Xcel Energy Services Inc.
Statement in Support of Experimental License Application

Pursuant to Section 5.63(c)(1) of the Rules of the Federal Communications Commission ("FCC" or "Commission"), Xcel Energy Services, Inc. ("Xcel Energy") hereby provides this narrative statement in support of its application for an experimental special temporary authority ("STA") to conduct technical trials using spectrum in the 5.85-6.4 GHz range from specified locations in Eau Claire, Wisconsin in accordance with the technical and operating parameters described in the accompanying application.

Xcel Energy requests the grant of an experimental STA for a term of thirty (30) days from the grant of this application, to operate equipment listed in the STA application per the terms specified in the same STA application.

I. Background

Xcel Energy, Inc., an electric and natural gas utility holding company based in Minneapolis, Minnesota, provides a comprehensive portfolio of energy-related products and services through its public utility operating company subsidiaries to approximately 3.6 million electricity customers and approximately 2 million natural gas customers in eight states – Colorado, Michigan, Minnesota, New Mexico, North Dakota, South Dakota, Texas and Wisconsin. Xcel Energy leads the nation as a premier renewable energy provider, supplying approximately 6,700 MW of wind and 1000 MW of solar energy through its operating companies Northern States Power Company – Minnesota, Northern States Power Company – Wisconsin, Public Service Company of Colorado, and Southwestern Public Service Company.

Xcel Energy operates many licensed microwave radio paths in the 6 GHz band. These microwave facilities provide critical communications in support of its affiliated operating companies, which include fixed point-to-point services as well as fixed-to-multipoint services that support safe, reliable, and efficient delivery of essential electric utility services such as load management, telemetry for protective relays, and supervisory control and data acquisition ("SCADA") systems. Reliable, uninterrupted operation of these microwave facilities are crucial to maintaining efficient, safe operations.

II. Overview

Xcel Energy is currently using its 6 GHz microwave network as a telecommunications transport backbone in support of its affiliates' electric and gas utility operations. These applications include Advanced Meter Infrastructure ("AMI") backhaul, SCADA, remote engineering access, telephony, fault monitoring, land mobile radio ("LMR"), and general workforce mobility applications.

On April 23, 2020, the FCC released a Report and Order opening the 6 GHz band to WiFi and other unlicensed uses.[1] After reviewing the Report and Order, it was clear that some of the incumbent 6 GHz band microwave operators were concerned that there existed a potential for interference with existing 6 GHz microwave infrastructure by unlicensed WiFi operations in the same band. While proponents of the expansion of unlicensed WiFi into the 6 GHz band argue that there is little chance of interference due to the constraints levied by the FCC, organizations experienced in 6 GHz microwave engineering have provided mathematical and theoretical arguments that present valid concerns regarding the potential for interference. No real-world test results were presented by either the WiFi advocates or the Fixed Service incumbents, thus leading to uncertainty regarding the true impact of unlicensed WiFi operations in the 6GHz band.

As described herein, Xcel Energy would like to perform an interference test using commercially available 6 GHz WiFi hardware utilizing the power constraints specified in the FCC's Report and Order. The plan is to locate a WiFi device inside of the 3db Fixed Service antenna beam width of one of Xcel Energy's 6 GHz microwave hops. The chosen location is a location where 6GHz WiFi is likely to be used (a hotel room) once 6 GHz WiFi becomes commercially available. The purpose of the test is to observe any impact to the Fixed Service link when a 6 GHz WiFi device is operated according to the power levels specified in the Report and Order as well as contemplated in the related FNPRM, for low power indoor operations.[2]

Accordingly, Xcel Energy requests the grant of an experimental STA for a term of thirty (30) days from grant of this application to perform field testing as specified in this request for STA.

III. REQUEST FOR CONVENTIONAL EXPERIMENTAL RADIO STA

A. Purpose of Test

Xcel Energy requests a conventional radio experimental STA to test for interference to Xcel Energy's existing licensed microwave operation by WiFi transmitters in the 6 GHz band for the purpose of conducting technical radio research. This testing is meant to allow Xcel Energy to develop an understanding of the potential for interference to existing 6 GHz microwave radio operations by unlicensed 6 GHz WiFi radio devices. During the testing period, Xcel Energy technical staff will examine the microwave path for a reduction in receive signal quality, increased bit error rate and other deviations from baselined performance when the 6 GHz WiFi device is powered on. Degradation of microwave services will have a negative impact on the

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[1] / *Unlicensed Use of the 6 GHz Band, Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, ET Docket No. 18-295, GN Docket No. 17-183, Report and Order and Further Notice of Proposed Rulemaking, FCC 20-51 (rel. April 24, 2020) ("Report and Order").

[2] / *See Id.*, ¶¶ 96 – 173.

various services using that microwave transport: AMI backhaul, SCADA, remote engineering access, telephony, LMR, fault monitoring, and general workforce mobility applications.

B. Technical Parameters of Test

The testing will involve establishing 6 GHz WiFi connectivity within likely interference zones on one of Xcel Energy's 6 GHz microwave links. Details on the Mimosa transmitting equipment to be used in this testing are provided in the technical sections of this application. The WiFi device that Xcel Energy plans to test is WiFi certified and operates in the 4.9 – 6 GHz band. The WiFi device has a station class of FX and will be operated at the maximum Power Spectral Density specified in the 6 GHz Report and Order (5 dBm / MHz going on to test 8dBm/MHz as referenced in the related FNPRM) for a low power indoor AP. Since the WiFi device can operate in a maximum channel bandwidth of 20MHz, the WiFi device power maximum will be set to +18dBm up to +21dBm, with an antenna gain starting at 8dbi testing up to 25dbi. Xcel Energy plans to deploy one WiFi device (with integrated 8dBi antenna) mounted on a tripod indoors in the hotel room; a second identical device will be aimed at the first while simultaneously being aimed at the Xcel Energy microwave dish antenna. It is this second device that will have it transmit power and antenna gain vary per the above described levels. No modifications will be made to the existing Xcel Energy microwave path that is being subjected to testing, other than the use of alternate routing of critical traffic that may be impacted by the testing.

The testing will likely be carried out over a single weekday between the hours of 9:00am and 5:00pm local time. This testing will be performed in a manner consistent with daytime operations and will remain congruent with the requirements of Section 5.107 of the Commission's rules. WiFi system management and monitoring will be handled locally at the interference test site (hotel). Xcel Energy will monitor the set-up and operation of the WiFi test radios to make reasonably certain that there will be no harmful interference to incumbent users and to remedy harmful interference in the unlikely event it occurs.

Xcel Energy will comply with the power levels in FCC ET Docket No, 18-295 Section III B. (2) paragraph 110 specifying a maximum 5dBm/MHz PSD for low power indoor Access Point operation; we will then deviate from the 5dBm/MHz level and test with an 8dBm/MHz level to understand the impact to Xcel's existing 6 GHz microwave link in this area.

Accordingly, Xcel Energy requests the grant of an experimental STA for a term of thirty (30) days. It is the intent of Xcel Energy to report any witnessed impacts to Xcel Energy's licensed 6GHz microwave link to the Commission once the testing period has ended.