§1.1310 and §2.1091 - RF EXPOSURE

According to §1.1307, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for Maximum Permissive Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for Occupational Population/Controlled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f\2\)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

MPE Prediction

Predication of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = power density
      P = power input to antenna
      G = power gain of the antenna in the direction of interest relative to an isotropic radiator
      R = distance to the center of radiation of the antenna

Uplink:

Transmitted with Andrew Decibel Antenna:

Maximum peak output power at antenna input terminal: 44.9 (dBm)
Maximum peak output power at antenna input terminal: 30903 (mW)
Prediction distance: 164 (cm)
Predication frequency: 900 (MHz)
Antenna Gain (typical): 8.15 (dBi)
antenna gain: 6.53 (numeric)
Power density at predication frequency at 164 cm: 0.597 (mW/cm^2)

MPE limit for uncontrolled exposure at prediction frequency: 0.6 (mW/cm^2)

Transmitted with 896-960 Radome Antenna:

Maximum peak output power at antenna input terminal: 44.9 (dBm)
Maximum peak output power at antenna input terminal: 30903 (mW)
Prediction distance: 65 (cm)
Predication frequency: 900 (MHz)
Antenna Gain (typical): 0 (dBi)
antenna gain: 1 (numeric)
Power density at predication frequency at 65 cm: 0.582 (mW/cm^2)

MPE limit for uncontrolled exposure at prediction frequency: 0.6 (mW/cm^2)

Downlink:

Transmitted with Andrew Decibel Antenna:

Maximum peak output power at antenna input terminal: 44.2 (dBm)
Maximum peak output power at antenna input terminal: 26303 (mW)
Prediction distance: 151 (cm)
Predication frequency: 935 (MHz)
Antenna Gain (typical): 8.15 (dBi)
antenna gain: 6.53 (numeric)
Power density at predication frequency at 151 cm: 0.599 (mW/cm^2)

MPE limit for uncontrolled exposure at prediction frequency: 0.57 (mW/cm^2)

Transmitted with 896-960 Radome Antenna:

Maximum peak output power at antenna input terminal: 44.2 (dBm)
Maximum peak output power at antenna input terminal: 26303 (mW)
Prediction distance: 60 (cm)
Predication frequency: 935 (MHz)
Antenna Gain (typical): 0 (dBi)
antenna gain: 1 (numeric)
Power density at predication frequency at 60 cm: 0.58 (mW/cm^2)

MPE limit for uncontrolled exposure at prediction frequency: 0.57 (mW/cm^2)

Test Result

For Uplink, when transmitted with *Andrew Decibel Antenna*, the predicted distance is 164cm.
when transmitted with *896-960 Radome Antenna*, the predicted distance is 65cm.

For Downlink, when transmitted with *Andrew Decibel Antenna*, the predicted distance is 151cm.
when transmitted with *896-960 Radome Antenna*, the predicted distance is 60cm.