

**MARIN EMERGENCY RADIO AUTHORITY**

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**DATE:** September 23, 2020  
**TO:** MERA Governing Board  
**FROM:** Betsy Swenerton, Acting Operations Officer  
**SUBJECT:** AGENDA ITEM C-2: Microwave Channel Bank Hardware Failure – Prime Site

Recommended Action: Provide direction on options to replace microwave communication components

Background: During the week of August 3rd, DPW staff noticed that a Channel Bank Wide Area Network (WAN) interface card had failed at the MERA Master Prime site. This specific card was transporting data for the simulcast voice traffic at the San Pedro MERA site. The failure required that technicians temporarily disable the San Pedro MERA site, which resulted in poor or no signal in the China Camp area down to McNears Beach on North San Pedro Road.

The specific equipment involved in this failure includes CPU cards that control the WAN interface cards that transport the voice data between microwave sites. DPW Staff suspects that during a short interruption in power, the CPU card became corrupted because the on-board battery that helps store its configuration failed. DPW communication technicians restored connectivity to San Pedro by rebuilding the configuration for the Channel Bank on the existing CPU card.

The Prime Site CPU/Network card that failed in early August only impacted the San Pedro site. The Prime Site has multiple CPU/Network cards that connect it to all the microwave sites – in some cases, a single card connects multiple sites. In addition to the Prime Site, each microwave site has the same cards – all of which are the same age. The card manufacturer has recommended that they be replaced since they are at the end of their useful life.

Important Considerations and Options:

The existing microwave equipment will be replaced by the NextGen Project. MERA has stated that NextGen is currently scheduled to be up and running by the third quarter of 2023. DPW Staff recommends taking a proactive approach to minimize the impact of potential Channel Bank equipment failures by replacing key components now.

DPW staff is proposing two options for replacing Channel Bank equipment to reduce the risk of communication outages between now and final switchover to NextGen system. Each option includes pricing for the Prime Site, which is the highest priority since any single failure at the Prime Site will result in an outage and has the potential for impacting multiple sites. Pricing is also included for the most critical microwave sites, known as the “Microwave Loop”: Mt. Tam, Big Rock and Mt. Barnabe, because they pass traffic for multiple sites through their channel banks back to the Prime Site. It should be noted that Mt. Tam, Big Rock and Mt. Barnabe have a redundant data path to the Prime Site via the microwave loop, such that it would take two CPU/network card failures to cause an outage, as opposed to one.

The first option involves replacing just the CPU and network cards at the Prime site, Mt. Tam, Big Rock and Mt. Barnabe, as well as a cache of replacement cards that could be installed at the rest of the microwave sites, when needed.

The second option goes a step further by completely replacing the Channel Bank “chassis”, which includes the CPU cards, network cards, and other components within a metal housing. Both options have been vetted with the equipment manufacturer – the added benefit of Option 2 is that all components of the Channel Bank would have the same software, hardware and firmware versions, which would limit potential incompatibilities.

Option 1 – Replace CPU/Network Cards Only

- 1a. Prime Site only: \$34,092 – Price includes replacing CPU and Network Cards within the 4 existing chassis
- 2a. Microwave Loop Sites: \$24,660
- 3a. Various Critical Spare Cards: \$76,152 – this is for cards to be used at microwave sites other than the Loop sites.

Total Cost for Option 1: \$134,904

Option 2 – Replace Complete Chassis, including CPU/Network Cards

- 2a. Prime Site – 4 Chassis at \$25,200/each: \$100,800
- 2a. Microwave Loop Sites – 3 Chassis: \$75,600
- 3a. Various Critical Spare Cards: \$76,152 – same as Option 1, this is for cards to be used at microwave sites other than the Loop sites.

Total Cost for Option 2: \$252,552

MERA may consider either Option 1 or 2 in their entirety, or any of the individually-priced components. A third option would be to wait and replace hardware as needed, acknowledging that there would be increased down time while replacement cards are sourced. This option is not recommended. DPW staff recommends Option 1A (replacing Channel Bank components at the Prime Site) at a minimum.