Radiation Hazard Analysis

Operator:	SES				
Location Designation:	Sunset Beach ES	5	FCC Callsign:	E090060	
County:	Honolulu		SES ID:	C2	
Town:	Haleiwa		STA:		
State/Zip:	Hawaii	96712			
Input Values	Value	Unit		Band	Frequency
D = Aperture Diameter	9.00	Meters		L	1000-2000
d = Subreflector Diameter	0.94	Meters		S	2000-4000
G = Antenna Gain	53.4	dBi		С	4000-8000
FCC Designation	С	Band		X	8000-12500
F = Frequency	6.005	GHz		Ки	12500-18000
P = Transmitter Power Watts:	1445	Watts		K	18000-25500
$R_{ua} = closest point to uncontrolled area$	50	meters		Ka	26500-40000
Elevation angle at closest point R_{ua}	10	Degrees		0	40000-50000
Height (AGL)	8.68	meters		V	50000-75000
		-			
OET 65 Calculated Values	Formula	Value	Unit		
OET 65 Calculated Values $\lambda = Wavelength$	Formula C F	Value 0.0499	Unit meters		
OET 65 Calculated Values λ= Wavelength G = Antenna Gain	<i>Formula</i> <i>C</i> <i>F</i> 10 ^(G/10)	Value 0.0499 218776.1624	Unit meters (W) linear	-	
OET 65 Calculated Values $\lambda =$ Wavelength $G =$ Antenna Gain $\eta =$ Apperture Efficiency	$ Formula \frac{c}{F} 10^{(G/10)} \underline{G\lambda^2/4\pi} \pi D^2/4 $	Value 0.0499 218776.1624 68%	Unit meters (W) linear percentage	-	
OET 65 Calculated Values λ = Wavelength G = Antenna Gain η = Apperture Efficiency A = Area of reflector	Formula $ $	Value 0.0499 218776.1624 68% 63.617	Unit meters (W) linear percentage meters ²		
OET 65 Calculated Values λ = Wavelength G = Antenna Gain η = Apperture Efficiency A = Area of reflector a = area of subreflector	$Formula$ $\frac{c}{F}$ $10^{(G/10)}$ $\frac{G\lambda^2/4\pi}{\pi D^2/4}$ πR^2 πr^2	Value 0.0499 218776.1624 68% 63.617 6939.778	Unit meters (W) linear percentage meters ² cm ²		
OET 65 Calculated Values λ = Wavelength G = Antenna Gain η = Apperture Efficiency A = Area of reflector a = area of subreflector R_{-1} = Near-Field Region	$Formula$ $\frac{c}{F}$ $10^{(G/10)}$ $\frac{G\lambda^2/4\pi}{\pi D^2/4}$ πR^2 πr^2 D^2	Value 0.0499 218776.1624 68% 63.617 6939.778 405.608	Unit meters (W) linear percentage meters ² cm ² meters		
OET 65 Calculated Values λ = Wavelength G = Antenna Gain η = Apperture Efficiency A = Area of reflector a = area of subreflector R_{nf} = Near-Field Region	$Formula$ $\frac{c}{F}$ $10^{(G/10)}$ $\frac{G\lambda^2/4\pi}{\pi D^2/4}$ πR^2 πr^2 $\frac{D^2}{4\lambda}$	Value 0.0499 218776.1624 68% 63.617 6939.778 405.608 70	Unit meters (W) linear percentage meters ² cm ² meters Meters AGL		
OET 65 Calculated Values $\lambda =$ Wavelength $G =$ Antenna Gain $\eta =$ Apperture Efficiency $A =$ Area of reflector $a =$ area of subreflector $R_{nf} =$ Near-Field Region $R_{nf} =$ Transition Region	$\begin{tabular}{c} \hline Formula \\ \hline C \\ F \\ \hline 10 \ ^{(G/10)} \\ \hline 0 \ ^{(G/10)} \\ \hline 0 \ ^{(G/2)} \\ \hline 0 \ ^{(G/10)} \\ \hline 0 \$	Value 0.0499 218776.1624 68% 63.617 6939.778 405.608 70 405.608	Unitmeters(W) linearpercentagemeters2cm2metersMeters AGL>meters		
OET 65 Calculated Values $\lambda = Wavelength$ $G = Antenna Gain$ $\eta = Apperture Efficiency$ $A = Area of reflector$ $a = area of subreflector$ $R_{nf} = Near-Field Region$ $R_t = Transition Region$	$\begin{tabular}{c} \hline Formula \\ \hline C \\ F \\ \hline 10 \ ^{(G/10)} \\ \hline \hline \Omega \lambda^2/4\pi \\ \pi D^2/4 \\ \hline \pi R^2 \\ \hline \pi r^2 \\ \hline D^2 \\ 4\lambda \\ \hline R_{nf} \\ < R_{ff} \\ \hline \end{tabular}$	Value 0.0499 218776.1624 68% 63.617 6939.778 405.608 70 405.608 973.459	Unitmeters(W) linearpercentagemeters2cm2metersMeters AGL>meters <meters< td=""><meters< td=""><meters< td=""></meters<></meters<></meters<>		
OET 65 Calculated Values $\lambda = Wavelength$ $G = Antenna Gain$ $\eta = Apperture Efficiency$ $A = Area of reflector$ $a = area of subreflector$ $R_{nf} = Near-Field Region$ $R_{i} = Transition Region$ $R_{i} = Far Field Region$	$\begin{tabular}{c} \hline Formula \\ \hline C \\ \hline F \\ \hline 10 \ ^{(G/10)} \\ \hline \hline \Omega \lambda^2/4\pi \\ \pi D^2/4 \\ \hline \pi R^2 \\ \hline \pi r^2 \\ \hline D^2 \\ \hline 4\lambda \\ \hline R_{nf} \\ \hline R_{ff} \\ \hline 0.6D^2 \\ \hline \end{tabular}$	Value 0.0499 218776.1624 68% 63.617 6939.778 405.608 70 405.608 973.459 973.459	Unitmeters(W) linearpercentagemeters2cm2metersMeters AGL>meters <meters< td=""><meters< td="">metersmetersmetersmetersmetersmeters</meters<></meters<>		

					Exposure Limits	
Radiation Analysis Zone		Formula	Level	Value	General Public	Occupational
					<1mW/cm2	<5mW/cm2
1	Power Subreflector	<u>4P</u>	832.880	mW/cm2	>FCC MPE See	>FCC MPE See
		а			Note 1	Note 2
2	Antenna Surface	<u>4P</u>	9.086	mW/cm2	>FCC MPE See	>FCC MPE See
		Α			Note 1	Note 2
3	Main Reflector Ground	<u>P</u>	2.271	mW/cm2	>FCC MPE See	< ECC MDE
		Α			Note 1	<ree mpl<="" td=""></ree>
4	S_{nf} =Near-Field Power Density	<u>4η P</u>	6 107	mW/cm2	>FCC MPE See	>FCC MPE See
		Α	0.197		Note 1	Note 2
5	$S_t = Max$ Transition Power Density	$\leq S_{nf}$	6.197	mW/cm2	>FCC MPE See	>FCC MPE See
					Note 1	Note 2
6	$S_{ff} = Max Far field Power Density$	PG	2.655	mW/cm2	>FCC MPE See	
		$4\pi R_{\rm ff}^2$			Note 3	<fcc mpe<="" td=""></fcc>
7	Off Access Level Near Field	S _{nf} - 20 dB	0.06197	mW/cm2	<fcc mpe<="" td=""><td><fcc mpe<="" td=""></fcc></td></fcc>	<fcc mpe<="" td=""></fcc>

Notes

1. The antenna is installed in a controlled location access is restricted to authorized personnel only. The antenna is marked with RF Radiation Hazard signage.

2. Inside the controlled area, MPE levels exceed the MPE exposure for occupational levels. The levels will be reduced to safe MPE by removing power to the transmitters when work is performed on or around the antenna. This area can only be accessed by qualified personnel.

3. The field develops 8.68 meters above ground level at the minimum elevation angle which is not accessable to the general public.