Related to the Nokia application for an Experimental License for Nokia Coppell Texas Facility

Planned accomplishments of the pilot/testing

Program of research and experimentation proposed including description of equipment and theory of operation:

Nokia is a leading manufacturer of Wireless Communications equipment, and will use the requested frequency band to conduct testing of equipment in 5G technology at the Coppell Texas facility . Utilizing this frequency for testing and experimentation, Nokia expects it would provide the expected customer operations savings, quality enhancements and better safety, and therefore it will contribute to the general acceptance and broader usage of this 5G technology.

The grant of the requested experimental license will allow Nokia to

- Demonstrate its Wireless concepts and products to its potential customers
- Enhance its efforts to design and develop equipment to meet the communications needs of its customers
- Verify that the frequency band can be used for the superior 5G technology use cases for operational efficiency

Specific objectives thought to be accomplished:

Prove that 24Ghz can be used as superior mobile connectivity technology for use cases mentioned above to increase enterprise operations efficiency. Testing will be done at the Nokia Facility in Coppell using Milimeter Wave Antennas beamwidth below as

Antenna configuration	Integrated 2T2R
Typical antenna gain*	26 dBi
Minimum azimuth beamwidth (°), HPBW	8.7°
Azimuth scanning range	±45° (3dB), ±60° (8dB)
Envelope azimuthal beamwidth (°)	±60° (8dB)
Minimum elevation beamwidth (°), HPBW	6.4°
Envelope elevation beamwidth (°), HPBW	±15° (3dB)
Dynamic elevation scanning range	Beam set dependent
Vertical electrical boresight angle	0°
Front to back ratio	> 40dB
Cross-Polar discrimination (boresight)	> 20 dB