

Item 7: Narrative Statement

Background:

Science Applications International Corporation (“SAIC”) is the largest employee-owned research and engineering company in the United States, with revenues approaching \$7Billion and more than 40,000 employees. SAIC is internationally recognized as a leader in providing information technology services, system integration, and e-solutions to commercial and governmental customers. In the wireless area, SAIC has on-going programs to promote public safety interoperability, location monitoring and reporting, secure wireless LANs and WANs, and first-responder support systems. SAIC is working on contracts with the Office of Domestic Preparedness (ODP), state and local first responders, and the Department of Defense. SAIC’s goal is, “linking people and data anytime, anywhere.”

Part of SAIC’s wireless program development for the public safety community is to develop new equipment and systems for the newly-allocated 4.94 - 4.99 GHz band.¹ This band has the potential to provide high-speed data and possibly voice to emergency vehicles over wide areas through the deployment of numerous wireless access points to provide contiguous coverage. Development of these wide-area systems is just beginning and SAIC is leading the way in that effort. SAIC envisions development of secure, robust networks that will provide first responders with vital information, in real time, delivered to vehicles, personal data assistants (PDAs), or other portable wireless terminals. This is critical for responding to new and evolving threats and scenarios.

The purpose of the Experimental License being requested is to allow SAIC to 1) demonstrate the viability of 802.11(g) and similar technology in the newly authorized public safety band from 4.94 - 4.99 GHz at various locations within the United States, and 2) conduct an experimental program to develop equipment with various modulation techniques that fit within the basic 802.11(g) mask, primarily in three “test bed” areas.

Research Program:

Although there are various wide-area solutions in place in other bands, the 4.9 GHz public safety band provides new and unique challenges. This band provides opportunities to deploy wideband data equipment over large geographic areas to provide essentially seamless high-speed data to emergency responders. Design of systems with sufficient infrastructure to provide RF coverage to the area to be served is just the beginning of the design issues. Each access point must be interconnected to sufficient fixed infrastructure to provide hand-off from site-to-site while minimizing the number of hops, as well as the ability to maintain the location of each mobile unit to allow immediate peer-to-peer communications. The system must be able to provide

¹ The proposed program would be in support of equipment and infrastructure that would operate under the provisions of the FCC Rules and Regulations, Part 90, Subpart Y. Portions of these rules are currently under reconsideration by the FCC, including the permissible emission mask.

information from hundreds of data bases, including building blue prints, maps, meteorological data, and law enforcement information (eg NCIC crime database connectivity). Additionally, the system must be capable of relaying real-time video from emergency response scenes, or high quality pictures for diagnostics and triage.

The scope of the research program involving RF characteristics consists of propagation studies, development of frequency reuse patterns, and techniques to minimize interference between sites that are part of the same system and sites belonging to other networks, hence optimizing spectrum usage. On the data side, the program will look at data error rates in a mobile environment, data throughput limits, error correction techniques, and maximum site loading. To conduct such a research program, SAIC may deploy up to 150 fixed stations over each test area and operate a sufficient number of mobile units to tax the limits of the system. Fixed stations will be installed in key locations within each test area, including, on poles, on rooftops, or other fixed facilities, such as, traffic lights and lamp posts. In these areas, SAIC also plans to experiment with point-to-point and point-to-multipoint uses of the band using up to 26 dBi antennas, as contemplated in Section 90.1215 of the rules. Research will be conducted primarily in three locations: San Diego, California; San Jose, California; and New York City, New York.

In addition to the specific research program, SAIC needs the ability to demonstrate its equipment at trade shows, at public safety facilities (working with the public safety entities in the area to assure that no interference will be caused), and at other locations as may be needed to prove the viability of the design to the public safety community. Locations may include industrial, residential, and rural settings. Such demonstrations may occur anywhere within the United States. SAIC plans not to operate more than ten sites in any one demonstration area outside its licensed test bed regions.

SAIC stands ready to provide the FCC with any and all details of its research and demonstration operations that may be conducted under the Experimental License in accordance with Section 5.73 of the FCC rules. Further, SAIC believes that the research program fits squarely under one of more of the qualifications listed in Section 5.3 of the FCC rules, thus qualifying for an Experimental License.

Equipment:

At the present time, there is no commercially available equipment for the 4.9 GHz band. To allow testing to begin as quickly as possible, SAIC plans to utilize chipsets for the IEEE 802.11(g) technology. This technology will reasonably represent other modulation technologies that may eventually be developed. In the alternative, the public safety community has expressed a desire to be allowed to deploy the 802.11 structure because of its availability and low cost, so 802.11(g) may become the de-facto standard in the band. RF equipment will be either specifically designed by SAIC for operation in the band or will be equipment designed for neighboring bands that is modified to work at 4.9 GHz. In either event, the equipment will be prototype and will not be certified under the FCC's equipment certification rules. SAIC is aware that Section 2.803 of the FCC

rules prohibits offering such equipment for sale. In addition, all prototype equipment will carry the label required by Section 2.803(c) of the rules, which is:

“This device has not been authorized as required by the rules of the Federal Communications Commission. This device is not, and may not be, offered for sale or lease, or sold or leased, until authorization is obtained.

SAIC further acknowledges that operation of this equipment may not cause interference to other authorized services and must accept interference in accordance with the requirements of Section 5.111 of the rules. SAIC plans to work closely with the public safety community in each deployment area to assure that interference will not become an issue.

Technical Details:

SAIC plans to generally follow the technical requirements in Part 90, Subpart Y of the FCC Rules and Regulations. The following is being requested:

Power: Transmitter power output: 2 watts (33 dBm)
Mobile Environment EIRP: 16 watts (42 dBm - assumes a 9 dBi antenna and no line loss - higher gain antennas may be used with a corresponding decrease in transmitter power to maintain 16 watts EIRP)
Fixed point-to-point/multipoint Environment EIRP: 800 watts (59 dBm)
In both the fixed and mobile cases, these power limits conform to Section 90.1215.

Channels: Operation between 4.94 GHz and 4.99 GHz in accordance with the channels defined in Section 90.1213.

Emissions: 22M0G7D or 22M0GXW. In no event will the occupied bandwidth exceed 22.0 MHz.²

Antennas: Antennas will be mounted not higher than 20 feet (6.1 meters) above ground or not more than 20 feet above any man-made structure unless mounted on a tower already in the ASR database or on a tower not requiring registration. Note that for the point-to-point/multipoint antennas, the application shows “0” for beamwidth, horizontal orientation, and vertical orientation. In fact, the answer for each should be “various,” but the electronic filing system did not permit that.

² SAIC is requesting 22M0GXW to permit use of alternative modulation schemes without the need to modify the license for each experimental modulation that may be used. Also, the 802.11(g) emission mask slightly exceeds 20 MHz bandwidth at very low levels, thus SAIC is requesting 22 MHz bandwidth to accommodate the existing chipsets.

Sites:

Site 1: Nationwide for Demonstration, Mobile

Sites 2 & 3: San Diego Area, 80 km around N 33-02-09, W 117-17-08, Mobile/Fixed

Sites 4 & 5: San Jose Area, 80 km around N 37-19-34, W 121-53-53, Mobile/Fixed

Sites 6 & 7: New York Area, 150 km around N 40-47-22, W 73-10-10, Mobile/Fixed

Numbers of Test Units:

Site 1: 200 fixed and 3000 mobile, no more than 10 fixed in any demonstration area.

Sites 2, 4, and 6: 150 fixed and 3000 mobile, each area

Sites 3, 5, and 7: 100 fixed, each area

Conclusion:

SAIC desires to conduct a research and equipment demonstration program designed to maximize the potential of the 4.9 GHz public safety band. No equipment is currently available for the band and much research needs to be conducted in both the RF and data environments. SAIC has the experience and resources to make a meaningful contribution to the state of the art in this band. The requested Experimental License will allow SAIC to deploy and test a variety of 4.9 GHz systems that will ultimately benefit the public safety community. All operations will be conducted on a non-interference basis and operations will be terminated should interference occur. For the above reasons, SAIC respectfully requests grant of the instant application.

If the Commission has any questions, they can be directed to Dr. Daniel, Devasirvatham, SAIC, phone (858) 826-5230, email Daniel.M.Devasirvatham@saic.com.