

Supporting Statement for Experimental License

For the past two years, researchers from the University of Illinois Center of Excellence for Airport Technology (“CEAT”) and the Port of Seattle have conducted assessment studies of two avian radar systems at Seattle-Tacoma International Airport (SEA) as part of an Federal Aviation Administration (“FAA”) Safety Technology R&D Program (AGP-63).¹ Specifically, the experiment is to develop a radar system capable of observing and tracking bird activities. Such a system will permit the FAA to notify pilots of bird activity to minimize or eliminate aircraft striking of in-flight birds, which can cause serious damage to the aircraft. The system is currently operating under Experimental Authorization WE2XGI.

The comprehensive CEAT performance assessment program conducted with the Port of Seattle considers key issues such as sensor location, radar testing with known targets, data acquisition and management, and data visualization. The insight and practical experiences gained by CEAT teams will be used to determine avian radar capabilities and limitations for potential integration into all airports needing wildlife monitoring and real-time sense and alert functionality.

Each of the radar systems samples different altitudes above ground level to provide avian bird detection performance data as well as information on bird movement dynamics. With this application the Port of Seattle is requesting the addition of one identical experimental avian radar unit. The additional unit, located in the midfield of the airport, 5,300 feet to the northwest of the original radar now under license, will help the Port of Seattle monitor the lower elevations from 0-500 feet, an altitude currently underrepresented even though it is at this altitude that nearly 75% of the bird strikes that cause damage to aircraft occur.

The two transmitters being utilized will both be a Furuno Model FR8252 X-Band, marine radar. The frequency of operation will be 9.410 MHz +/- 30 MHz. The emission type is 60M0P0N, which is a sequence of unmodulated pulses with no encoded information. Pulse duration and repetition rate will depend on the range setting of the radar in nautical miles. The following table applies:

Range Setting in Nautical Miles	Pulse Duration in microseconds	Pulse Repetition Rate in Hertz
0.125 to 1.50	0.08	2100
1.50 to 3.0	0.30	1200
3.0 to 96.0	0.80	600.

The system utilizes two antennas. The first antenna is a six-foot slotted array (Furuno type XN-13A slotted antenna). This antenna has a vertical beamwidth of 22°, a horizontal beamwidth of 1.35°, and a gain of 29 dBi. The second antenna is a two-foot

¹ Federal Aviation Administration Research and Development Program AAR 411.

parabolic dish (Accipiter type HPIM2219 parabolic antenna). It has vertical and horizontal beamwidths of 3.8° and a gain of 32 dBi. Considering a transmitter output power of 25.0 kw, the pulse duration and repetition rates, and the antenna gains, the average power being transmitted is as shown in the following table.

Range Setting in Nautical Miles	Average TPO in Watts	Ant One ERP in kilowatts	Ant Two ERP in kilowatts
0.125 to 1.50	4.2	3.34	6.66
1.50 to 3.0	9.0	7.15	14.26
3.0 to 96.0	12.0	9.53	19.02

The Seattle-Tacoma Airport realizes that operation with an Experimental License is secondary and subject to causing no interference to other authorized services. The Airport also recognizes that because marine radar units are being used, the experimental configuration may not be eligible for permanent licensing under Part 90 of the FCC Rules and Regulations.

The Seattle-Tacoma Airport requests that the Commission grant the application, as submitted.