Transcript – State of Alaska Telecommunications System

Welcome to this Alaska Land Mobile Radio training presentation on the state of Alaska Telecommunications System, or SATS.

ALMR covers a wide area of the road system and other areas of the state of Alaska. The different ALMR tower sites and other master sites are connected through the SATS system. The SATS infrastructure and ALMR technology are both required to work concurrently to achieve robust and redundant public safety communications for our users. In this overview, we will discuss the SATS system, how it's supported and the importance to all ALMR system users.

The first iteration of what we now call the SATS network started before statehood, where radio communications were required for highway and road crews. By the early 1970s, the Alaska State Troopers' traffic requirements for radios necessitated a handful of sites being constructed and connected together. The network continued to expand, especially aided by several emergencies within the state that required additional infrastructure, including the 1989 Exxon Valdez oil spill and the 1996 Millers Reach Fire.

In the late 90s, when the FCC narrow banding mandate came into existence and the ALMR project was born. The requirements for the ALMR infrastructure required a substantial investment into the SATS system to be able to carry ALMR traffic and be redundant and resilient enough for that network. Most of this was funded through federal funds, and this project allowed for many, many upgrades to technology and physical plant throughout the SATS system.

The network consists of many components, the most visible of which are the various tower and radio sites located throughout the state. SATS consists of primarily microwave connections between these sites. However, there are some commercial telecommunications circuits also in use when geography or terrain do not allow for microwave connections.

SATS also includes all of the various support infrastructure required for radio sites, which includes the physical towers, but also equipment, buildings, power systems, backup power systems, heating, ventilation and air conditioning, monitoring, security and many more components.

The SATS system can be thought of as a private computer network that carries emergency and public safety related traffic. The only traffic or data being carried on the network is for public safety purposes or other official functions, which primarily consists of ALMR radio traffic. There are other radio connections connected to the network as well, which may include areas outside of the ALMR coverage or for other purposes that ALM R is not authorized for.

The SATS network utilizes the highest standards available for redundancy and reliability. Each site in the SAT system has robust power systems, including backups such as batteries and generator power, as well as heating, ventilation, air conditioning and other redundant systems to

ensure that the sites are able to be online and managed remotely as much as possible. Remember that many ALMR and SATS sites may be inaccessible during certain times of the year, or may be off the road system, Or on mountain tops, which requires careful planning and maintenance.

When we talk about the SATS system, it primarily consists of microwave connections, a microwave connection similar to the illustration shown here. It is a connection between one site to another site using microwave radio. Generally, SATS sites have a connection to a neighboring site and they create a chain down the line to ensure that they're able to reach the ALMR system and other infrastructure. Through this network, they are able to reach and communicate with all sites within the system. This illustration does not show any redundancy, but most SATS sites have at least two connections to each tower. That ensures that if there is a break or some error with one site, There is an alternate route to carry that traffic and continue to be reliable. It is important to understand that this microwave connection is highly reliable and public safety grade using state-of-the-art updated equipment. That allows for the uptime and the reliability That is the goal of the system.

We do not use technologies such as Internet connections or cellular connections in SATS. These are typically less reliable than the public safety equipment used and also may expose security risks to the use of the data on the system. Remember, this system is completely isolated from the Internet and cannot be accessed remotely except through the network and the secure areas that they access.

The management and maintenance of the system is through the Department of Public Safety, Division of Alaska Public Safety Communications services. This group has staff based in several locations across the state and consists of radio technicians, electronics specialists, IT staff, electricians and engineers that perform the design, operation and maintenance of the system throughout the year.

A large part of this group's tasks is the maintenance required for every site, at least annually. Preventative maintenance is required for the physical components. This may include items such as lighting, grounds maintenance, heating and cooling systems, and power systems that power each individual site. Each site has a generator which requires annual maintenance and may require refueling periodically.

The IT side of the network also requires maintenance, such as the microwave and radio connections, which may be physical maintenance to items such as antennas or cables or software based maintenance and updates.

SATS and ALMR complement each other by utilizing the SAT system to communicate throughout the system. Without this network, the ALMR network and its broad geographic reach would not be possible. Without that geographic reach, the system would not be able to achieve the interoperability goals of communication through the entire coverage area as needed for emergencies and other incidents. The staff for the ALMR system, as well as the Alaska

Public Safety Communications staff work together daily to ensure connectivity, reliability and uptime for all ALMR users.

If you have questions about the ALMR system or SATS, don't hesitate to reach out to the ALMR help desk or operations management office for assistance.