CO-OPS Engineering Bulletin 20-003

Engineering Change: Upgrade IP Modem Antennas to Wide Band Digital Antenna Model 1273-PW at all Stations with Sierra Wireless RV50 / RV50X 4G IP Modems

Systems Affected: All CO-OPS owned systems using Sierra Wireless RV50 4G IP Modems

Originating Team: Chesapeake and Seattle Instrument Labs

Approval Date: 07 February 2020

Background: CO-OPS uses both phone lines and IP modems to provide two way communications into our operational stations. Older 2G and 3G IP modems operated at a single fixed frequency, so they were paired with antennas that were matched to their specific frequency. With the advent of 4G, and soon 5G, technology the frequency at which the modems operate can vary from one tower to the next and can change over time as towers are upgraded. As such, it is necessary to use a wide band antenna on newer IP modems to ensure that they have connectivity going forward. While an older antenna may work today it could stop working if the local tower is upgraded. The newer wide band antennas provide connectivity over a broad range of frequencies rather than at a single fixed frequency. While alternatives may be used on a site by site basis the Digital Antenna model 1273-PW has been identified as the standard IP antenna for use at CO-OPS owned and maintained stations. The antenna provides a 7dB gain at frequencies from 695MHz – 3GHz making it compatible with all towers currently operated by cellular providers in the United States.

Action Required: During the next regularly scheduled site visit, replace all older style IP modem antennas at stations where 4G RV50 / RV50X IP modems are installed with a wide band Digital Antenna 1273-PW cellular antenna. This includes whip antennas, mushroom antennas, and small finger whip antennas. The IP modem antenna cable should be evaluated at the time of antenna replacement and should also be replaced if it shows significant signs of aging. If an alternative antenna needs to be used (e.g., a directional antenna or small finger whip) please consult CIL or SIL for a compatible unit. Where feasible, the new antenna should be installed inside the enclosure. When a good signal can be obtained inside the enclosure a Polyphaser lightning arrestor is not required. If the signal strength is degraded following the antenna upgrade, please contact your local instrument lab for guidance on techniques for improving the signal strength. It is recommended that field crews keep a few spare antennas and cables on hand to enable antenna upgrades at stations where older antennas are discovered while onsite.

Estimated Time To Complete: 15 minutes to 1 hour to depending on complexity of install.