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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

VIA HAND DELIVERY

Ms. Magalie Roman Salas, Secretary
Federal Communications Commission
Experimental Licensing Branch
445 12th Street, S.W.
Washington, DC 20554

Re: Spike Technologies, Inc.
Experimental Station WA2XCV
Nashua, New Hampshire
Progress Report

Dear Ms. Salas:

Submitted herewith on behalf of Spike Technologies, Inc. ("Spike"), licensee of the above-captioned experimental facility, is an original and one copy the station's annual progress report as required by the terms of its authorization. This is Spike's sixth progress report filing.

Please contact the undersigned if there are any questions.

Respectfully submitted,

E. Lawrence Zoll

cc (w/enclosure): Carl Huie

Enclosure

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Spike Technologies, Inc.

Experimental License

Station WA2XCV

Progress Report No. 6

INTRODUCTION

Spike Technologies, Inc. is a producer of broadband wireless access equipment with engineering and manufacturing facilities in Nashua, New Hampshire. Spike's technical strengths include a patented sectored antenna system that creates a group of narrow, individually focused beams, resulting in greatly increased capacity through frequency reuse, two-way capabilities, and the ability to reduce interference to and from the system by positioning the beams accordingly.

In late 1995, Spike began developing equipment for bi-directional delivery of digital services such as Internet, data connectivity, videoconferencing and telephony over MMDS channels. These services will enable the wireless operator to more effectively compete in a highly competitive marketplace for delivery of advanced communications services.

In July 1996 Spike was granted an experimental license to test its systems using MMDS and ITFS spectrum in the vicinity of the Company's Nashua, New Hampshire technical facility. The license specified that Spike be required to submit semi-annual reports of its progress to the Commission. The first of such reports was filed in January 1997 ("the January 1997 Report"), and contains details of Spike's accomplishments in both technical and market development issues. The second of such reports was filed in July 1997 ("the July 1997 Report"), and focuses on equipment integration issues, macro cell size, the pending two-way ruling and future development plans. The third report was filed in January 1998 (" the January 1998 Report"), and provides information on equipment design and test improvements, type acceptance, the current two-way rulemaking proceeding, CLEC certification activity and international efforts. The fourth report was filed in July, 1998 ("the July 1998 Report"), and discussed developments in the areas of equipment design and testing, expansion of system operations, CLEC certification, international efforts, type acceptance and the two-way rulemaking proceeding. The experimental license was renewed for a second two-year term effective August 1998, and called for annual reporting. The fifth progress report, filed in August of 1999, focused on various equipment design enhancements, regulatory activities, and international developments.

Summary of Items from the Prior Reports

Throughout the January 1997 Report, we touched on various technical issues, and discussed our approaches going forward in these respective areas. By this time, we had made significant progress in our component-level designs, and our planned enhancements for our components were fairly clear. We needed to add diagnostic capabilities to our transceivers, so they could be monitored remotely. Also, we needed to examine additional modem designs and explore different modulation techniques. We were less clear on what system-level issues might arise, although we knew such issues were certain to surface.

By July 1997, we were well focused on system level issues including the integration of computer networking equipment with the broadband RF equipment. Additional modem

prototypes suitable for bi-directional broadband data transmission had still not yet become available.

By January 1998, we had improved our transceiver design and the equipment type acceptance process was underway. Necessary system performance parameters, to ensure robust operation, were becoming clear and our first international system was installed in South America. We also began the process for certification as a Competitive Local Exchange Carrier (CLEC).

By July 1998, we had obtained CLEC certification and expanded our South American installation to service a larger subscriber base. We continued our involvement in regulatory issues and submitted additional comments for the 2-way rulemaking. We also received a grant of equipment authorization for our initial transceiver design.

By August 1999, we continued to make significant progress in the areas of transceiver design, modem performance, system design, international deployments and regulatory issues. These efforts have continued to the present time, all as a direct result of our experimental license activities.

HARDWARE DESIGN AND TEST

Transceiver Design

Spike's second-generation transceiver design described in the July 1999 report was granted equipment authorization for use in the MDS/ITFS services on May 5, 2000 (FCC ID MXM-HIGHPOINT200). This design features an environmentally sealed metallic housing with integral fins, and mature software allowing field programming and diagnostics.

We implemented several additional improvements into the transceivers to enhance reliability and functionality. The most significant of these was an increase in radio third order intercept point, resulting in lower spectral regrowth and more linear operation, ultimately increasing link performance and range.

Modem Equipment

Spike has deployed modems manufactured by LanCity for some time. These units utilize QPSK modulation in both directions. Performance and reliability are good, however, more sophisticated capabilities are desired.

We performed thorough evaluation of an alternate source of modems manufactured by Integrity Broadband Networks. Results have been very favorable, and we have integrated them into our experimental system as well as an already deployed system.

The Integrity modems incorporate an innovative AIRDocsis™ extension of the DOCSIS™, MAC Protocol for application in a wireless environment. They feature:

- TDMA/FDMA shared access
- Capability to operate using multiple upstream subchannels
- Operation using higher order modulation schemes (QAM16, QAM64)
- Configurable data rate and modulation type

- Capability for asymmetrical operation
- Higher throughput (up to 20 Mbps)

These features result in greater capacity, improved operational flexibility, and more efficient use of valuable spectrum.

Antenna Development

Spike has enhanced our standard 22-sector antenna by developing a 24-sector version utilizing its patented S^2R™ (Simultaneous Spectral Reuse) technology. This 24-sector antenna continues to allow frequency re-use while permitting an even higher degree of sectorization, thus achieving maximum efficiency, throughput and capacity within a given amount of spectrum.

Currently under development is an "adjustable tilt" antenna, which allows each individual sector to be independently adjusted in elevation. This will provide even more coverage flexibility and has the added benefit of reducing potential interference between cells.

SYSTEM DESIGN AND TEST

In November of 1999, the Nashua 2.5 GHz experimental system was upgraded to incorporate the recently FCC-certificated Spike transceivers. In addition, the Integrity modems have been successfully integrated into two sectors of the Nashua system allowing for verification of the higher order modulation schemes. The Nashua 2.5 GHz experimental system currently features both the LanCity and Integrity modems operating in adjacent sectors. The long-term performance of these modems will continue to be evaluated.

International

Over the past year, Spike has deployed many new systems and has upgraded several others, including sites in Poland, Trinidad, Ghana, Mexico and Argentina. The Poland sites were upgraded to include the Integrity modems – a direct result of our very successful modem development effort here in Nashua, under our experimental license. These overseas system deployments drive our overall hardware and system development forward, thereby helping us enhance our position in the US market.

FCC Regulatory Matters

Over the past year, Spike acquired MDS BTA 357 located in the Portland-Brunswick, Maine area. On May 25 2000, Spike was granted authority to operate a developmental MMDS station located in this BTA. As both a spectrum holder and equipment manufacturer, Spike is in a unique position to further contribute to the development of advanced two-way services through real world testing of its technologies. The use of the Nashua experimental license and the Portland developmental license allows for comparative analysis of Spike's system as development continues.

We have continued our active participation in rulemaking issues, with particular focus on the two-way communication enhancement of the MDS and ITFS services. Spike plans to file for a permanent two-way MDS license in the upcoming filing window. We are working to finalize our interference analysis and consent activities, as mandated by the latest rules. We plan to vigorously continue our participation and involvement in pertinent regulatory matters.

Future Activity

Utilizing its experimental license, Spike plans to:

- Incorporate and evaluate the new 24-sector antenna;
- Incorporate and evaluate the adjustable sector elevation feature;
- Evaluate the impact of higher order modulation schemes with Integrity modems (i.e. QAM64 downstream, QAM16 upstream);
- Integrate and evaluate other modem sources; and
- Evaluate potential transceiver design features such as subscriber transmit output squelching.

Spike has recently applied for renewal of its 2.5 GHz experimental license.

Please contact the undersigned if there are any questions or if further information is desired.

Sincerely,

David Clark
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