

STATEMENT ACCOMPANYING REQUEST TO MODIFY EXPERIMENTAL AUTHORIZATION WG2XVN OF AEROVIRONMENT, INC.

1. Introduction

By this application, AeroVironment, Inc. (AeroVironment), requests that the Commission grant a modification to call sign WG2XVN as to sites 55/56 at the Chevron refinery facility in Richmond, California. An adjustment to the center point and an increase of the radius from 8 km to 9.7 km is proposed. No other modifications are requested.

The modification is premised on proposed beyond line of sight (BLOS) tests aligned with the geography and infrastructure of the Chevron facility and surrounding area. These tests will include conducting simulated spill response exercises over and about the adjacent waterways. The Commission's authorization to use the radio spectrum in the manner proposed is a requisite associated with the Federal Aviation Administration's (FAA) review of BLOS operations. Testing will continue to encompass non-BLOS environments.

AeroVironment also asks that the Commission delete Sites 27/28, Modesto, California and Sites 51/52, Firebaugh, CA. Testing at these sites has been completed.

AeroVironment respectfully requests Commission consideration of this modification by October 14, 2016 so that the FAA review process can be timely engaged.

In this statement, we review the modification's purpose and why this application is within the Commission's experimental authorization rules.

2. Purpose

Background

The experiments provide analysis and information as to aerial surveillance of a major petroleum production facility. Since initial authorization at the Richmond site one year ago, refinements have evolved to the real-time full motion video from the small unmanned aircraft system (SUAS) technologies assisting monitoring operations and infrastructure and how best to capture, present and evaluate the data. The Richmond facility is of a size and magnitude significantly larger than other experiments and presents more complex equipment and infrastructure. Premised on models of how best to gather and analyze simulated spill scenarios, the tests will gage SUAS performance. The testing will continue to evaluate the multipath radio propagation challenges the Richmond facility presents.

We have noted previously that the research and information resulting from this work is provided to the FAA in support of its congressionally mandated project to integrate SUAS into civilian airspace. BLOS operations, for which this modification is based, are critical to develop a record demonstrating the safety and effectiveness of commercial SUAS. How the aircraft is able to function to deliver specific objectives within a sector's protocols is only revealed when the

SUAS is tested in an actual mission environment. The FAA examines how a system is designed, constructed and manufactured; including the engineering processes, software development and control, configuration management, and quality assurance procedures supporting the aircraft. Use of the radio spectrum is an integral element of these elements.

3. Technology Use

The experiments continue to embrace a model using a band segment aligning with technology and equipment currently available. AeroVironment reiterates its commitment to operations respecting other users of the band and those in adjacent segments. The limited power levels proposed are part of this commitment. AeroVironment believes the compelling purpose of bringing these advanced services to the refinery sectors serves the public interest. The 1670-1675 MHz channels provide SUAS control and video and telemetry transmission from the SUAS to the ground. Slots are dedicated for uplink data and a downlink.

There will be only one SUAS airborne at any time. Operations will be limited to 400' (121.92 meters) AGL. The SUAS will remain within the radius of the exercise center point. This modification asked that the center point operations be:

NL 37 56 19; WL 122 23 45
Richmond, Contra Costa County, CA
Radius of 9.7 km

4. Nature of Operations

Surface Based and Airborne Transmission

AeroVironment's communications module, Digital Data Link (DDL), uses the 1670-1675 MHz band segment to send ground based command and control data to and from the SUAS and to transmit video and telemetry to the ground control station. The technology, capable of operating within 1625-2390 MHz, requires 4 MHz for full motion video and a 1 MHz channel for video at 15 frames per second. Emission Designators are 4M68G7W and 1M56G7W, respectively, with a transmit power at 10W. Transmission control will be from the surface control station to the SUAS via a laptop or console.

5. Stop Buzzer

Andy Thurling, Chief Test Pilot, Director, Product Safety and Mission Assurance, is available by telephone at 805.581.2198, extension 1892, Cell Phone 805.368.6351 and will act as a "stop buzzer" if any matters involving interference arise during the testing.

6. Transmitting Equipment

The transmitting equipment is unchanged. It is AeroVironment Transreceiver Model 50280, with 2 units at each location. It is not experimental.

7. Antenna

The Antenna details have not changed from the current authorization and are as follows:

Antenna	Gain (Nominal)	Polarization	Orientation in Vertical Plane	Oriental in Horizontal Plane
GCU Antenna ASY AeroVironment Stack Patch	9dbi*	Vertical	30	85
1670-1675 MHz Tailboom ASSY AeroVironment Dipole	2dbi	Vertical	78	360

*Major Side Lobe

- E-Plane
 - Gain: -2 dbi
 - 120 deg
- H- Plane
 - Gain: -2 dbi
 - 179 deg

8. Restrictions on Operations and Interference Protection

AeroVironment understands that experimental operations must not cause harmful interference to authorized facilities. Should any interference occur, AeroVironment will take immediate steps to resolve the interference, including, if necessary, discontinuing operations.

9. Waiver of Station Identification Requirements

AeroVironment requests a waiver of the station identification requirements stated in Section 5.115 of the Commission's rules.

10. Federal Aviation Administration (FAA) Certificate of Waiver Authorization (COA)

AeroVironment will obtain the necessary FAA approval for these operations. AeroVironment understands that no operations will be pursued until FAA approval and that any operations will be within the FAA's parameters.

11. Diagram

A diagram and referenced map of the proposed operations is provided in the attachment.

Conclusion

AeroVironment appreciates very much the Commission's consideration of this modification application for an Experimental Authorization. Please call upon us if we can respond to any questions.

Attachment

Operations Diagram



Small Unmanned Aircraft-

Video and Telemetry
1670-1675 MHz

Aircraft Command and Control Main and
1670-1675 MHz



CONTOUR AND MAP

Latitude *37:56:19 N*

Longitude *122:23:45 W*

Radius *9.7 km*

