Environmental Assessment

Applicant's Name (company): FLIR Radars Inc.

Expected Use of Equipment

The Experimentation proposed is to demonstrate the R20SS radar capabilities in various areas in the USA. Demonstrations will typically be conducted for 1 to 3 hours at a time. Frequency of the demonstrations is expected to be in the order of 1 or 2 demonstrations per month.

Equipment Setup

To conduct demonstrations, the R20SS radar will be installed on a tripod with a height from 2 to 6 meters above ground or of an existing building structure. No structure(s) will be built for the purpose of conducting demonstrations under the license being applied for.

Safety Hazard

The R20SS emission characteristics are as follows:

Parameter	Value	Comment
Tx Center frequency	9250 MHz or 9350 MHz or 9450 MHz	The radar can be configured to operate in any of 3 channels. Operation is on one channel at any time.
Bandwidth	100 MHz (short-range mode) 50 MHz (long-range mode)	
RF Output Power	25 W peak 20 W average	
Modulation	Linear FMCW	
Tx Antenna Gain	17 dBi	
Tx Antenna Beamwidths	90 deg azimuth 5.5 deg elevation	Half power
Polarization	Linear Horizontal	

Using the limits for Maximum Permissible Exposure for Occupational/Controlled exposure of 5 mW/cm^2, the safe distance is calculated as follows:

$$R_s = \sqrt{\frac{P\,G}{4\pi\,S}} = 141 \text{ cm}$$

where

S = Power Density (5 mW/cm^2)
P = Power Input to Antenna (25000 mW)
G = Power Gain of Antenna (50.1 or 17 dB)
R_s = Safe distance to center of Antenna

Conclusion

Given that the antenna will be mounted on a tripod 3 to 6 meters above ground or structure, it can be concluded that the RF emissions will not cause safety hazard for personnel in terms of radiation exposure, the safe distance being calculated at 141 cm.

Since the radar is a mobile equipment, no structure or tower will be built and there shall be no environmental impact due to construction.

With the safe distance being 1.41 meter and the expected usage being 2 to 8 hours per month, no significant environmental impact on wildlife is expected from the use of the R20SS radar as a mobile demonstration asset.