

## About San Diego Gas & Electric

SDG&E is a regulated public utility that provides power to a population of 1.4 million business and residential accounts throughout a 4,100 square-mile service area.



Figure 1 - SDG&E's Service Territory

SDG&E employs more than 4,000 people who work every day to deliver the energy our customers depend on.

## Background

SDG&E has a long-standing commitment to safety and reliability. Safety and risk reduction for our employees, contractors, and the public are core values. In addition to achieving excellent performance in safety in recent years, the reliability of SDG&E's electric service has also been an area of consistent superior performance. SDG&E's best-in-class reliability performance has resulted in recognition and awards from third parties, including being ranked "Best in the West" in reliability by the PA Consulting Group, earning their regional ReliabilityOne award for twelve consecutive years.

Key to providing safe, reliable energy is the comprehensive communications infrastructure that SDG&E has implemented. SDG&E is in the process of upgrading all of its wireline network infrastructure to implement Multi-Protocol Label Switching (MPLS) which enables the network to support multiple traffic types and provide quality of service to critical and non-critical applications over a single network infrastructure. The MPLS infrastructure is also a solid base for the introduction of Software Defined Networking (SDN) which has enabled SDG&E to more rapidly and efficiently deploy mission critical services.

SDG&E currently operates multiple, disparate wireless networks to provide connectivity for applications such as Distribution SCADA, Advanced Metering, Faulted Circuit Indication, and Mobile Workforce communications, including mission critical Push-to-Talk services. Many of the new and upcoming applications require a larger volume of data, and additional bandwidth is required.

SDG&E believes that recent advances in wireless technology could allow the company to consolidate many of these networks, just as has been done on the wired network. This consolidation will provide not only more reliable and cost-effective communications for energy delivery, but also enable new, innovative applications.

However, as the focus of current LTE equipment vendors and network operators has been on public communications services, SDG&E must assess the suitability of the technology for the utility-specific use cases, which are quite different in nature.

Unlike public cellular communications use cases (digital voice, Internet access, navigation, text and multimedia messaging, etc.), which are typically downlink centric and delay tolerant, the utilities use cases (SCADA, Metering, Faulted Circuit indication, and Mission Critical Push-to-Talk) are uplink bandwidth intensive and extremely delay and reliability sensitive. In many cases the endpoints are at fixed locations, and therefore cannot re-locate to find “better signal” as a consumer might be able to do.

SDG&E intends to deploy private LTE network infrastructure to evaluate the technology’s ability to support these applications. A key component of a private LTE network is the frequency of operation and while there is not currently an allocation dedicated to the critical infrastructure industry<sup>1</sup>, SDG&E believes that the Citizen’s Broadband Radio Service (CBRS) as described in the CFR, Title 47, Part 96 could meet these needs.

Evaluating the performance of LTE systems and the potential for interference is critical to understanding the suitability for these systems to meet the current and future needs of both SDG&E and those of our customers. In response to the recent deadly wildfires in California, the Public Utilities Commission required that SDG&E develop and implement a Wildfire Mitigation Plan. While the plan that SDG&E developed is many faceted, a key component of it is to provide advanced wireless communications to support our innovative Falling Conductor Protection (FCP) system, which when implemented on an overhead distribution circuit, is able to detect a powerline that has failed and de-energize it before it comes in contact with the ground, protecting life and property. The FCP system was initially developed using proprietary communications infrastructure, however in order for the company to deploy it throughout the territory, an industry standard approach would be beneficial. To that end, SDG&E must evaluate both the LTE infrastructure and the RF frequency to ensure that it meets the stringent technical and operational requirements.

## Special Temporary Authority Request

SDG&E requests Special Temporary Authority to test the suitability of LTE-Advanced equipment operating in the CBRS spectrum for providing communications for the applications described above. In particular the tests will determine if the 10 MHz or 20 MHz TDD channels will provide the coverage, capacity, and latency required to support SDG&E mission critical utility applications all the while not causing any co-channel or adjacent channel interference to existing licenses.

SDG&E will install LTE-Advanced eNodeBs (base stations) at five fixed locations, each location will have three “sectors” and provide overlapping coverage to assess performance of handover to support the high-availability requirements of our mission critical communications.

The testing will involve wireless connectivity to both fixed and mobile locations within a specific radius of each transceiver (base station) site.

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<sup>1</sup> <https://utc.org/utc-report-on-spectrum-for-utilities-mission-critical-applications/>

SDG&E will evaluate LTE-Advanced using 10 and 20 MHz channels as NB-IoT using 200 kHz channels. All testing will comply with CFR 47 Section 5.84 and not cause harmful interference to any station, either co-channel or adjacent channel, operating in accordance of the current NN and/or CBRS band plans.

SDG&E specifically requests that due to the topography in the Borrego Springs Valley, notification to incumbent licensees of the testing should be limited to those having sites within 40 kilometers of the station locations. Notification only of testing is appropriate, as no licensee operates in the test area on the channels to be tested. Consent should not be required of any licensee.

Technical details of the equipment are documented in the Manufacturer and Station Location sections of this application.

Per the requirements set forth in CFR Part 47, Section 5.107, SDG&E will manage and monitor the equipment and testing from 8680 Balboa Avenue, San Diego, CA, 92123 which is manned by qualified staff. Additionally, SDG&E will from time-to-time have qualified, personnel on-site to perform set-up and adjustments as the testing plan and activities dictate.

At the conclusion of the experiment, SDG&E expects to be able to confidently state whether a network built using LTE-Advanced equipment in CBRS allocation can support SDG&E's unique, mission critical communications needs and whether such a network will be able to operate side-by-side with other networks with no harmful interference to either system.