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To: Anthony Serafini

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Subject: Request for Info - File # 0189-EX-ML-2015

Message:

RESPONSE TO COMMISSION INQUIRY

0189-EX-ML-2015
Reference Number 29464

AeroVironment, Inc. (AV) provides the following response to the Commission's inquiry addressing its application, File # 0189-EX-ML-2015, requesting experimental authorization to use frequency band 1670-1675 MHz at additional sites.

AeroVironment understands and respects the Commission's policies regarding use of the radio spectrum via the Experimental License System. At each site, AV, with an industrial or public sector partner, seeks to discern the viability of using the radio spectrum and a small unmanned aircraft system (SUAS) to stream real time video to provide information. This information is currently either not accessible or is performed through individual labor.

Two core objectives are at stake in the testing. One is the performance of the radio transmission in varied environments- over water, near mountain terrain, in the desert, within industrial or other dense infrastructure and in different climates and weather. The second is whether the application associated is the sector presents video/information of detail and focus is worthwhile to the partner. While not solely a matter of radio technology, integrating applications into radio technology is a critical element of its value and commercial and public sector willingness to invest.

AV does receive reimbursement for some but not all of the testing. The costs associated with the testing exceeds the expenses incurred by AeroVironment to develop the technology and conduct the tests. There are also costs incurred by the partner in participating in the testing. In pursuing partners, AeroVironment does present the history and benefits associated with the technology to possible partners. Yet there are no long term relationships involved; the regulatory environment continues to evolve.

In particular, there is a broader context at stake. The research and information resulting from each site is provided to the Federal Aviation Administration (FAA) and is a critical element of the FAA's congressionally mandated project to integrate SUAS into the national airspace (NAS). Each site seeks to replicate environments where commercial SUAS is envisioned. AeroVironment is aware of no credible testing and research of SUAS commercial operations. The experiments are building a research portfolio showing the SUAS datalink behavior and performance in representative mission sets. The FAA is examining how systems are designed, constructed and manufactured; including the engineering processes, software development and control, configuration management, and quality assurance procedures supporting the aircraft. The FAA will not move to embrace pervasive SUAS presence in the NAS until a record is established showing SUAS operations in multiple environments supporting varied purposes are viable. The testing performed under the Commission's experimental authority is an important facet of this review.

Our plea is for the Commission's understanding that experimental access to spectrum band 1670-1675 MHz is entwined not only with testing, with various industrial and public sectors, the digital data link radio technology, but that this testing is a vital part of a major FAA regulatory proceeding. The proposed additional sites are consistent with this purpose.

Detailed below is a response to the Commission's specific inquiries.

1. How many total locations are you actively testing? How many locations are testing concurrently?

There are 34 sites authorized by WG2XVN. Each site authorizes a station location for mobile and for airborne unmanned aircraft operation (UAV). These sites can be delineated by a particular sector. Each sector has a partner or partners that participate in the testing. The sectors and associated sites are: Railway Bridge and Infrastructure (11), Offshore Oil (2), Power Generation and Grid (2), Agriculture (3), Coal and Uranium Mining (3), Petroleum Production (4), Archeological Exploration (1), Public Safety (2) Military (4), Rolle Field UAV Test Facility (1) and AeroVironment's Design and Testing facility (1).

The length of time associated with each site's testing is significant. The logistics to obtain approval to use airspace, to coordinate with the sector partner, conduct the test, review with the partner and return for further efforts, if necessary, consumes time and resources.

Initial time is consumed by seeking from the FAA a Certificate of Authorization (COA) for a defined parameter of civilian airspace surrounding the site. While the procedure is commenced prior to the obtaining FCC authority, the FAA will not grant a COA without evidence of FCC permission to use specific spectrum. A similar but more streamlined process is pursued with the Department of Defense (DoD) to use military airspace. The FAA and DoD are cooperative and understanding, yet it does take time, subsequent to an FCC grant, to obtain authority to fly the aircraft, a process AeroVironment does not control.

With one exception, all current sites have ongoing testing. What this means is that there are periodic testing, often for several days, to determine whether the SUAS technology can meet the partner's requirements. As several sites are generally associated with one partner, and most are located in extremely rural and isolated areas at substantial distance from each other, time is consumed to travel to and complete the testing for the project. The test results are reviewed by AV and then with the partner. There are circumstances where a return to the site or sites is made to refine and adjust operational performance or to bring focus to particular challenges. Additionally, in one sector, agriculture, the partner seeks to examine the technology throughout the planting, growing and harvest seasons.

The one exception where testing has not commenced is Rolle Field, Arizona. The Rolle Field, Yuma, Arizona site is one of several sites seeking designation by the FAA as a range to test SUAS civilian use. We have not been successful in securing a partner at Rolle Field, we would ask that we be permitted to maintain authority until December 2015, at which time if one does not materialize, we will delete the site.

2. Can any locations be removed from the license as no longer needed?

In our July 2, 2015 modification request, we deleted three sites (6 station locations). Once the experiments are concluded, including resolving any challenges and follow up requests by the partner, we will delete the experimental authorization for the site.

3. Please verify whether you are charging for services or just doing demonstrations. What is the length of operation at each location?

As noted, AeroVironment receives reimbursement from some partners for costs relating to the testing. With other partners, AeroVironment pays for the testing while the partner incurs the costs associated with its efforts. Because of AeroVironment's relationship with the US military, there are more formal and structured arrangements. Overall, the reimbursement received falls far short of the costs associated with the tests and AeroVironment's investment in the technology. As noted above, the actual testing take a period of several days at an individual site, which are part of a broader testing regime involving several sites.

4. What are your plans for future spectrum operations? This band is for testing purposes only.

AeroVironment has pursued with sector partners the possibility of accessing spectrum the partner holds a license to. We also committed significant study to participating in Commission spectrum auction of

spectrum but found pricing prohibited. We have had serious discussions with license holders of spectrum compatible with the SUAS technology. These discussions continue. We are studying various spectrum and technology alternatives evolving in the market. All these efforts are serious and seek to provide a reliable platform for the technology once the regulatory environment emerges.