



# **Alaska Land Mobile Radio Communications System**

## **User Council 2017 Annual Assessment on System Operations and Management Performance**

**January 17, 2018**



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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 2017, there were 125 agencies operating on ALMR. At the end of the year, the total number of agencies was 127 with 21,731 subscriber units in service.

The newest member agencies to join in 2017 were Chickaloon Tribal Village Transportation Department, Lowell Point Volunteer Fire Department, Craig Police Department, Matanuska-Susitna Borough School District and the Kenaitze Indian Tribe Tribal Safety and Corrections.

The decision was made not to renew the Chitina Volunteer Fire Department or the City of Ouzinkie membership agreements, because they have been unable to locate their radios since 2015 and they are currently outside of the ALMR footprint.

The US Attorney's Office – Alaska District elected not to renew their agreement after the State of Alaska proposed to impose a \$1000 per agency/per year access fee.

## **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.

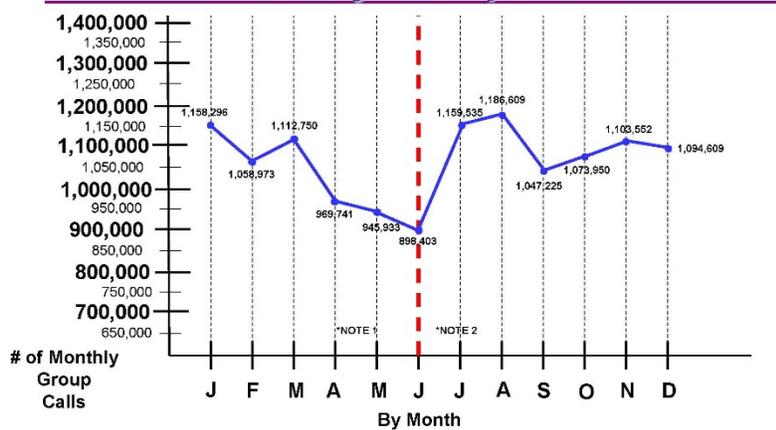
The UC has established a performance baseline standard, with respect to System busies, which identifies day-to-day and emergency operations data for individual sites by both the percentage and duration. When sites exceed established standards, the

Operations Manager reviews the applicable site report 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 shifts, or if there is simply insufficient channel capacity at the site to handle daily operations.

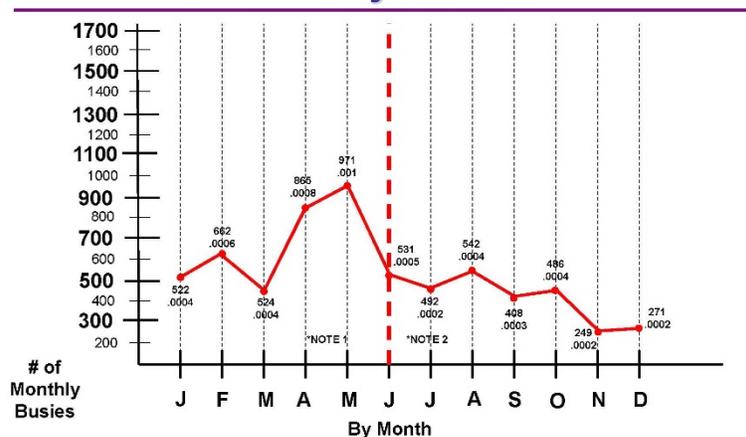
The following charts display the total numbers of System group calls and push to talks per month.

### 2017 System Performance Monthly Group Calls



NOTE 1 : April has five days and May has one day of data collection missing for Zone 2 due to Genesis software update issue.  
NOTE 2: Starting in July, data from Genesis will be utilized as it provides a more accurate calculation of actual group calls, push-to-talks and busies.

### 2017 System Performance Monthly Busies



NOTE 1 : April has five days and May has one day of data collection missing for Zone 2 due to Genesis software update issue.  
NOTE 2: Starting in July, data from Genesis will be utilized as it provides a more accurate calculation of actual group calls, push-to-talks and busies.

In 2017, the ALMR System supported a cumulative total of 12,809,576 group calls and System busies of 6,523 which equaled 5 one-hundredths of one percent of the group calls.

**NOTE:** Starting in July, data from Genesis was utilized as it provided a more accurate calculation of actual group calls, individual push-to-talks and System busies. With the previously used Motorola software, previously listed “voice calls” are the equivalent to the new “group calls.” Push-to-talk figures are not shown for calendar year 2017, as they were started in July and would be misrepresentative of an actual annual total.

#### 4.0 Conflicts/De-conflicts

The New Knik site had a frequency conflict with the Village of Tyonek, Providence Hospital and LifeMed Alaska. A letter of concurrence was received by the State of Alaska Enterprise Technology Services from Providence on April 24, from LifeMed on April 26 and from the Village of Tyonek on June 5.

#### 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 2017, site equipment ownership was as follows (original design number versus current build-out status/ownership):

- US Army Alaska (USARAK) – 45/4<sup>(see note 1)</sup>
- Joint Base Elmendorf-Richardson – 1/1
- Eielson Air Force Base – 3/3
- Clear Air Force Station – 1/1<sup>(see note 3)</sup>
- Municipality of Anchorage (MOA) – 15/12
- SOA – 40/77<sup>(see notes 1, 2, 3 & 4)</sup>

There are currently 98 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 free of charge. 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 86.

**NOTE 3:** The Atwood 800MHz site was removed in May 2013 to utilize as a test bed for the 7.13 System software platform update. The decision was made during the February 5, 2014, User Council meeting not to reinstall the site. The System Change Request was approved by the Executive Council on February 26, 2014.

**NOTE 4:** The State added new sites at Delta Junction and New Knik in May 2017.

## 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 2016, 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.

**Update 2016:** At the August 3 User Council meeting, the decision was made that it was a DOT issue. The consensus was there were higher priorities and it was **TABLED** for the time being.

**Update 2017:** There was no change in the status of this item in 2017.

- **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.

**Update 2011:** The City of Houston deactivated the Police Department in 2011 and is no longer a member of the ALMR System.

**Update 2016:** At the August 3 User Council meeting, it was pointed out that at one time there had been discussion of taking some of the channels from Fire Station 12 to establish a site in the Houston/Knik Goose Bay area because it was growing so rapidly. The consensus of the council was for the potential site to stay on the list.

**Update 2017:** A site was installed at New Knik; however, an additional site is still being considered to resolve remaining communications issues in the area.

- **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:** The System Manager at the time, 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.

**Update 2016:** At the August 3 User Council meeting, it was mentioned that Delta Junction had a long history of the coverage deficiency in the Jack Warren

Road area and this was a major concern. The council voted to leave it on the list.

**Update 2017:** A new site was installed at the previous location in Delta Junction on May 26. The site was declared operational on June 26 after the 30-day burn in period.

This item is considered **CLOSED** and will be removed from future reports.

- **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.

**Update 2016:** ETS put a SATS site up in calendar year 2014, which has conventional radios in it due to power limitations at the site. In order to put ALMR radios at the location, the power challenge would need to be solved.

At the August 3 User Council meeting, the members agreed there was definitely a need to get something out in this area. This item was **TABLED** until more information could be obtained.

**Update 2017:** There was no change in the status of this item in 2017.

- **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 at Rove River, Keystone Canyon, Alpine Woods and Thompson Pass in the Valdez area, which created an officer safety issue.

**Update 2015:** The Department of Transportation and Public Facilities advised they had installed a 120 foot communications tower at the DOT Valdez Weigh

Scales Inspection Station that could provide coverage to the area of concern to Chief Comer which is a housing area behind the airport.

**Update 2016:** This item was briefly discussed at the August 3 User Council meeting, but it was **TABLED** for the time being. A coverage study by Motorola® was reportedly performed, but the results had not been provided to the OMO at the close out of this year's report.

**Update 2017:** There was no change in the status of this item in 2017.

## **7.0 On-going Projects**

7.1 The following equipment upgrades or replacements took place in 2017.

- Channel capacity enhancements – the plan is to add capacity to all existing three-channel sites, as the need is identified and funding becomes available
- Gold Elite consoles were replaced with MCC7500 consoles at the following locations:
  - ❖ Six at Soldotna PSCC (7500); completed April 24 - 28
  - ❖ Two at Ketchikan AST (7500); completed May 22 – 26
  - ❖ One at DMVA EOC (7500); May 30 – June 2
  - ❖ Four at Goose Creek Correctional Center (7500); completed June 26 – 30
  - ❖ One at Tudor Road Master Site; completed March 8

## **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 2017 is:

- 83 total reviewed
- 74 reviewed/approved by the OMO
- 7 reviewed/approved by the UC
- 1 reviewed/approved by the Executive Council/Cooperative Partners
- 1 outstanding approval (2017 Annual Business Case)

## 8.2 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:** March 2  
**Details:** 1638L hours, Juniper Firewall failed. (Motorola Case 25296870, ALMR WO 48094)  
**Findings:** On March 2, 2017 at 1638L hours, the Juniper Firewall that supports the CEN network of the ASTRO 25 system failed. This failure impacted the Over-the-Air-Rekeying (OTAR) system that supports the provision of encryption keys to customer radios in the field and also supports the Genesis data collection system.

This issue began when Mr. Mark Jenks, Northern Zone System Technologist, was working on the firewall to allow new MCC 7500 consoles to be added to Over-the-Ethernet-Keying (OTEK) encryption key system for automatic updates of encryption keys. While Mr. Jenks was making changes, a request to reboot the Juniper Firewall hardware was sent and the hardware rebooted, then failed while powering back up.

Catastrophic event planning began immediately. Initial planning took place as Mr. Jenks and Mr. Travis Conant, System Manager, discussed what actions needed to occur. As agreed upon, Mr. Conant proceeded to the ALMR parts warehouse to check if there were any spares on hand. No spare parts were found in storage. Mr. Jenks contacted Motorola for any assistance they could provide remotely. Motorola Technical Support was unable to provide any assistance to get the firewall to respond, but ordered an advanced replacement part to be expedited via air shipment.

Impact of the loss of OTAR, OTEK and the Genesis system did not impact the majority of the communications processes, just the encrypted portion. However, ALMR lost data for all the radio activity in the Genesis system while the firewall was being replaced.

The hardware failure was not the result of a cyberattack. No data breach occurred. In this event media disposal was not necessary and replaced equipment was sanitized before decommissioning IAW ALMR and DOD policies and procedures.

**Results:** The System Management Office is working on getting a spare for the Juniper firewalls.

**NOTE:** Results of System recovery efforts are also listed in the annual System Recovery Assessment and Backup-Recovery Report, dated December 7.

8.3 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. The distribution of letters and confirmation forms to member agencies began on January 11 and was completed by January 19.

For calendar year 2017, 123 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 July 5, with the receipt of the final agency form.

**NOTE:** Agencies joining in 2017 and those who have valid membership agreements, but who have no subscribers on the System, are not required to complete and return the confirmation form. The applicable agencies in 2017 with no subscribers on the System were the City of Ouzinkie and Chitina Volunteer Fire and Rescue Department.

## **9.0 System Enhancements**

Two new five-channel RF sites were approved and installed in 2017. The first site is co-located in the Municipality of Anchorage shelter in Knik, which will cover gaps in the Knik area, as well as improve coverage in the Eklutna Lake area. The New Knik site was installed on May 26 and declared operational on June 26 after the 30-day burn in period.

The second site is located in the SOA shelter in Delta Junction. It replaced the previous site, which was relocated to Fort Greely in 2005 and is expected to cover the

surrounding Delta Junction area where coverage was previously lost. The Delta site was installed on May 26 and declared operational on June 26 after the 30-day burn in period.

## **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, when funding is available.

During calendar 2017, there were no ALMR agencies who contacted the OMO or the training coordinator and requested training.

## **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 FY19 OMO/SMO Operating Budget was approved by the UC on August 2 for presentation to the EC, which occurred on August 29. The final EC vote of approval for the budget was received on September 22 and the document was finalized and forwarded to Enterprise Technology Services on September 25 by the Operations Manager to provide to the SOA Department of Administration (DOA) for inclusion into the SOA budget.

The SOA Governor's proposed FY19 budget was released on December 15.

## **13.0 Other Focus Areas**

Additional areas currently being tracked:

- **ETS**
  - ❖ Gold Elite consoles were replaced with MCC7500s at Soldotna PSCC (6), Goose Creek Correctional Facility (4), Ketchikan AST (2), the Department of Military and Veteran Affairs EOC (1) and at Enterprise Technology Services (1).

- **Outstanding Maintenance**
  - ❖ Delays in addressing R56 grounding at some SOA sites continues to be a major concern, some now being over 13 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 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). Maintenance will no longer be supported at the depot level and replacement repair parts may become limited. Remaining consoles from 2016 that have been replaced or that have a contract in place to install MCC7100s/MCC7500s include:

Scheduled (tentatively):

- ❖ One at Valdez - Installation in Jan 2018
- ❖ Six at Wasilla (MATCOM) - Installation in March 2018
- ❖ Four at Fairbanks AST - Installation in May 2018

Other areas of concerns that will continue to be monitored by the OMO and SMO are: 1) continue to look for ways to secure permanent long-term funding at the State level for the System, upgrades and equipment end-of-life replacements, as well as sustainment of the day-to-day operations and maintenance of ALMR; and 2) capacity enhancements at remaining three-channel sites and opportunities for improving coverage where communication issues exist within the current ALMR footprint.