1.0 ANSI C95.1 Compliance

Table 1.1: ERP Calculations

Transmit Maximum ERP Calculation	100' Coax Omni Antenna Downlink	100' Coax Dish Antenna Uplink
Total Power for all Channels (Watts)	40.0	2.0
Maximum Antenna Gain (dBd)	10.0	27.3
Minimum TX Foam Cable Loss, 1-5/8" (dB)	1.30	1.30
Minimum TX Jumpers and Adapter Loss (dB)	1.0	1.0
AdaptaSite Remote Radio EIRP (dBm)	55.9	58.0
AdaptaSite Remote Radio EIRP (Watts)	386.3	1037.2
AdaptaSite Remote Radio ERP (dBm)	53.7	60.1
AdaptaSite Remote Radio ERP (Watts)	235.5	632.5

The AdaptaSite Remote Radio is capable of using up to 3 channels at a maximum of 40 Watts each.
EXAMPLE CALCULATION FOR THE OMNI ANTENNA
P is the maximum total power in Watts transmitted by the antenna.
CL is the Cable loss in dB.
JAL is the loss in dB due to jumpers and adapters.
AG is the maximum antenna gain in dBd.

$ERP_{(dBm)} = 10 \cdot Log(P \cdot 1000) - CL - JAL + AG$
$ERP_{(dBm)} = 10 \cdot Log(40 \cdot 1000) - 1.3 - 1.0 + 10$
$ERP_{(dBm)} = 53.7$
$ERP_{(Watts)} = 10^{[\{ERP_{(dBm)} - 30\}/10]}$
$ERP_{(Watts)} = 10^{[\{53.7 - 30\}/10]}$
$ERP_{(Watts)} = 235.5$

$EIRP_{(dBm)} = ERP_{(dBm)} + 2.1$
$EIRP_{(dBm)} = 53.7 + 2.1$
$EIRP_{(dBm)} = 55.9$
$EIRP_{(Watts)} = 10^{[\{EIRP_{(dBm)} - 30\}/10]}$
$EIRP_{(Watts)} = 10^{[\{55.8 - 30\}/10]}$
$EIRP_{(Watts)} = 386.3$

2.0 Maximum Permissible Exposure

In typical installations, the antenna will be mounted to a tower or above a rooftop by a minimum of 10 meters. Since the total power of all channels is less than 1000W ERP (1640W EIRP), compliance testing with the MPE limits of FCC 96-326 is not required.

The limit for Maximum Permissible Exposure (MPE) at the frequency of 1.96 GHz is 6.53 mW/cm^2. For Occupational/Controlled Exposure using the equation Limit = f/300 per FCC 96-326 and 1.31 mW/cm^2 for General Population/Uncontrolled Exposure using the equation Limit = f/300 per FCC 96-326. The EIRP at 1.96 GHz for the AdaptaSite Remote Radio's directional antenna is 1037 Watts; the transmitted power is 2 Watts.

The conversion from power to power density uses the following equation: $PD = P_r G/4\pi r^2$

Where: PD is Power Density (in W/m^2);
P_r is radiated power (in watts);
G is the numeric gain of the antenna; and
r is the distance (in meters) from the antenna.

The conversion from W/m^2 to mW/cm^2 is: $mW/cm^2 = W/m^2/10$

Calculations:

The distance, r, is dependant on Occupational/Controlled Exposure or Population/Uncontrolled Exposure. The following table illustrates the power density for the antennas used on the ARR. These antennas are located at the top of the cell site tower.

At a distance of r = 10 m from the antenna, the power density is as follows:

NOTE: this power density will only be induced on an individual if that individual was physically 10 meters in the main beam of the antenna):

Table 2.1: Power density calculations for MPE

	Uplink Path	Downlink Path
Antenna Gain (dBi)	29.4	12.1
Numeric gain	871.0	16.2
Rated Power (Watts)	2	40
Power Density (W/m^2) @ 10 m	1.39	0.516
Power Density (mW/cm^2) @ 10 m	0.14	0.0516
Minimum distance, in m, for MPE	4.61	2.81

At this power level, an individual would need to be within 5 meters in-line with the main beam of the uplink antenna in order to be at the limit for controlled exposure.

This EUT, at 10 meters away from the transmit antennas, is well within the limits for maximum permissible exposure.