customer Support Plan (CSP), January 3, 2008
[22] System Management Office (SMO) Customer Support Plan, February 6, 2008

- Technical support includes:
  - Equipment Maintenance - operations and maintenance services associated with the ALMR shared infrastructure were developed at a level to support a system that is operational at least 99.999% of the time.[23]
  - Circuit Usage - primarily SATS circuits, which are also utilized by ALMR
  - System Updates - expected to be released approximately every year through 2022, which is currently the projected System lifecycle. ALMR migrated to Motorola 7.13 software platform on August 6, 2013.

2.4 Capabilities

Any system is only as good as the capabilities it offers. The following key points were provided in the initial Business Case and still apply today. They provide a comparison in functionality and features between the legacy conventional systems and the ALMR System.

- Legacy Conventional System
  - Different radios/frequencies/bands
  - Limited standards for technology/equipment
  - Limited funding/lack of available replacement parts
  - Limited/fragmented planning/cooperation among local, State and Federal agencies
  - Limited/fragmented radio spectrum available to public safety
  - SAFECOM Continuum Technology Level 1 or 2[24]
  - Inconsistent encryption capabilities across different agencies (manual re-keying required additional dedicated equipment)
  - No data capabilities; paging available[25]
  - Limited redundancy; constrained by a single radio channel[26]
  - Inconsistent security applications/standards[27]
  - Constricted wide area coverage; when within range of a single repeater[28]
  - Non-compliant with federal mandates[29]

- ALMR System
  - Single system supporting interoperability at all levels
  - Complies with Homeland Security SAFECOM Continuum guidelines for Interoperability[30]
  - Oversight and management of Alaska's Public Safety radio spectrum asset

[23] Service Level Agreement, February 26, 2008
[24] Alaska Land Mobile Radio Total Cost of Ownership Project, Market Strategy Group, LLC, February 2005
[25] *ibid*
[26] Alaska Land Mobile Radio Total Cost of Ownership Project, Market Strategy Group, LLC, February 2005
[27] *ibid*
[28] Alaska Land Mobile Radio Total Cost of Ownership Project, Market Strategy Group, LLC, February 2005
[29] *ibid*
[30] *See* http://www.safecomprogram.gov/NR/rdonlyres/65AA8ACF-5DE6-428B-BBD2-7EA4BF44FE3A/0/Continuum080106JR.pdf

- Regulatory compliance of P25/TIA 102-A standards for narrowband migration/equipment
- Reduced cost for State and local governments for narrowband migration through federal funding/contribution of DOD assets
- Provides for wide area coverage along major highways in the state[31] at a significantly reduced cost over an independent approach
- Provides Federal/State infrastructure for local government use
- Promotes economy of scale/efficiency through shared spectrum/infrastructure between DOD and the State of Alaska; reduced capital/operating costs
- Maximizes/optimizes management/use of PLMR spectrum; increased capability for interoperable communications
- Standards-based P25 technology aligns state/local government agencies to receive grant funding from the DHS
- Flexible, scalable, and adaptable communication infrastructure; incorporates/provides use of latest wireless digital solution
- SAFECOM Continuum Technology Level 5
- Advanced Encryption Standards (AES); able to utilize multiple encryption keys[32] (OTAR on existing trunk infrastructure)
- Secure data with wide/personal/local area network capabilities[33]
- Available redundancy; multiple communications channels exist[34]
- Security certification and accreditation provided at the DOD Mission Assurance Category II level (mission essential system carrying sensitive information whose degradation or loss is unacceptable)
- Availability of multiple equipment vendors[35]
- Improved voice quality[36]
- Enhanced functionality including data and other capabilities[37]

These benefits and functionality were not available to all public safety agencies with the previously existing conventional systems. The shared system approach makes these benefits available to all the participants in the ALMR partnership. Transition from many individual conventional systems to the ALMR shared system has had many positive impacts for agencies.

Additional capabilities include:

- Expanded Coverage - level of coverage provided by ALMR is possible through the use of the State's existing microwave infrastructure. This infrastructure is the State's network backbone for data communication and must be maintained and supported regardless of the ALMR System. The potential exists for the ALMR

[31] *ibid*
[32] Alaska Land Mobile Radio Total Cost of Ownership Project, Market Strategy Group, LLC, February 2005
[33] *ibid*
[34] *ibid*
[35] P25 Systems Training Guide, Daniels Electronics, 2007
[36] *ibid*
[37] *ibid*

System to expand further into less populated areas of Alaska by adding additional sites to the network backbone.

- Expanded Capabilities - the ALMR System allows for data transmission (9600 baud rate) including maps, profiles, telemetry data and photographs. This information expands the capability and efficiency by allowing emergency responders to react to new information as it becomes available.
- Consolidated Dispatch Centers - anyone can potentially be dispatched from any location. Due to this capability/cost of modern dispatch equipment, consolidation of smaller dispatch functions into more regional dispatch centers occurred. However, agencies still maintain their day-to-day talkgroups.
- Standardized System O&M - universally adopted and, to a degree, centralized. The Cooperative Agreement calls for outsourced O&M independent of the stakeholders to prevent a conflict of interest, and to ensure equitable treatment of all agencies operating on ALMR. This is accomplished through the contracted OMO and SMO in accordance with the System requirements, as stated in the SLA.[38]
- Security Improvements - because ALMR is a shared system, the security requirements at the highest level must apply to all users. Anti-virus software and other safeguards must exist on all devices that attach to the ALMR network. ALMR also provides the ability to selectively encrypt communications, either manually or through OTAR.

3.0 Economic Feasibility

3.1 Efficiency of Operations

A seamless communication infrastructure between, and within, agencies provides real-time response capabilities not typically available with a conventional system. Inter-agency response activity on a conventional system could require multiple radios swapped between agencies, programming of shared channels, relaying information to responders on the ground by switching radios and re-transmitting, or relaying the information in person, any of which could result in delays and the potential for injury or the loss of life. With ALMR, all responders are able to share information in real time with the same radio they use on a day-to-day basis.

3.2 Shared Cost Savings

The majority of ALMR capital costs have already been paid. They include the network infrastructure, State of Alaska Telecommunications System (SATS) sites, and the trunked RF equipment. There are currently 83 ALMR sites, 12 Anchorage Wide Area Radio Network (AWARN) sites and 2 transportable communications systems, providing coverage to the population centers, major roadways and portions of the Marine Highway in Alaska. If the System had been completed, as originally planned, there would have

[38] The ALMR Service Level Agreement was developed jointly by the User Council and the Project Team and was approved by the Executive Council on August 21, 2008

been a total of 105 fixed ALMR sites, which includes the 15 AWARN sites. Costs associated with the on-going support and maintenance of the System will continue to exist.

Currently, support and maintenance costs include:

- Executive oversight and change control
- Operations and system maintenance management of network infrastructure
- Expanding coverage (capital costs)
- System security
- New technology research/testing
- Updating software/infrastructure equipment (funded through either O&M or capital costs)

3.3 Cost Benefit

This section utilizes data gathered from both the 2005 and 2008 Total Cost of Ownership (TCO) studies, an Economic Analysis conducted in 2008, and a Feasibility Study conducted in 2011. It compares the cost of continuing to operate and maintain the ALMR System versus dismantling the System and creating separate systems. It also provides a list of intangible System benefits that exist because of the shared system approach.

In the past, three cost benefit alternatives were identified:

- Agencies fund, implement, operate, and maintain their own independent infrastructure, as in the past
- Federal, State and local governments cooperate to share a standards-based fixed infrastructure
- Agencies can purchase a few ALMR radios to use when required and continue to maintain their own in-house infrastructure

ALMR was chosen for the cost benefits identified in the second alternative. The following historical information from the listed studies confirms the rationale behind this decision.

3.3.1 2005 TCO Study

The first TCO Study was completed in February 2005, was completed by Market Strategy Group LLC, who interviewed more than 60 organizations and collected not only quantitative data on these organization's current LMR costs, but also qualitative data regarding issues with the conventional network.[39]

The aggregated unit cost per subscriber for the conventional LMR network for the organizations interviewed was $40. The study found that the DOD had the lowest per unit costs due to their economies of scale in procurement and usage, the limited area

[39] ALMR Total Cost of Ownership (TCO) Detailed Briefing Report, Market Strategy Group, March 2005

their network covered, and a strict adherence to LMR policies and procedures. Trunked networks are typically more expensive on a per unit basis because these networks contain more modern technology and have enhanced feature functionality.[40]

In addition to the costs for conventional systems already in place within Alaska, the 2005 study benchmarked 13 state trunked systems to gain a comparative baseline for O&M and subscriber unit costs. The associated fees were all based on trunked networks and many of the networks did not cover the subscriber unit O&M, as it is considered the responsibility of each individual agency. Additional fees were generated from activation and re-programming and extra charges for associated services such as: wide-area roaming, inter-connect, and direct inward dialing (DID), among others. These amounts exclude any data related charges.

3.3.2 2008 TCO Study

In July 2007, the Executive Council commissioned a second TCO with two primary objectives: 1) to document all costs associated with System build out, implementation, and cutover; and 2) to document the projected future O&M costs for the remaining lifecycle of the ALMR shared system infrastructure. The total build out cost was $195 million.

Based on the projected costs identified in the study, in August 2008 the EC agreed upon a cost share approach and method, wherein infrastructure owners pay to maintain their infrastructure and all other costs will be shared equally based on subscriber units registered on the System.[41]

As previously noted, in CY2012/FY2013, with the divesture of RF equipment by USARAK, a Cost Share Working Group was formed made up of SOA, DOD, Federal Non-DOD and local representatives for the ALMR System. Led by the SOA Director of ETS, they were charged with coming up with an agreed upon method and approach for sharing costs of shared ALMR services. The decision of the group was that owners would continue to pay for the infrastructure they owned, and they would share common services based on the percentage of the infrastructure they own. Costs for shared services were split 88/12 with the SOA responsible for 88 percent based on the number of sites they owned and the DOD would be responsible for 12 percent. Non-infrastructure owners would pay based on negotiations with the SOA.[42]

The Executive Council was presented a briefing containing this information at their April 19, 2012, meeting and voted to move the approach and method forward to their respective represented agencies for consideration. At the November 29, 2012, meeting the approach and method were approved by the Executive Council for implementation starting in State FY14 and Federal FY13, effective beginning July 1, 2013.[43]

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[40] *ibid*
[41] Alaska Land Mobile Radio (ALMR) Cost Share Update briefing to the Executive Council, August 21, 2008
42 Cost Share Working Group Closeout Briefing, given by Mr. Pat Shier, 4/19/2012.
43 November 29, 2012 Executive Council Meeting Minutes, dated January 27, 2013.

3.4 Economic Analysis

The Alaska Land Mobile Radio (ALMR) DOD Project Manager contracted Tecolote Research, Inc., in 2008, to perform an Economic Analysis (EA) of the ALMR enterprise. The scope of the EA was to examine two ALMR alternatives: 1) keeping the cooperative intact, or 2) dividing it into separate entities. This was a non-advocate analysis to compare the benefits and disadvantages, cost and non-cost factors (both tangible and intangible) of these two alternatives**.** The analysis included positive and negative aspects of both alternatives from each major stakeholder's perspective.[44]

Additionally, the survey was intended to gather information to be shared with the DHS, Office of Emergency Communications (OEC) to determine whether ALMR compliance with Presidential and DHS directives is, in fact, beneficial to agencies in responding to day-to-day and emergency situations, and to show the economic impact associated with that compliance.

An EA survey was distributed in October 2008 to key ALMR stakeholders in order to gather data on the value of ALMR to first responder agencies on the System and the potential for further enhancing its value to user agencies.[45]

Comments from stakeholder interviews indicated:

- Building separate capabilities provided by ALMR would cost more and work much less effectively. [46]
- There are tremendous benefits with ALMR technology and the interoperability it affords them. [47]
- The system is better now and cheaper than the legacy system. [48]
- Interoperability levels achieved by the ALMR consortium model are not achievable with independent systems[49].
- Independent systems could not be built or maintained with the same cost efficiencies generated by the consortium model[50].
- Splitting ALMR would eliminate or complicate interoperability between MOA and State law enforcement agencies and emergency response units, which would be detrimental to public safety in fringe areas around Anchorage where cooperation is often essential.[51]

[44] Tecolote ALMR Stakeholder Interview Letter, distributed by Mr. Del Smith via email, 10/8/2008 3:37 PM
[45] ALMR Economic Analysis participant stakeholder email, sent Wed 10/8/2008 3:37 PM
[46] ALMR Stakeholder Interview, USARAK G6, Colonel Darin Talkington, October 15, 2008
[47] ALMR Stakeholder Interview, 354 Communications Squadron, Eielson AFB, Major Amy Osterhout, October 16, 2008
[48] ALMR Stakeholder Interview, Drug Enforcement Agency, US Department of Justice, Mr. Fred Smith and Mr. Adrian DeLuna, October 20, 2008 and October 24, 2008 (respectively)
[49] ALMR Stakeholder Interview, Alaska Department of Administration, Deputy Commissioner Rachael Petro with Commissioner Special Assistant Carol Beecher, November 13, 2008
[50] ALMR Stakeholder Interview, Alaska Department of Administration, Deputy Commissioner Rachael Petro with Commissioner Special Assistant Carol Beecher, November 13, 2008
[51] ALMR Stakeholder Interview, Traffic Department, Mr. Trygve Erickson, and Assistant City Manager, Ms. Heather Handyside, October 14, 2008

- Splitting ALMR will cause degradation to interoperability even for the MOA. It will be more of a challenge to provide training whereas now it's easier with everyone using the same type of equipment[52].

An Independent Validation for Cost Reasonableness (IVCR) was also conducted as part of the Economic Analysis and validated that the cost of ALMR was reasonable when compared to two other benchmark systems: Pacific Land Mobile Radio (PLMR), in Hawaii, and Fort Lewis Land Mobile Radio in Washington State. It concluded, "The robustness of the system, the services provided, and the cost performance ratios validate that ALMR costs are reasonable." The total benefit and capability could not be obtained separately by any major stakeholder group when considering the estimated capital and sustainment costs.[53]

3.5 Separation Study

In addition to the operational considerations, a rational decision of whether or not to continue a particular course of action also requires an examination of alternatives from a technical perspective. In this case, the two logical alternatives are either continuing with the ALMR System as currently implemented, or dissolving the partnership and returning to separate systems.

Motorola® was also tasked in 2008 with conducting an analysis that examined the pros and cons of these two alternatives and the costs associated with each.[54]

The separation analysis discussed numerous options for each entity and provided a recommendation based on rating each alternative to determine the best possible solution considering both technical feasibility costs and operational criteria.

In the end, it was determined to separate ALMR would cost all stakeholders an additional $120+ million in new equipment costs over the cost of the current investment, and more than double the annual cost of current O&M.

The overarching recommendation was to retain the ALMR System as presently configured and operated.

3.6 ALMR Feasibility Study

In 2011, the SOA Legislature requested an independent study[55] of ALMR to evaluate the operational and economic impact of the U.S. Army Alaska (USARAK) equipment divestiture. Additionally, an assessment of recent advances in technology was made to

[52] ALMR Stakeholder Interview, Traffic Department, Mr. Trygve Erickson, and Assistant City Manager, Ms. Heather Handyside, October 14, 2008
[53] Alaska Land Mobile Radio (ALMR) Economic Analysis (EA) Executive Summary, 5 March 2009, Tecolote Research, Inc., Pages 7-8.
[54] Alaska Land Mobile Radio System Feasibility Analysis for DOD/SOA Separation, June 3, 2008
[55] ALMR Feasibility Study, State of Alaska, October 2011, World Wide Technology, Inc.

determine if feasible alternatives to ALMR exist. The evaluation also included an approximate cost/benefit analysis.[56]

The study also noted that although the System is shared by numerous agencies which all have common public safety responsibilities, all agencies had communications systems prior to ALMR that met their daily operational needs.[57]

Utilizing that information, agencies were asked how the use of ALMR for day-to-day operations, emergency response and law enforcement had affected their operations and what the effect would be should ALMR interoperability be lost. Responses resonated to the effectiveness and benefit of the interoperability, as well as the cost benefit for everyone involved by having a combined system approach.

Comments included:

- ALMR has greatly increased the ability to interoperate. Continued funding for communications in that area must be secured as the legacy system has a very limited coverage area. This is a big public safety issue to the residents of Alaska.
- ALMR is used together with alternative systems, which provide extended coverage for remote regions in AK. Reducing the existing ALMR coverage area would create a severe safety issue for law enforcement personnel.
- Because of the shared system infrastructure and shared spectrum approach, a separation of the system would require each agency to completely replace their entire portion of the system with an independent stand-alone replacement. The loss of operational capability most important of which is interoperability is severe and significant. There is a cost for interoperability but not having the interoperability when it is needed has historically proven to be much more costly.
- We recently investigated the operational and economic feasibility of using a conventional system in a similar fashion to ALMR (talkgroups for dispatch and tactical response). This would only be possible with a significant capital investment to purchase the new equipment and to reprogram the radios.
- Our legacy system is not used anymore, but could possibly serve as a backup. However, the legacy system is not compliant with the FCC narrowband mandate and costly upgrades would have been necessary at some point. If ALMR became unavailable, a reduction in workforce would have to be considered in order to maintain basic communications.
- Without ALMR, the capability for interoperations between the State of Alaska and our city would be diminished and the encryption capability would be lost
- ALMR provides critical interoperable and long distance communication ability. Without ALMR, the ability to reach airports and mass transit locations would be virtually eliminated when standard lines of communication are inoperable.[58]

[56] Ibid, page2
[57] Ibid, page 11
[58] ALMR Feasibility Study, State of Alaska, October 2011, World Wide Technology, Inc., page 13-18

3.7 Benefits of the Shared System Approach

The ALMR System build-out was funded by the infrastructure owners based upon their independent requirements. A Joint Project Team was established to collaborate and coordinate the build-out to be mutually beneficial for the infrastructure owners while executing it in a fiscally and legally correct manner.

The DOD negotiated with the SOA to place DOD LMR infrastructure into SOA communications shelters and towers on SOA real property, in exchange SOA would operationally benefit from the DOD capital investment in infrastructure, which would replace the State's infrastructure which was 30 years old and at its end of life and no longer supportable.

Aside from the significant increase in interoperability, the DOD gained coverage along major State roadways, at the cost of procuring, installing and maintaining LMR equipment while benefitting from the SOA shelters, towers and microwave backbone and the State benefitted by not having to incur a large initial capital investment to replace the end-of-life equipment in 41 State owned sites, while also gaining operational improvements in communications capabilities, coverage and interoperability.

The SOA, Federal and Municipal partners recognized the necessity for an interoperable communications system for all-hazard emergency response. The lack of interoperable communications has historically proven to be a major issue of any catastrophic event, hindering disaster response and relief efforts. Such a situation not only increases recovery costs, but also endangers the safety of first responders and citizens.

As a result of these considerations, the ALMR Communications System was designed to facilitate the FCC-mandated migration to narrowband radio equipment and to improve public safety communications across all jurisdictions. Through the ALMR cooperative partnership, the State of Alaska was able to offset substantial capital expenses for necessary equipment upgrades. In its present form ALMR is based on an LMR infrastructure compliant with FCC narrowband requirements and is designed to enable the highest degree of interoperability as defined by the SAFECOM guidelines.[59]

To properly judge the merits of the shared System, and to further validate the findings of the TCOs, the EA, the Separation Study and the Feasibility Study, tangible and intangible benefits can be considered.

- Tangible benefits include:
  - Shared frequencies/infrastructure
  - 24/7 operational availability/reliability
  - Remote monitoring
  - Seamless interoperability
  - Dedicated and priority talkgroups

[59] ALMR Feasibility Study, State of Alaska, October 2011, World Wide Technology, Inc., page 2-3

  - Highly-reliable, redundant network
  - Newest technologies available to all users (when updated as prescribed)
  - Expanded coverage areas along the roadway; minimum dead zones
  - Agencies operate day-to-day as they would in an event/crisis
  - Compliance with national framework for interoperability
  - Centralized points of contact for System issues
  - Higher security levels than legacy conventional system
  - Fully-deployable site capability with the North and South Area Transportable units
  - Third party preventive maintenance

- Intangible benefits include:
  - Facilitates implementation of National Incident Management System (NIMS)
  - Coordinated response through created talkgroups for specific incidents
  - Denial of access for specific subscriber IDs; disable lost or stolen units
  - End-to-end radio transmission encryption capability; secure statewide operation
  - OTAR; rapidly provides secure operational keys to users in the field
  - Compliance with federal interoperability/technology directions; positions users for eligibility of federal grant funding
  - Backward compatible with legacy conventional systems; provides for a gradual transition to the full P25 digital, trunked, shared system
  - Interoperability with disparate systems (inside/outside the ALMR footprint) through gateways
  - Ability to evolve as technology advances through updates to system/subscriber unit software
  - Positioned to increase communication capabilities with other jurisdictions as Inter-RF Sub-system Interface (ISSI) technology evolves
  - Agencies have opportunity for input; System operated through the EC, UC, and third party O&M contractors
  - Inability for typical off-the-shelf scanner to receive the ALMR digital signal; difficulty for monitoring by the general public (mitigates law enforcement concerns short of encryption)
  - Interoperability across jurisdictional lines at all levels of government
  - Meets SAFECOM Continuum Technology Level 5 standard for non-proprietary shared system
  - Most robust/mature capability; top five percent of US in interoperability capability[60]

4.0 Risks and Limiting Factors

4.1 Operational Risks

[60] ALMR Self Assessment performed at http://www.safecomprogram.gov/SAFECOM/selfassessment, 12/2/2008

The inability to interoperate and have real-time communications between responders during an emergency increases the risk to emergency responders, the public, personal property and natural resources. Therefore, risk reduction is a key factor for most agencies. Clearly, the more effectively emergency responders can communicate situational information and resource needs, the greater the ability to reduce the risk to all.

4.1.1 Loss of interoperability

Numerous after-action reports from major incidents throughout the history of emergency management in our Nation have cited communication difficulties among the many responding agencies as a major failing point and a continued challenge to policymakers. Congress and the Administration recognized a successful response to a future major incident, either a terrorist attack or natural disaster, requires a coordinated, interoperable response by both public and private safety, health and emergency management agencies at Federal, State, tribal, territorial, regional, and local levels.

From the beginning, the ALMR partners recognized the benefits of interoperability and the cost efficiencies of a shared system.

The technology involved in ALMR, coupled with deliberative planning (i.e. development of a statewide ICS zone, six regional ICS zones, a statewide OP zone, talkgroup sharing agreements, and the implementation of NIMS) ensures a coordinated and efficient response, when properly used. ALMR technology and deliberative planning place powerful tools and resources at the disposal of the majority of Alaskan first responders in a crisis and in their day-to-day operations. A retreat from the current capability would severely hamper any multi-agency, multi-jurisdiction response to incidents in Alaska.

4.1.2 Failure to Meet the FCC Mandate

In December 2004, the FCC mandated that all private LMR users operating below 512 MHz move to 12.5 kHz narrowband voice channels and highly-efficient data channel operations by January 1, 2013. This migration complemented the NTIA mandate for Federal agency migration to 12.5 kHz narrowband operation that went into effect January 1, 2008.

Although ALMR members are in compliance with the mandates, any public safety agency not on ALMR must aggressively develop a strategy to meet the narrowband deadlines, if they have not already done so, to avoid cancellation of existing wideband FCC authorizations.

4.1.3 Training

With increased capability and capacity, comes the need for established processes, procedures, and training. The typical legacy radio is conventional, has 12-16 channels

and is fairly simple to use. The subscriber units used on ALMR can contain hundreds of talkgroups spread across multiple zones (make/model dependent). For these reasons, far more radio usage and operational training is required for each radio user. Failure to address this training has manifested itself repeatedly during joint exercise when new radio users try operating on the System.

Agencies at all levels of government have been encouraged to take advantage of the training currently being funded by the SOA to train their personnel on subscriber use and protocols (changing channels, encryption, and locating Regional and Incident Command Zones) prior to issuing them an ALMR radio. A $5K radio in the hands of someone who doesn't know how to properly use it is tantamount to handing them a brick and expecting them to call out on it.

4.2 Economic/Political Risks

Separate studies were conducted in 2002[61] and 2004[62], which identified critical risk factors. Although several of those factors have been mitigated, others still exist today, as demonstrated by the 2012 divestiture of the USARAK LMR RF equipment.

The State Legislature has expressed their desire that local agencies participate in the ALMR shared costs to reduce the State's costs. It is important that the User Council and the Executive Council strive to communicate the benefits derived from interoperability between all agencies on ALMR to insure the safety and security of the Alaskan public. If we are not successful with this endeavor, and local agencies are required to contribute at a level that is unacceptable to them, we risk losing their participation.

It is important to maintain the ALMR partnership not only with the infrastructure owners, but also with the local government and volunteer emergency services, to insure 24/7 continuity of operations during emergencies and day-to-day operations. We can only achieve this if there is adequate funding and an acceptable approach to a Cost Share Plan.

Some examples of possible long-term funding solutions that would mitigate the impact on agencies participating in the cost share could be as simple as adding small fees to driver's licenses or an additional tax on fuel sales or phones, although these may present some political risk. However, these types of actions, or similar measures used by other states, merit consideration as the Administration and the Legislature seek to establish long-term funding strategies to support public safety communications in Alaska.

Currently, the contracted services of the Operations Management Office and the System Management Office are funded 88/12 between the State and the DOD through

[61] ALMR Communications Plan Overview, October 5, 2002
[62] ALMR Risk Assessment, 5 Star Team, December 2005

June 30, 2016. Each is responsible for developing a method to apportion the costs among the agencies they represent as ALMR Cooperative partners and for collecting funds to be applied to their respective portions of the contracts.

The State has developed a process by which funds from non-state agencies and organizations can be received and applied to ALMR shared costs. Previously, the process was a work in progress and, as such, not all agencies were able to fully participate in the cost share. Transfer of funds between DOD agencies has been occurring on a regular basis with regard to ALMR cost share.

It is critical that the ALMR partnering agencies maintain a long-term, adequately funded maintenance and operations strategy for ALMR. As previously experienced with the SATS, underfunding, poor maintenance practices and simple neglect could lead to degradation in the quality and level of performance of the System. This is not an acceptable risk to the Department of Defense and they have expressed their willingness to disband the partnership, if the System is not properly maintained. This would have disastrous consequences for all involved.

4.3 Technology Cost Risks

The expanded capabilities of technology like the ALMR system bring an increased cost. Radios that operate on a conventional system can cost from $500 to $1,000, while radios on a trunked system used to cost between $2,000 and $5,000. However, with the increase of the number of manufacturers offering P25-capable radios, costs for trunked radios have decreased. Currently, there are eight manufacturers who have completed an Acceptance Test Procedure (ATP) and have subscribers approved to operate on ALMR, thus allowing agencies a wider variety of price ranges and manufacturers from which to choose.

Unfortunately, more sophisticated equipment in the field also potentially results in higher maintenance costs. Systems of this nature are expensive to build and expensive to maintain and would be particularly onerous for a single agency. This makes the continued ALMR shared partnership approach the logical option.

Like any information technology (IT) system, ALMR software requires periodic updates. Motorola® supports backwards compatibility and pre-tested software patches for up to five System updates.

In 2013, ALMR underwent a System software update and currently operates on the 7.13 platform. However, funding still remains an issue unless the partnering agencies can agree upon funding at predetermined increments throughout the System lifecycle, known as System Upgrade Assistance (SUA).

Risks on the immediate horizon include the Gold Elite consoles, Quantars® and the XTS® and XTL® subscribers, which are now all approaching end of life. A plan must be put in place to replace these units before they are no longer supportable.

Long-term evolution (LTE), although originally touted as the “next best thing” has yet to be proven as the end all, be all for public safety first responders. Current thinking, with regard to the use of LTE technology by first responders, envisions it as augmenting LMR systems, not replacing them.

While the planned National Public Safety Broadband Network (NPSBN), aka FirstNet, utilizing LTE may allow for real-time data transmissions and streaming media, it will not take the place of the current LMR systems in the near term for mission critical voice transmissions. As stated above, LTE will initially be used to augment current LMR technologies. The full implementation of the NPSBN utilizing LTE still remains a moving target and could be as far away as ten years. Therefore, the operation and maintenance of current LMR systems must be maintained and updated at appropriate intervals.

4.4 Other Risks

Up to this point, lack of a fully implemented long-term funding solution between the cooperative partners has been one of the greatest risks to the System and year after year, it has failed to be addressed. Underfunding of the System in FY15 and again in FY16 has severely hampered the ability to respond promptly to equipment failures. Equipment spares are being utilized and the availability of funds for repairing/replacing the spares is uncertain at this time. If the cache of spares is depleted, a critical failed component could mean a site/sites or the System becomes inoperable for an undetermined length of time. The continued failure of future funding could cause the cooperative to fail, resulting in the dissolution of ALMR.

Should this occur, the costs to regain the level of interoperability provided by ALMR and the risks associated with such a collapse remain very relevant.

Areas affected could include:

- State/Local level:
  - Volunteer agencies withdraw rather than pay fees negatively impacting current interoperability between first responders.
  - Cost to implement and maintain separate communications systems
  - Loss of shared spectrum and lack of available spectrum to replace it
  - Loss of security monitoring
  - Inability to meet FCC mandate by some agencies.
  - Possible forfeiture of equipment purchased through federal grant funds
  - Loss of OEM certified system technologists and support for O&M
  - Local communities expected to take the lead in any regionalized, large-scale event
  - Loss of established processes, procedures and protocols

- National level:
  - Lack of available frequencies to support all users

  - Lack of centralized system/incident command structure for out-of-state agencies responding to multi-jurisdictional, multi-agency events
  - Failure to meet NIMS requirements; inability to interoperate
  - Federal agencies responsible for meeting NTIA mandate individually
  - Loss of FirstNet/LTE infrastructure; failure to meet national directives

- Cooperative partners/infrastructure owners:
  - Cost to travel to sites (includes high mountain sites) to remove equipment; technicians from all entities involved plus the contracted removal agency (assumed at the time to be Motorola®)
  - Cost to inventory/store equipment
  - Current equipment compatibility with older conventional systems
  - Loss of funds expended on implementing ALMR
  - Loss of central points of contact (POCs) for first responding agencies
  - System reverts to break/fix status (**NOTE:** This has already occurred)
  - No redundancy
  - Loss of central POC for the public safety community, as a whole

To address their concerns regarding the possibility of continued underfunding of the System, the UC convened a working group. They finalized their discussions by preparing a paper, which addressed the operational impacts to ALMR users from the SOA FY16 reductions and anticipated further reductions to the SOA ALMR/SATS budgets. They also addressed the continuing requirement for funding, beyond the annual operations and maintenance costs, to update the ALMR System ensuring an interoperable, secure and fully functioning communications system for ALMR member agencies.

The UC Chair transmitted the final paper to the Executive Council on September 14, 2015, and encouraged it be widely distributed.

5.0 Conclusions and Recommendation

Creating and maintaining interoperability requires the foresight of leadership at all levels through continuous discussions, planning and the advancement of partnerships at the Federal, State, tribal and local levels. In order to effectively respond to emergencies, both government and industry must plan for, and continually reassess, interoperability requirements,[63] as well as lifecycle funding and maintenance of the systems required to meet those needs.

The annual Business Case update examines the historical ALMR shared system approach both operationally and economically with respect to short- and long-term risks.

In 2012, having gained the majority ownership in the infrastructure, the SOA Legislature requested an audit of the ALMR System to assess the impact of the divesture of the

[63] *See* http://www.ncjrs.gov/pdffiles1/nij/211512.pdf

equipment by USARAK and the State's risks, since the System had not been audited since going fully operational on July 1, 2008. At the conclusion of the over a year-long audit, only one recommendation was made by the auditors. The recommendation was that the Executive Council should ensure all agencies operating on ALMR perform an annual inventory of subscriber units. The council concurred with the recommendation and directed the OMO, as the executive agent for the council, to assume responsibility for ensuring the inventories are completed. This is now completed on an annual basis.

A viable long-term strategy for funding ALMR has failed to evolve. Long-term decisions for cost share and sustainment may change the current rules regarding governance and maintenance standards. How this could affect participation by those agencies currently utilizing the System remains unknown. It is imperative the State address this issue now. If the partnership were to dissolve, the cost of building a comparable system would be far greater than the cost of sustained operations and maintenance funding of the current ALMR System.

The 2015 annual update of the Business Case validates previous decisions that the shared approach still remains the best solution to Alaska's public safety first responder interoperability needs. It also validates the operational and economic benefits for both agencies and stakeholders, and emphasizes the need for funding to fully sustain and maintain the ALMR System.