EXHIBIT A – APPLICATION SUMMARY

1.0 - Description of Application

The instant modification application seeks to add three (3) transmitting antennas to Call Sign E050018. Specifically, NewCom International, Inc ("NewCom") seeks to add a General Dynamics SATCOM Technologies (previously Vertex/RSI) 8.1 meter GD8.1 antenna ("ES 4Ku), General Dynamics SATCOM Technologies (previously Prodelin) 3.8 meter Series 1383 3.8 antenna ("ES 5Ku"), and ASC Signal (previously Andrew Corp.) 4.5 meter ES45MP-1 ("ES 6Ku") to the aforementioned earth station.[1] NewCom seeks authority to operate the ES 4Ku, ES 5Ku and ES 6Ku exclusively in the Ku-band. NewCom does not seek to modify any of the technical or carrier parameters related to any existing antenna operating under Call Sign E050018.

2.0 - Exhibit Table of Contents

Exhibit	Description	Total Pages
Exhibit A	Application Summary & Exhibit Table of Contents	1
Exhibit B	FAA Notification	1
Exhibit C	Radiation Hazard Study ES 4Ku	6
Exhibit D	Radiation Hazard Study ES 5Ku	6
Exhibit E	Radiation Hazard Study ES 6Ku	6

[1] The ES 4Ku, ES 5Ku and ES 6Ku will be located within one (1) second longitude and latitude of the existing coordinates for Call Sign E050018.

EXHIBIT B – FAA NOTIFICATION

Pursuant to 47. C.F.R. §17.14 (a) and (b), FAA notification is not necessary because (1) the proposed 3.8 meter, 4.5 meter and 8.1 meter antennas will be shielded by existing permanent structures of a substantial character, and (2) because the antennas will be located in a heavily congested area of Miami where they will not adversely affect safety in air navigation.

EXHIBIT C – RADIATION HAZARD STUDIES

1.0 Introduction

NewCom International ("NewCom") intends to deploy a transmit/receive 8.1m antenna at its flagship teleport in Miami, Florida. This fixed satellite antenna has 59.7 dBi gain, and will be equipped with a 350 Watt transceiver. Maximum output from the transceiver will be limited to 300 Watt and EIRP will not exceed 81.5 dBW.

2.0 Antenna Analysis Method

This report is developed in accordance with the prediction methods contained in OET Bulletin No. 65, Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields, Edition 97-01, pp 26-30. The maximum level of non-ionizing radiation to which employees may be exposed is limited to a power density level of 5 milliwatts per square centimeter (5 mW/cm2) averaged over any 6 minute period in a controlled environment and the maximum level of non-ionizing radiation to which the general public is exposed is limited to a power density level of 1 milliwatt per square centimeter (1 mW/cm2) averaged over any 30 minute period in a uncontrolled environment. These calculations demonstrate that the radiation levels associated with NewCom's short-term testing are within acceptable limits when compared to the levels established for Maximum Permissible Exposure ("MPE") defined in Bulletin 65, Appendix A for Occupational/Controlled Limits and General Population/Uncontrolled Limits.

3.1 8.1m Antenna Specifications

The proposed antenna is a Vertex 8.1m transmit/receive antenna equipped with a 350 Watt transceiver. The parameters for this antenna are shown in the table below.

Antenna Actual Diameter	**8.1m meters**
Antenna Surface Area	**51.53 sq. meters**
Antenna Isotropic Gain	**59.7 dBi**
Number of Identical Adjacent Antennas*	**0**
Nominal Antenna Efficiency (η)	**64.16 %**
Nominal Frequency	**14250 MHz**
Nominal Wavelength (λ)	**0.0211 meters**
Maximum Transmit Power / Carrier	**300 Watts**
Number of Carriers	**1**
Total Transmit Power	**300 Watts**
W/G Loss from Transmitter to Feed	**3 dB**
Total Feed Input Power	**150 Watts**
Near Field Limit	$R_{nf} = D^2/4\lambda = 777.37$ **meters**
Far Field Limit	$R_{ff} = 0.6\ D^2/\lambda = 1865.69$ **meters**
Transition Region	R_{nf} **to** R_{ff}

Note that the worst-case radiation hazards exist along the beam axis. Under normal circumstances, it is highly unlikely that the antenna axis will be aligned with any occupied area since that would represent a blockage to the desired signals, thus rendering the link unusable.

In the following sections, the power density in the above regions, as well as other critically important areas will be calculated and evaluated. The calculations are done in the order discussed in OET Bulletin 65.

3.2 Main Reflector Region

The power density at the reflector surface can be calculated from the expression:

PD_{refl} = 4P/A = 1.16 mW/cm² (1)

Where: P = total power at feed, milliwatts

A = Total area of reflector, sq. cm

In the normal range of transmit powers for this satellite antenna, the power densities at or around the reflector surface are expected to exceed safe levels. Please note that precautionary measures will be taken during the individual installations of the antenna to ensure that this area will be inaccessible to the general public. Operators and technicians have received training specifying this area as a high exposure area. Furthermore, procedures have been established that ensure all transmitters are turned off before access to this area by maintenance personnel is possible.

3.3 On-Axis Near Field Region

The geometrical limits of the radiated power in the near field approximate a cylindrical volume with a diameter equal to that of the antenna. In the near field, the power density is neither uniform nor does its value vary uniformly with distance from the antenna. For the purpose of considering radiation hazard it is assumed that the on-axis flux density is at its maximum value throughout the length of this region. The length of this region, i.e., the distance from the antenna to the end of the near field, is computed as Rnf above.

The power density within the on-axis near field region can be calculated from the expression:

$PD_{nf} = (16\ \eta\ P)/(\pi\ D^2)$ = 0.75 mW/cm² (2)

from 0 to 777.37 meters

Evaluation

Uncontrolled Environment: Complies to FCC Limits *

Controlled Environment: Complies to FCC Limits *

* Power Density Limit for Controlled and Uncontrolled Environment is met in the Near Field Region.

3.4 On-Axis Transition Field Region

The transition region is located between the near and far field regions. As stated in Bulletin 65, the power density begins to vary inversely with distance in the transition region. The maximum power density in the transition region will not exceed that calculated for the near field region, and the transition region begins at that value. The maximum value for a given distance within the transition region may be computed for the point of interest according to:

We use the equation below (3) to determine the safe on-axis distances required for the two occupancy conditions:

PD_t =	**$(PD_{nf})(R_{nf})/R$ = dependent on R (3)** **=0.75 mW/cm² at R = 777.37 m**
where:	**PD_{nf} = near field power density**
	R_{nf} = near field distance
	R = distance to point of interest
For:	**$777.37 < R < 1865.69$ meters**

Evaluation

Uncontrolled Environment Safe Operating Distance,(meters), R_{safeu}:	**777.37 m ****
Controlled Environment Safe Operating Distance,(meters), R_{safec}:	**777.37 m ****

** Power Density Limit for Controlled and Uncontrolled Environments is met in the Transition Field Region.

3.5 On-Axis Far-Field Region

The on- axis power density in the far field region (PD_{ff}) varies inversely with the square of the distance as follows:

We use the equation below (4) to determine the safe on-axis distances required for the two occupancy conditions:

PD_{ff} =	**$PG/(4\pi R^2)$ = dependent on R (4)**
where:	**P = total power at feed**
	G = Numeric Antenna gain in the direction of interest relative to isotropic radiator
	R = distance to the point of interest
For:	**$R > R_{ff}$ = 1865.69 meters**
	PD_{ff} = 0.32 mW/cm² at R_{ff}

Evaluation

Uncontrolled Environment Safe Operating Distance,(meters), R_{safeu}:	**1865.69 m**
Controlled Environment Safe Operating Distance,(meters), R_{safec}:	**1865.69 m**

3.6 Off-Axis Far-Field Region

In the far field region power is distributed in a pattern of maxima and minima (sidelobes) as a function of the off-axis angle between the antenna center line and the point of interest. Off-axis power density in the far field can be estimated using the antenna radiation patterns prescribed for the antenna in use. Usually this will correspond to the antenna gain pattern envelope defined by the FCC or the ITU, which takes the form of:

$G_{off} = 32 - 25\log(\Theta)$ (5)
for Θ from 1 to 48 degrees; -10 dBi from 48 to 180 degrees
(Applicable for commonly used satellite transmit antennas)

Considering that satellite antenna beams are aimed skyward, power density in the far field will usually not be a problem except at low look angles. In these cases, the off axis gain reduction may be used to further reduce the power density levels.

For example: At one (1) degree off axis at the far-field limit, we can calculate the power density as:

$G_{off} = 32 - 25\log(1) = 32 - 0$ dBi = 1585 numeric

Evaluation
$PD_{1\ deg\ off\text{-}axis} = PD_{ff} \times 1585/G = 0.00054$ mW/cm²

3.7 Off-Axis Power Density in the Near-Field and Transitional Region

According to Bulletin 65, off-axis calculations in the near field may be performed as follows: assuming that the point of interest is at least one antenna diameter removed from the center of the main beam, the power density at that point is at least a factor of 100 (20 dB) less than the value calculated for the equivalent on-axis power density in the main beam. Therefore, for regions at least 8.1 meters away from the center line of the dish, whether behind, below, or in front under of the antenna's main beam, the power density exposure is at least 20 dB below the main beam level as follows:

$PD_{nf(off\text{-}axis)} = PD_{nf} /100 = 0.0075$ mW/cm² at D off axis (6)

Evaluation of Safe Occupancy Area in Front of Antenna

The safe distance (S) from a vertical axis passing through the dish center to a safe off axis location in front of the antenna can be determined based on the dish diameter rule above (6). Assuming a flat terrain in front of the antenna, the relationship is:

S = (D/ sin α) + (2h - D - 2)/(2 tan α) (7)

Where: α = minimum elevation angle of antenna
D = dish diameter in meters
h = maximum height of object to be cleared, meters

For distances equal or greater than determined by equation (7), the radiation hazard will be below safe levels for all but the most powerful stations (> 4 kilowatts RF at the feed).

For D = 8.1 meters
h = 1 meter

Then:

α	S
10	23.68 meters
15	16.18 meters
20	12.56 meters
25	10.48 meters
30	9.18 meters
35	8.34 meters
45	7.40 meters

4.0 Expected Radiation Levels

Region / Antenna	Antenna Surface Area (mW/cm^2)	Near Field Dist. (m) (mW/cm2)	Far Field Dist. (m) (mW/cm2)	Transition (Midpoint) Dist. (m) (mW/cm2)
8.1 m / 150 W BUC		777.37	1865.69	1321.53
	1.16	0.75	0.32	0.44

5.0 Conclusions

Based on the above analysis, it is concluded that harmful levels of radiation will not exist in regions normally occupied by the public or the antenna's operating personnel. It is still recommended that all personnel be trained in RF safety when working around or maintaining this type of antenna. Furthermore, it will be stressed that transmitters always be turned off during maintenance in accordance with standard operating procedures.

EXHIBIT D – RADIATION HAZARD STUDY

1.0 Introduction

NewCom International ("NewCom") intends to deploy a transmit/receive 3.8m antenna at its flagship teleport in Miami, Florida. This fixed satellite antenna has 53.2 dBi gain, and will be equipped with a 20 Watt transceiver. Maximum output from the transceiver will be limited to 20 Watt and EIRP will not exceed 65.96 dBW.

2.0 Antenna Analysis Method

This report is developed in accordance with the prediction methods contained in OET Bulletin No. 65, Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields, Edition 97-01, pp 26-30. The maximum level of non-ionizing radiation to which employees may be exposed is limited to a power density level of 5 milliwatt per square centimeter (5 mW/cm2) averaged over any 6 minute period in a controlled environment and the maximum level of non-ionizing radiation to which the general public is exposed is limited to a power density level of 1 milliwatt per square centimeter (1 mW/cm2) averaged over any 30 minute period in a uncontrolled environment. These calculations demonstrate that the radiation levels associated with NewCom's short-term testing are within acceptable limits when compared to the levels established for Maximum Permissible Exposure ("MPE") defined in Bulletin 65, Appendix A for Occupational/Controlled Limits and General Population/Uncontrolled Limits.

3.1 3.8m Antenna Specifications

The proposed antenna is a Prodelin 1383 Series transmit/receive antenna equipped with a 20 Watt transceiver. The parameters for this antenna are shown in the table below.

Antenna Actual Diameter	**3.80 meters**
Antenna Surface Area	**11.34 sq. meters**
Antenna Isotropic Gain	**53.2 dBi**
Number of Identical Adjacent Antennas*	**0**
Nominal Antenna Efficiency (η)	**65 %**
Nominal Frequency	**14250 MHz**
Nominal Wavelength (λ)	**0.0211 meters**
Maximum Transmit Power / Carrier	**20 Watts**
Number of Carriers	**1**
Total Transmit Power	**20 Watts**
W/G Loss from Transmitter to Feed	**0.25 dB**
Total Feed Input Power	**18.88 Watts**
Near Field Limit	$R_{nf} = D^2/4\lambda = 171.1$ **meters**
Far Field Limit	$R_{ff} = 0.6\ D^2/\lambda = 410.6$ **meters**
Transition Region	R_{nf} **to** R_{ff}

Note that the worst-case radiation hazards exist along the beam axis. Under normal circumstances, it is highly unlikely that the antenna axis will be aligned with any occupied area since that would represent a blockage to the desired signals, thus rendering the link unusable.

In the following sections, the power density in the above regions, as well as other critically important areas will be calculated and evaluated. The calculations are done in the order discussed in OET Bulletin 65.

3.2 Main Reflector Region

The power density at the reflector surface can be calculated from the expression:

PD_{refl} = 4P/A = 0.666 mW/cm² (1)

Where: P = total power at feed, milliwatts
A = Total area of reflector, sq. cm

In the normal range of transmit powers for this satellite antenna, the power densities at or around the reflector surface are expected not to exceed safe levels. Even though, precautionary measures will be taken during the individual installations of the antenna to ensure that this area will be inaccessible to the general public. Operators and technicians have received training specifying this area as a high exposure area. Furthermore, procedures have been established that ensure all transmitters are turned off before access to this area by maintenance personnel is possible.

3.3 On-Axis Near Field Region

The geometrical limits of the radiated power in the near field approximate a cylindrical volume with a diameter equal to that of the antenna. In the near field, the power density is neither uniform nor does its value vary uniformly with distance from the antenna. For the purpose of considering radiation hazard it is assumed that the on-axis flux density is at its maximum value throughout the length of this region. The length of this region, i.e., the distance from the antenna to the end of the near field, is computed as Rnf above.

The power density within the on-axis near field region can be calculated from the expression:

$PD_{nf} = (16\,\eta\,P)/(\pi\,D^2)$ = 0.433 mW/cm² (2)
from 0 to 171.1 meters

Evaluation
Uncontrolled Environment: Complies to FCC Limits *
Controlled Environment: Complies to FCC Limits *

* Power Density Limit for Controlled and Uncontrolled Environment is met in the Near Field Region.

3.4 On-Axis Transition Field Region

The transition region is located between the near and far field regions. As stated in Bulletin 65, the power density begins to vary inversely with distance in the transition region. The maximum power density in the transition region will not exceed that calculated for the near field region, and the transition region begins at that value. The maximum value for a given distance within the transition region may be computed for the point of interest according to:

We use the equation below (3) to determine the safe on-axis distances required for the two occupancy conditions:

PD_t =	**$(PD_{nf})(R_{nf})/R$ = dependent on R (3)** **= 0.433 mW/cm² at R = 171.1 m**
where:	**PD_{nf} = near field power density**
	R_{nf} = near field distance
	R = distance to point of interest
For:	**171.1 < R < 410.6 meters**

Evaluation	
Uncontrolled Environment Safe Operating Distance,(meters), R_{safeu}:	**171.1 m ****
Controlled Environment Safe Operating Distance,(meters), R_{safec}:	**171.1 m ****

** Power Density Limit for Controlled and Uncontrolled Environments is met in the Transition Field Region.

3.5 On-Axis Far-Field Region

The on- axis power density in the far field region (PD_{ff}) varies inversely with the square of the distance as follows:

We use the equation below (4) to determine the safe on-axis distances required for the two occupancy conditions:

PD_{ff} =	**$PG/(4\pi R^2)$ = dependent on R (4)**
where:	**P = total power at feed**
	G = Numeric Antenna gain in the direction of interest relative to isotropic radiator
	R = distance to the point of interest
For:	**$R > R_{ff}$ = 410.6 meters**
	PD_{ff} = 0.186 mW/cm² at R_{ff}

Evaluation	
Uncontrolled Environment Safe Operating Distance,(meters), R_{safeu}:	**410.6 m**

Controlled Environment Safe Operating Distance,(meters), R_{safec}:	**410.6 m**

3.6 Off-Axis Far-Field Region

In the far field region power is distributed in a pattern of maxima and minima (sidelobes) as a function of the off-axis angle between the antenna center line and the point of interest. Off-axis power density in the far field can be estimated using the antenna radiation patterns prescribed for the antenna in use. Usually this will correspond to the antenna gain pattern envelope defined by the FCC or the ITU, which takes the form of:

$G_{off} = 32 - 25\log(\Theta)$ (5)
for Θ from 1 to 48 degrees; -10 dBi from 48 to 180 degrees
(Applicable for commonly used satellite transmit antennas)

Considering that satellite antenna beams are aimed skyward, power density in the far field will usually not be a problem except at low look angles. In these cases, the off axis gain reduction may be used to further reduce the power density levels.

For example: At one (1) degree off axis At the far-field limit, we can calculate the power density as:

$G_{off} = 32 - 25\log(1) = 32 - 0$ dBi = 1585 numeric

Evaluation
$PD_{1\ deg\ off\text{-}axis} = PD_{ff} x\ 1585/G = 0.00141\ mW/cm^2$

3.7 Off-Axis Power Density in the Near-Field and Transitional Region

According to Bulletin 65, off-axis calculations in the near field may be performed as follows: assuming that the point of interest is at least one antenna diameter removed from the center of the main beam, the power density at that point is at least a factor of 100 (20 dB) less than the value calculated for the equivalent on-axis power density in the main beam. Therefore, for regions at least 3.8 meters away from the center line of the dish, whether behind, below, or in front under of the antenna's main beam, the power density exposure is at least 20 dB below the main beam level as follows:

$PD_{nf(off\text{-}axis)} = PD_{nf}/100 = 0.00433\ mW/cm^2$ at D off axis (6)

Evaluation of Safe Occupancy Area in Front of Antenna

The safe distance (S) from a vertical axis passing through the dish center to a safe off axis location in front of the antenna can be determined based on the dish diameter rule above (6). Assuming a flat terrain in front of the antenna, the relationship is:

$S = (D/\sin\alpha) + (2h - D - 2)/(2\tan\alpha)$ (7)

Where: α = **minimum elevation angle of antenna**

D = dish diameter in meters

h = maximum height of object to be cleared, meters

For distances equal or greater than determined by equation (7), the radiation hazard will be below safe levels for all but the most powerful stations (> 4 kilowatts RF at the feed).

For	**D =**	**3.8 meters**
	h =	**1 meter**

Then:

α	**S**
10	**11.1 meters**
15	**7.6 meters**
20	**5.9 meters**
25	**4.9 meters**
30	**4.3 meters**
35	**3.9 meters**
45	**3.5 meters**

4.0 Expected Radiation Levels

Region / Antenna	Antenna Surface Area (mW/cm^2)	Near Field Dist. (m) (mW/cm2)	Far Field Dist. (m) (mW/cm2)	Transition (Midpoint) Dist. (m) (mW/cm2)
3.8 m / 18.88 W BUC		171.1	410.6	290.8
	0.666	0.433	0.186	0.255

5.0 Conclusions

Based on the above analysis, it is concluded that harmful levels of radiation will not exist in regions normally occupied by the public or the antenna's operating personnel. It is still recommended that all personnel be trained in RF safety when working around or maintaining this type of antenna. Furthermore, it will be stressed that transmitters always be turned off during maintenance in accordance with standard operating procedures.

Analysis of Non-Ionizing Radiation for a 4.5-Meter Earth Station System

This report analyzes the non-ionizing radiation levels for a 4.5-meter earth station system. The analysis and calculations performed in this report comply with the methods described in the FCC Office of Engineering and Technology Bulletin, No. 65 first published in 1985 and revised in 1997 in Edition 97-01. The radiation safety limits used in the analysis are in conformance with the FCC R&O 96-326. Bulletin No. 65 and the FCC R&O specifies that there are two separate tiers of exposure limits that are dependant on the situation in which the exposure takes place and/or the status of the individuals who are subject to the exposure. The Maximum Permissible Exposure (MPE) limits for persons in a General Population/Uncontrolled environment are shown in Table 1. The General Population/Uncontrolled MPE is a function of transmit frequency and is for an exposure period of thirty minutes or less. The MPE limits for persons in an Occupational/Controlled environment are shown in Table 2. The Occupational MPE is a function of transmit frequency and is for an exposure period of six minutes or less. The purpose of the analysis described in this report is to determine the power flux density levels of the earth station in the far-field, near-field, transition region, between the subreflector or feed and main reflector surface, at the main reflector surface, and between the antenna edge and the ground and to compare these levels to the specified MPEs.

Table 1. Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Power Density (mW/cm^2)
30-300	0.2
300-1500	Frequency (MHz)*(0.8/1200)
1500-100,000	1.0

Table 2. Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Power Density (mW/cm^2)
30-300	1.0
300-1500	Frequency (MHz)*(4.0/1200)
1500-100,000	5.0

Table 3. Formulas and Parameters Used for Determining Power Flux Densities

Parameter	Symbol	Formula	Value	Units
Antenna Diameter	D	Input	4.5	m
Antenna Surface Area	$A_{surface}$	$\pi D^2 / 4$	15.90	m^2
Feed Flange Diameter	D_{fa}	Input	19.4	cm
Area of Feed Flange	A_{fa}	$\pi D_{fa}{}^2/4$	296.81	cm^2
Frequency	F	Input	14250	MHz
Wavelength	λ	300 / F	0.021053	m
Transmit Power	P	Input	125.00	W
Antenna Gain (dBi)	G_{es}	Input	53.9	dBi
Antenna Gain (factor)	G	$10^{Ges/10}$	245470.9	n/a

Pi	π	Constant	3.1415927	n/a
Antenna Efficiency	η	$G\lambda^2/(\pi^2 D^2)$	0.54	n/a

1. Far Field Distance Calculation

The distance to the beginning of the far field can be determined from the following equation:

Distance to the Far Field Region $R_{ff} = 0.60\ D^2 / \lambda$ (1)
$= 577.1$ m

The maximum main beam power density in the far field can be determined from the following equation:

On-Axis Power Density in the Far Field $S_{ff} = G\ P / (4\ \pi\ R_{ff}^{\ 2})$ (2)
$= 7.331$ W/m^2
$= 0.733$ mW/cm^2

2. Near Field Calculation

Power flux density is considered to be at a maximum value throughout the entire length of the defined Near Field region. The region is contained within a cylindrical volume having the same diameter as the antenna. Past the boundary of the Near Field region, the power density from the antenna decreases linearly with respect to increasing distance.

The distance to the end of the Near Field can be determined from the following equation:

Extent of the Near Field $R_{nf} = D^2 / (4\ \lambda)$ (3)
$= 240.5$ m

The maximum power density in the Near Field can be determined from the following equation:

Near Field Power Density $S_{nf} = 16.0\ \eta\ P / (\pi\ D^2)$ (4)
$= 17.114$ W/m^2
$= 1.711$ mW/cm^2

3. Transition Region Calculation

The Transition region is located between the Near and Far Field regions. The power density begins to decrease linearly with increasing distance in the Transition region. While the power density decreases inversely with distance in the Transition region, the power density decreases inversely with the square of the distance in the Far Field region. The maximum power density in the Transition region will not exceed that calculated for the Near Field region. The power density calculated in Section 1 is the highest power density the antenna can produce in any of the regions away from the antenna. The power density at a distance R_t can be determined from the following equation:

Transition Region Power Density $S_t = S_{nf} R_{nf} / R_t$ (5)

$= 1.711\ mW/cm^2$

4. Region between the Feed Assembly and the Antenna Reflector

Transmissions from the feed assembly are directed toward the antenna reflector surface, and are confined within a conical shape defined by the type of feed assembly. The most common feed assemblies are waveguide flanges, horns or subreflectors. The energy between the feed assembly and reflector surface can be calculated by determining the power density at the feed assembly surface. This can be determined from the following equation:

Power Density at the Feed Flange $S_{fa} = 4000\ P / A_{fa}$ (6)
$= 1684.564\ mW/cm^2$

5. Main Reflector Region

The power density in the main reflector is determined in the same manner as the power density at the feed assembly. The area is now the area of the reflector aperture and can be determined from the following equation:

Power Density at the Reflector Surface $S_{surface} = 4\ P / A_{surface}$ (7)
$= 31.438\ W/m^2$
$= 3.144\ mW/cm^2$

6. Region between the Reflector and the Ground

Assuming uniform illumination of the reflector surface, the power density between the antenna and the ground can be determined from the following equation:

Power Density between Reflector and Ground $S_g = P / A_{surface}$ (8)
$= 7.860\ W/m^2$
$= 0.786\ mW/cm^2$

7. Summary of Calculations

Table 4. Summary of Expected Radiation levels for Uncontrolled Environment

Region	Calculated Maximum Radiation Power Density Level (mW/cm^2)		Hazard Assessment
1. Far Field (R_{ff} = 577.1 m)	S_{ff}	0.733	Satisfies FCC MPE
2. Near Field (R_{nf} = 240.5 m)	S_{nf}	1.711	Potential Hazard
3. Transition Region ($R_{nf} < R_t < R_{ff}$)	S_t	1.711	Potential Hazard
4. Between Feed Assembly and Antenna Reflector	S_{fa}	1684.564	Potential Hazard
5. Main Reflector	$S_{surface}$	3.144	Potential Hazard
6. Between Reflector and Ground	S_g	0.786	Satisfies FCC MPE

Table 5. Summary of Expected Radiation levels for Controlled Environment

Region	Calculated Maximum Radiation Power Density Level (mW/cm^2)		Hazard Assessment
1. Far Field (R_{ff} = 577.1 m)	S_{ff}	0.733	Satisfies FCC MPE
2. Near Field (R_{nf} = 240.5 m)	S_{nf}	1.711	Satisfies FCC MPE
3. Transition Region ($R_{nf} < R_t < R_{ff}$)	S_t	1.711	Satisfies FCC MPE
4. Between Feed Assembly and Antenna Reflector	S_{fa}	1684.564	Potential Hazard
5. Main Reflector	$S_{surface}$	3.144	Satisfies FCC MPE
6. Between Reflector and Ground	S_g	0.786	Satisfies FCC MPE

It is the applicant's responsibility to ensure that the public and operational personnel are not exposed to harmful levels of radiation.

8. Conclusions

Based on the above analysis it is concluded that the FCC MPE guidelines have been exceeded (or met) in the regions of Table 4 and 5. The applicant proposes to comply with the MPE limits by one or more of the following methods.

The earth station will be located in a Gated and Fenced facility with secured access in and around the proposed antenna. Since the proposed earth station will not transmit at an antenna elevation of less than 13.7 degrees, and since one diameter removed from the center of main beam the levels are down at least 20 dB, or by a factor of 100, public safety will be ensured for the near and far field regions.

Finally, occupational exposure will be limited, and the transmitter will be turned off during periods of maintenance, so that the MPE standard of 5.0 mw/cm**2 will be complied with for those regions in close proximity to the main reflector, and subreflector, which could be occupied by operating personnel.