

Oklahoma Gas and Electric

Project Background

Oklahoma Gas and Electric (OG&E) has been deploying intelligent devices in significant quantities since 2010 as part of grid modernization efforts. The telecom network that has been deployed allows for communication with the following devices: digital meters, substations, distribution and transmission devices. This allows OG&E to control and monitor substation, distribution, and transmission equipment. In addition, the communication network is used by OG&E to communicate between office locations, for example, between the control centers and backup control centers. Today OG&E's telecom network (also known as Field Area Network) consists of microwave, freewave, and mesh networks. There are several challenges with the current Communications Systems:

1. The radio frequency that the microwave network operates on is at risk of being opened to unlicensed public use. This will cause interference from less sophisticated communication systems, resulting in poor telecommunication connection.
2. The devices on the microwave network are also nearing the end of life and are becoming obsolete.
3. The freewave wireless network is no longer a supported product and parts are not available to repair failing components of the network.

The communications program looks at the different levels of the telecom network for bandwidth and latency requirements. For example, the highest layer is called the backbone or Wide Area Network. This network aggregates all the traffic from the lower levels; thus, it requires high bandwidth and low latency. Bandwidth is the amount of data that can be sent over a specific communication channel (size of the pipe). Latency is how fast data moves across the communication channel. SCADA and distribution automation require low latency while meter interval data and firmware updates require high bandwidth. The current communication system has multiple layers to support various needs. Other layers are still effective in meeting current and future needs. The program looks at the current challenges and future requirements and designs a system that will alleviate the obsolescence issues and provide for the future needs of the company.

Private LTE Project

OG&E analysis has led to a decision to evaluate Private LTE to address the needs of the organization. The theoretical work has been completed to lead to the decision to test the solution in the field.

OG&E has developed a program to test Private LTE operating on various spectrums. Specifically, the project will look at band 48 and band 8. The key items that will be investigated are:

1. Coverage and propagation – The theory suggests that band 48 and band 8 have different propagation capabilities with band 8 being a potentially preferable choice to provide broad coverage.
2. Latency and bandwidth – The devices that will be on the OG&E telecom network have significantly different latency and bandwidth requirements. The spectrum will be evaluated to determine how each can support the various latency and bandwidth requirements.
3. Spectrum Access System (SAS) impact – The project will evaluate the issues with complying with the Spectrum Access System.