WASHOE COUNTY

Integrity Communication Service

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STAFF REPORT

MEETING DATE: March 17th, 2022

DATE: Thursday, April 14, 2022

TO: P25 TAC

FROM: Quinn Korbulic, Regional Services IT Manager, Washoe County Technology Services, 775-328-2348, qkorbulic@washoecounty.gov

THROUGH: Behzad Zamanian, Chief Information Officer, Washoe County

SUBJECT: A review, discussion, and possible action to approve expenditures of Purchase of Freedom R8200 all-in-one test systems in support for testing the new P25 System.

SUMMARY

Recommendation to approve and recommend to the Joint Operating Committee approve the expenditures of a new Test Equipment for a cost of [$220,000].

Washoe County Strategic Objective supported by this item: Strengthen our culture of service, and leverage technology to streamline and automate, while providing efficient regional services.

PREVIOUS ACTION

N/A

BACKGROUND

Test equipment is necessary to conduct radio alignments to keep equipment functioning at peak performance. It will be necessary to get equipment that supports the new P25 protocol, before we cut over to the new system, in order to validate and test the new network being installed.

RF testing is a way to check the frequency of your radio broadcasts to ensure that they are using their space on the spectrum efficiently. In this sense, efficiency means that the radio waves are not interfering with each other in the air space. RF testing will look at several different aspects of your device. Testing includes, but is not limited to, things like output power, receiver and transmitter tests, sensitivity, and blocking. A radio frequency test is performed by taking the device and placing it in an isolated area. The area is controlled to minimize electromagnetic interference with the device. From there, the device is monitored closely for any emissions that would interfere with the operation of other devices in the area. If two signals are occupying the same wavelength and frequency, they can cause problems on the receiving end. A good example of interference causing signal loss is when you try to pick up a radio station and hear it cut back and forth between two different broadcasts.

AGENDA ITEM # _____

There are two types of interference: Narrow Band and Broadband. Narrow Band refers to broadcasts with short, narrow wavelengths. Examples of this kind of frequency include things like co-channel and adjacent-channel transmissions. Broadband, which is the more commonly known of the two, refers to larger wavelengths. This would be things like digital television broadcasts, as well as common wireless systems like Wi-Fi, cellular devices, and Bluetooth connections. By testing on both frequencies, you can identify the exact source and nature of any potential interference. For example, narrow band can result in Adjacent-Channel Interference, which is where two channels on similar frequencies bleed into each other.

Proper testing can identify these kinds of issues before they create problems in the system. It is important to remember that Section 303(n) of the Communications Act of 1934, as amended, (Act) gives the Federal Communications Commission the "authority to inspect all radio installations associated with stations required to be licensed by any Act, or which the Commission by rule has authorized to operate without a license under section 307(e)(1), or which are subject to the provisions of any Act, treaty, or convention binding on the United States . . ." 47 U.S.C. 303(n) Both Section 303(n) of the Act, and the Rules which implement the Act, grant the right to inspect most radio operations to the Commission, and by delegated authority to the Commission's Bureaus and agents. The Enforcement Bureau conducts inspections of radio installations as part of the Bureau's function to "[e]nforce the Commission's Rules and Regulations." 47 CFR 0.111(a).

Both licensees and non-licensees must allow an FCC Agent to inspect their radio equipment. Along with the privilege of possessing a license come responsibilities such as knowing the applicable rules, including allowing the station to be inspected. Licensees should be aware of the Commission's right to inspect.
Failures to maintain and keep your equipment in the manufacturer’s specified parameters can mean the FCC can force you to terminate or suspend your license privileges.
The P25 Standard consists of over 80 individual documents, it is more accurately referred to as the P25 Suite of Standards. To date, all documents included in the P25 Suite of Standards have been created by and are maintained by the Telecommunication Industry Association’s TR-8 Mobile and Personal Private Radio Engineering Committee. These documents comprise the TIA-102 series of standard documents.
The Project 25 Standard highly recommends the use of the FREEDOM R8000, R8100 and R8200 Test equipment. FREEDOM, an Astronics Company is the world’s only firm dedicated exclusively to the Land Mobile Radio test equipment market.
FREEDOM R8100, R8000 and R8200 Communications System Analyzers perform comprehensive signal quality analysis for both P25 Phase 1 and Phase 2 radios. Among the P25 specific measurements are Symbol Deviation, Symbol Rate Error and Bit Error Rate. The P25 option also performs real-time decoding of voice frames and in P25 Trunking mode, displays Network Identifiers, Header Words and Link Control information.
FREEDOM analyzers generate and receive every test pattern and modulation type called out in the P25 standard. Multiple graphical displays are available including Eye Diagram, Distribution
Plot, Constellation and Power Profile. Recovered audio can be heard with our vocoder option. FREEDOM has the vocoder specific to Harris P25 and was a recommended

testing device at the Harris User Group conference. FREEDOM R8000 series devices are Class 3 Mil-Spec shock and vibration rating at test to its suitability for nearly any

LMR test environment.

FISCAL IMPACT

This purchase will take place over the course of two Fiscal Years 2022-2023 Budgets. These budgets have sufficient budget authority in Washoe County Regional communication System (210) in RCS Infrastructure (210300), Equipment Capital (781004) in an amount of [$220,000]

RECOMMENDATION

Approve and recommend to the Joint Operating Committee approve the expenditure for Washoe County Regional Communication System team to purchase new P25 testing equipment for a cost not to exceed [$220,000].