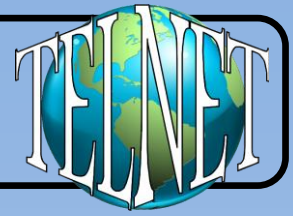


# Electromagnetic Energy (“EME”) Measurement and Site Compliance Report



## Site Information

Site Name: 902 Merrimac  
Address: 902 Merrimac Drive,  
Takoma Park, MD 20912

Report By: Sapna Priya. C  
Reviewed By: Gourav Soni  
Latitude: 38.992436

Report Date: 02/16/2022  
Site Type: Utility Pole  
Longitude: -76.992459

**The equipment at the site will be compliant with FCC guidelines for  
General Population environments if the changes outlined  
in Section 6 of this report are implemented**





## **TABLE OF CONTENT**

<b>1</b>	<b>GENERAL SUMMARY .....</b>	<b>3</b>
<b>2</b>	<b>SITE SCALE MAP .....</b>	<b>4</b>
<b>3</b>	<b>TECHNICAL SPECIFICATIONS .....</b>	<b>5</b>
<b>4</b>	<b>PHOTO .....</b>	<b>6</b>
<b>5</b>	<b>GROUND LEVEL MEASUREMENTS .....</b>	<b>8</b>
<b>6</b>	<b>STATEMENT OF COMPLIANCE .....</b>	<b>9</b>
6.1	SITE ACTIONS REQUIRED .....	9
<b>7</b>	<b>FCC LIMITS FOR MPE.....</b>	<b>10</b>
7.1	(A) LIMITS FOR OCCUPATIONAL/CONTROLLED EXPOSURE .....	10
7.2	(B) LIMITS FOR GENERAL POPULATION/UNCONTROLLED EXPOSURE ...	10
7.3	CONTROLLED AND UNCONTROLLED EXPOSURE LIMITS .....	11
7.4	SAFETY RECOMMENDATIONS .....	12
7.5	ANALYSIS .....	14
	<b>MODELING SUMMARY AND ASSUMPTIONS.....</b>	<b>15</b>
7.5.1	<i>General Model Assumptions.....</i>	<i>15</i>
7.5.2	<i>Use of Generic Antennas.....</i>	<i>15</i>
<b>8</b>	<b>RF SIGNAGE.....</b>	<b>16</b>
	<b>GLOSSARY OF TERMS.....</b>	<b>17</b>



## 1 General Summary

Relevant administrative and compliance-related information about the antenna site area is summarized in the table below:

<b>Site Access</b>	
Access Method	Road
<b>Collocation Status</b>	Not Collocated
<b>Site Area Classification</b>	General Population

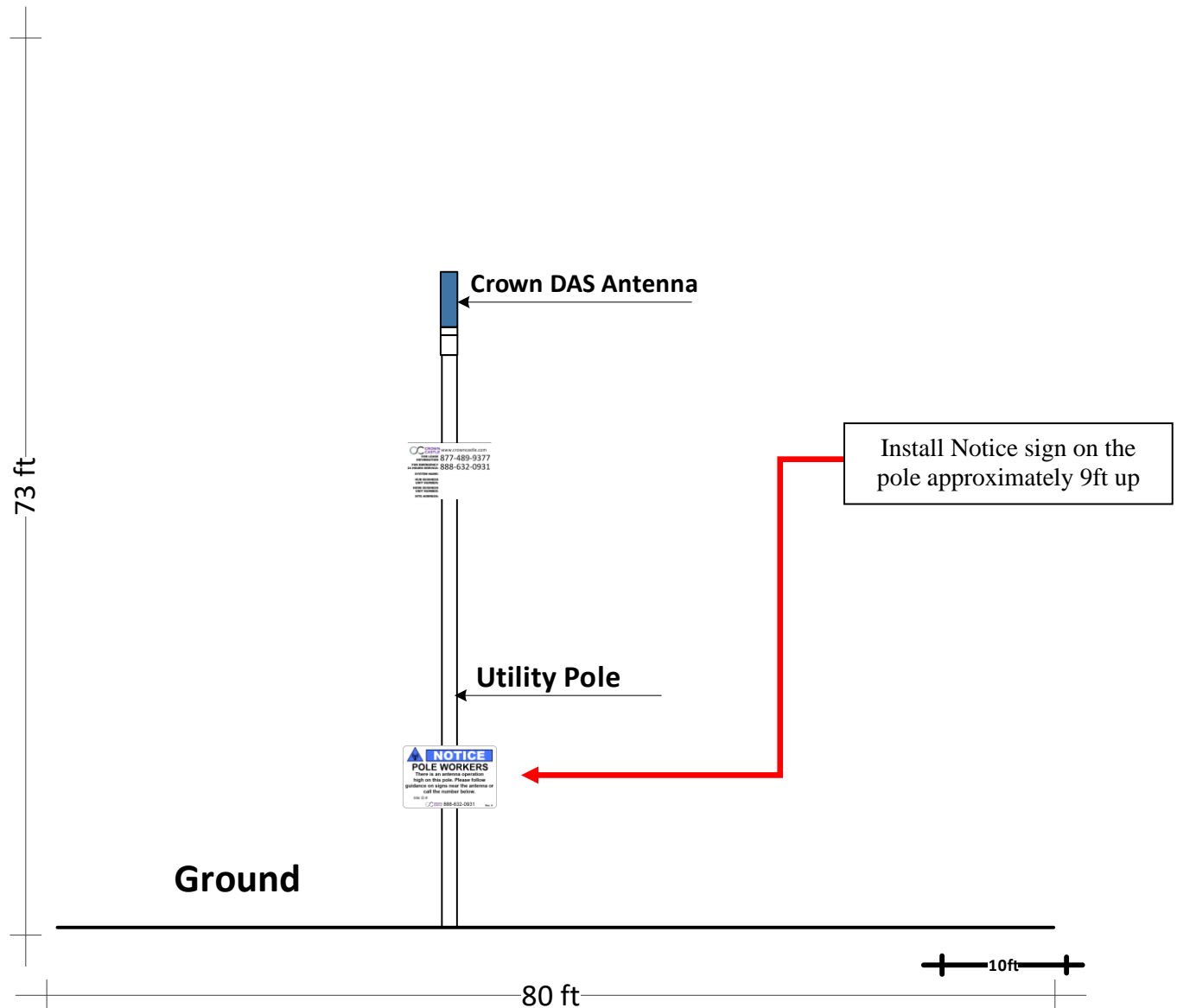
**Table 1**  
**Access Information**

<b>RF details</b>	<b>Summary</b>
Max measured EMF level at Ground level	5.395%
FCC Compliance	Will be compliant if changes are implemented

**Table 2**  
**Survey Summary**



## 2 Site Scale Map



CARRIER ANTENNA:

CROWN CASTLE

TELNET, INC., 7630 Standish Place, Rockville, MD 20855; Phone: 888-883-5638 / Fax: 301-840-0162; Web: www.Telnet-Inc.com

Figure 1  
Proposed Aerial Drawing



### 3 Technical Specifications

The Antenna Inventory shows the technical specifications of the antennas located at the site.

Antenna ID	Antenna Type	Mfg	Model	Azimuth	Aperture (ft)	Height (AGL/ft.)	Carrier
1	Pole	Amphenol	6U4MTSP1X12FxyS0	360	4.02	51.42	Crown Castle

**Table 3**  
**Antenna Inventory**

## 4 Photo







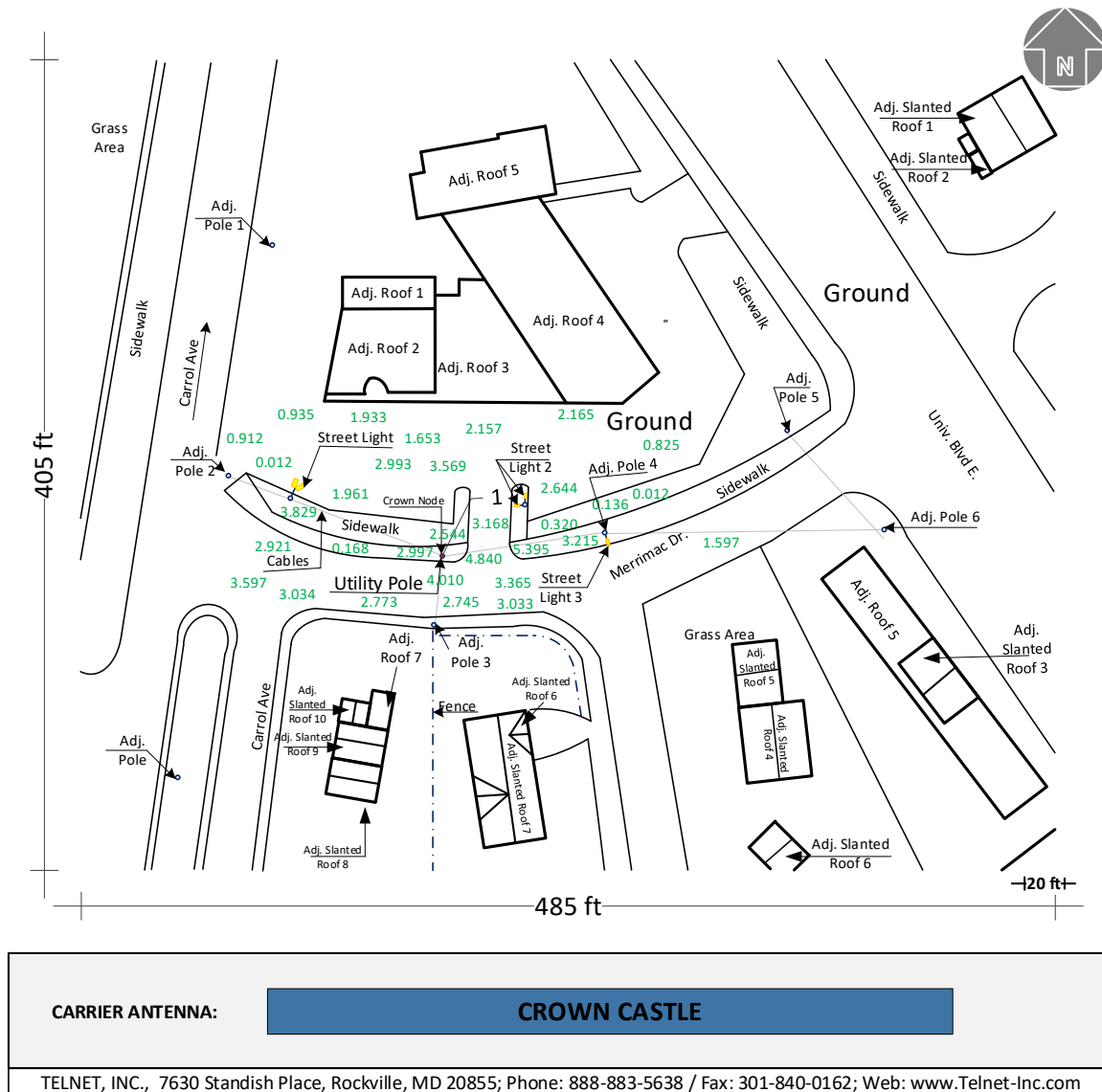


## Field Measurements

### 5 Ground Level Measurements

A RF emissions survey was performed at the wireless telecommunications facility. This survey included walking the sidewalk and street and noting the maximum average spatial readings encountered. The maximum value of the average spatial readings of RF emissions encountered on the ground was 5.395 % of the General standard.

Below is the layout depicting the actual readings (% of the FCC MPE general population Standard limits) at various locations at the site. Various measurements were taken to indicate the RF emissions levels that can be encountered by an individual who gains access to the Utility Pole.



**Figure 8-1. Site Layout**

**Green numbers are the percentages of FCC MPE Limits based on General Population Standards**





## **6 Statement of Compliance**

The equipment at the site will be compliant with FCC guidelines for General Population environments if the following changes are implemented.

### **6.1 Site Actions Required**

#### **Pole**

Install Notice sign on the pole approximately 9ft up.

#### **Antenna #1 Location**

No action required



## Appendix A:

### 7 FCC Limits for MPE

The FCC guidelines for human exposure to RF electromagnetic fields were derived from the recommendations of two expert organizations, the National Council on Radiation Protection and Measurements ("NCRP") and the Institute of Electrical and Electronics Engineers ("IEEE"). The exposure guidelines are based on thresholds for known adverse effects and they incorporate appropriate margin of safety. The federal health and safety agencies such as: the Environmental Protection Agency ("EPA"), the Food and Drug Administration ("FDA"), the National Institute on Occupational Safety and Health ("NIOSH") and the Occupational Safety and Health Administration ("OSHA") have also been actively involved in monitoring and investigating issues related to RF exposure.

The FCC's MPE limits are based on exposure limits over a wide range of frequencies recommended by the NCRP and the exposure limits developed by the IEEE and adopted by the American National Standards Institute ("ANSI") to replace the 1982 ANSI guidelines. The limits for localized absorption are based on the recommendations of both the ANSI/IEEE and the NCRP. The potential hazard associated with the RF electromagnetic fields is discussed in OET Bulletin No. 56 "Questions and Answers about the Biological Effects and Potential Hazards of RF Electromagnetic Fields". This document can be obtained on the FCC website at <http://www.fcc.gov>.

Sections 7.1 and 7.2 represent the FCC limits for both occupational and general population exposures to different radio frequencies:

#### 7.1 (A) Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f <sup>2</sup> )*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

#### 7.2 (B) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	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



NOTE 1: **Occupational/controlled** limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2: **General population/uncontrolled** exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

### 7.3 Controlled and Uncontrolled Exposure Limits

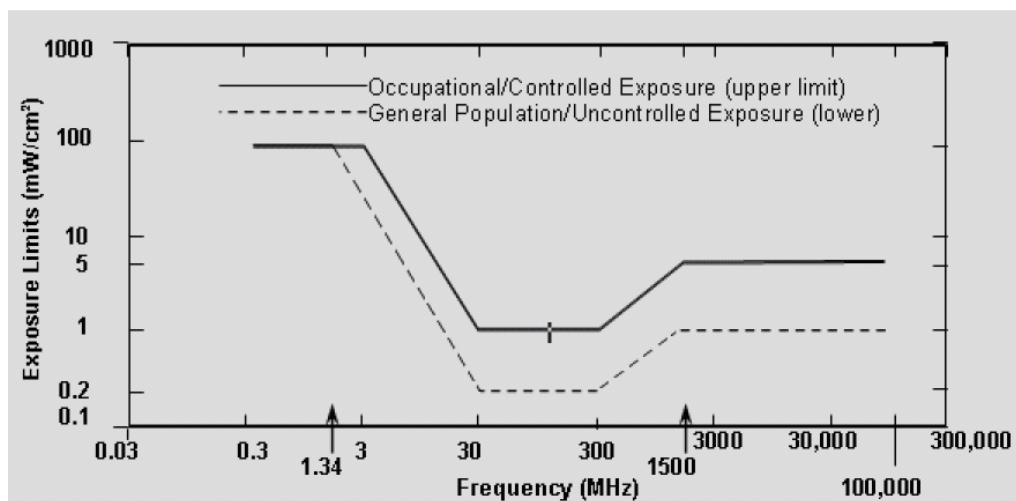


Figure 7



## **7.4 Safety Recommendations**

### **7.4.1 Safety procedures recommendations:**

The following items are general safety recommendations that should be followed on a site according to the carrier's policies which complies with the FCC and OSHA guidelines

#### **7.4.1.1 General Site Work:**

Any maintenance workers obliged to work directly in front of antennas and / or in areas indicated as above 100% of the Occupational MPE limits should coordinate with the wireless operators to turn off transmitters during their work period.

#### **7.4.1.2 EME Awareness Training:**

All persons accessing areas indicated as the limits are above the General Population MPE limits should have a fundamental understanding of EME awareness and RF Safety measures when working around transmitting antennas. Awareness training enhances a workers understanding to potential RF exposure situations. Awareness can be attained in different ways (e.g. videos, formal classroom lecture or internet based courses).



#### **7.4.1.3 Site Access Control:**

Restrictions to access transmitting antennas locations is the major element in a site safety plan. Examples of access restrictions are:

- Locked / Alarmed door or ladder or gate access
- Restrictive Barrier with appropriate RF signage at antenna

#### **7.4.1.4 RF signage:**

RF signs have an important role in appropriately alerting a worker before entering into a potential RF exposure area. All RF signs should be abided by at all times.

#### **7.4.1.5 Active Antennas and Keeping proper distance:**

Always assume an antenna is transmitting. Never stand in front of an antenna. If you have to pass by an antenna, move through as promptly and safely as possible thus reducing any exposure to a minimum. But if you have to stand by an antenna, keep a least a distance of 3 feet clearance from the antenna. The relationship between the strength of an EME field and the distance from the transmitting antenna is inversely proportional, the further away from the antenna, the lesser EME exposure.





## Analysis and Computation

Based on emission patterns of the antennas at this location most of the energy emitted is spread towards the horizon. This assumes the antennas have a zero downtilt. If a mechanical downtilt other than zero is applied to the antennas then the maximum energy emitted will need to be calculated using the information below.

The following formulas can be used for calculating the power density.

Power density is calculated by dividing the surface area of the sphere or the unit area normal to the direction of the propagation. This information is usually shown in units of microwatts per square centimeter (uW/cm<sup>2</sup>), milliwatt per square centimeters (mW/cm<sup>2</sup>), or watts per square meter (W/m<sup>2</sup>).

### 7.5 Analysis

$$S = \frac{(P \times KFact)}{(2\pi Rh)}$$

where :

**S** = power density (mW/cm<sup>2</sup>)

**P** = total power input to the antenna (mW)

**K** = antenna correction factor / numeric factor for antenna discrimination

**R** = straight line distance of the antenna from a 6 ft. human (cm)

**h** = distance between the roof level and the bottom of the antenna (cm) or the vertical distance from the tip of the antenna to the roof level where a 6 ft. human being is assumed standing directly from the antenna (also equal to R at 0)

**MPE%** = Calculated exposure level, as a percentage of the FCC MPE limit for continuous exposure of the general population



## Modeling Summary and Assumptions

### 7.5.1 General Model Assumptions

In this report, it is assumed that all antennas are operating at full power at all times. Software modeling was performed for all transmitting antennas located on the site. Telnet, Inc has further assumed a 100% duty cycle and maximum radiated power.

The site has been modeled with these assumptions to show the maximum RF energy density. Telnet Inc believes this to be a worst case analysis, based on best available data.

If at any time power density measurements were to be made, Telnet Inc believes the real time measurements would indicate levels below those shown in this report. By modeling in this way, we have conservatively shown exclusion areas (areas not to be entered without a personal RF monitor, carriers reducing power or performing real time measurements to show real time exposure levels).

### 7.5.2 Use of Generic Antennas

For the purposes of this report, the use of 'Generic' as an antenna model, or 'Unknown' for a wireless carrier, means that the information about the carrier, their FCC license and/ or antenna information was not provided and could not be obtained while on site. In the event of unknown information, Telnet will use our industry specific knowledge of equipment, antenna models and transmit power to model the site. If more specific information can be obtained for the unknown measurement criteria, remodeling of the site is recommended. If no information is available regarding the transmitting service associated with an unidentified antenna, using the antenna manufacturer's published data regarding the antenna's physical characteristics makes more conservative assumptions.



## 8 RF Signage

Areas or portions of any transmitter site may be susceptible to high power densities that could cause personnel exposures in excess of the FCC guidelines. These areas must be demarcated by conspicuously posted signage that identifies the potential exposure. Signage MUST be viewable regardless of the viewer's position. In each sign the safe distance to hotspot zones are explained.



### INFORMATION

RF exposure at this site does not exceed the FCC public exposure standard and no special precautions are required for work near antennas.

For more information call the number below.

Site ID #



888-632-0931

Rev. A

N/A



### NOTICE

## POLE WORKERS

There is an antenna operation high on this pole. Please follow guidance on signs near the antenna or call the number below.

Site ID #



888-632-0931

Rev. A

Notice sign at the pole approximately 9ft up



### CAUTION

Keep Back \_\_\_\_ FT From this Antenna. FCC RF Public Exposure Limits May Be Exceeded Within This Distance. Call 888-632-0931 for Instructions.

Qualified Workers: FCC Occupational Limits May Be Exceeded Within This Distance.

Site ID #

Rev. A

N/A



## Appendix B

The Table below indicates Percentage of contribution to the General Populations limits and the Percentage of contribution to the Occupational limits at ground level for each of the wireless carriers mentioned below, and also the Percentage of contribution to the Occupational limits at the face of the antenna.

Carrier	Ground – MPE Level General Populations %
Crown Castle	5.4%

## Glossary of Terms

1. *Electromagnetic Field (energy density)* – the electromagnetic energy contained in an infinitesimal volume divided by that volume.
2. *Exposure* – Exposure occurs whenever and wherever a person is subjected to electric, magnetic or electromagnetic fields other than those originating from physiological processes in the body and other natural phenomena.
3. *General Population / Uncontrolled Exposure* – applies to human exposure to RF fields when the general public is exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public always fall under this category when exposure is not employment-related.
4. *Maximum Permissible Exposure (MPE)* – the rms and peak electric and magnetic field strength, their squares, or the plane-wave equivalent power densities associated with these fields to which a person may be exposed without harmful effect and with an acceptable safety factor.
5. *Occupational / Controlled Exposure* – applies to human exposure to RF fields when persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/controlled limits.
6. *Power Density (S)* – Power per unit area normal to the direction of propagation, usually expressed in units of watts per square meter ( $W/m^2$ ) or, for convenience, units such as milliwatts per square centimeter ( $mW/cm^2$ ) or microwatts per square centimeter ( $\mu W/cm^2$ ).
7. *Ionization* – a process by which electrons are stripped from atoms and molecules. This process can produce molecular changes that can lead to damage in biological tissue, includes effect on DNA, the genetic material. This process requires interaction with high levels of electromagnetic energy.
8. *Non-ionizing radiation* – a type of emission that is not great enough to cause ionization of atom and molecules. “RF and Microwave Emissions” are low-level energy which are not capable of ionization.