Exhibit D-1
HUGHES NETWORK SYSTEMS
E060382 and E060383
Request for Modification

RADIATION CALCULATIONS FOR		9.20	meter EARTH STATION
Nomenclature	**Formula**	**Value**	**Unit**
INPUT PARAMETERS			
M = Antenna Aperture Major Axis		9.20	meters
m = Antenna Aperture Minor Axis		9.20	meters
d = Diameter of Feed Mouth		0.102	meters
f = frequency		30	GHz
P = Max Power into Antenna		220.0	Watts
n = Aperture Effeciency		51%	
k = Wavelength @ 30.00 GHz		0.0100	meters
CALCULATED VALUES			
A = Area of Reflector	PIxMxm/4	66.476	meters^2
l = Length of Near Field	M^2/4k	2117	meters
L = Beginning of Far Field	0.6M^2/k	5082	meters
G = Antenna Gain @ 30.00 GHz	n(4xPIxA)/k^2	4,266,254	(66.3) dBi
a = Area of Feed Mouth	PI*d^2/4	0.0082	meters^2

POWER DENSITY CALCULATIONS

Region	Maximum Power Density in Region		Hazard Assessment (FCC MPE Limit = 1 mW/cm^2)
	Formula	Value (mW/cm^2	
1 Near Field	4nP/A	0.71	< FCC MPE Limit
2 Far Field	GP/(4(PI)L^2)	0.30	< FCC MPE Limit
3 Transition	<= Nr Fld Region	0.71	< FCC MPE Limit
4 Near Reflector Surface	4P/A	1.38	> FCC MPE Limit (See Exhibit A)
5 Between Reflector & Ground	P/A	0.35	< FCC MPE Limit
6 Between Subreflector and Feed	4P/a	11258.9	> FCC MPE Limit (See Exhibit A)

Exhibit D-2
Hughes Network Systems
Call Sign E060382
Request for Modification

RADIATION CALCULATIONS FOR		1.80	meter EARTH STATION
Nomenclature	**Formula**	**Value**	**Unit**
INPUT PARAMETERS			
M = Antenna Aperture Major Axis		1.80	meters
m = Antenna Aperture Minor Axis		1.80	meters
d = Diameter of Feed Mouth		0.133	meters
f = frequency		30	GHz
P = Max Power into Antenna		11.3	Watts
n = Aperture Effeciency		54%	
k = Wavelength @ 30.00 GHz		0.0100	meters
CALCULATED VALUES			
A = Area of Reflector	PIxMxm/4	2.545	meters^2
l = Length of Near Field	M^2/4k	81	meters
L = Beginning of Far Field	0.6M^2/k	195	meters
G = Antenna Gain @ 30.00 GHz	n(4xPIxA)/k^2	172,918	(52.4) dBi
a = Area of Feed Mouth	PI*d^2/4	0.0139	meters^2

POWER DENSITY CALCULATIONS

Region	Maximum Power Density in Region		Hazard Assessment
	Formula	Value (mW/cm^2	(FCC MPE Limit = 1 mW/cm^2)
1 Near Field	4nP/A	0.93	< FCC MPE Limit
2 Far Field	GP/(4(PI)L^2)	0.40	< FCC MPE Limit
3 Transition	<= Nr Fld Region	0.93	< FCC MPE Limit
4 Near Reflector Surface	4P/A	1.73	> FCC MPE Limit (See Exhibit A)
5 Between Reflector & Ground	P/A	0.43	< FCC MPE Limit
6 Between Reflector and Feed	4P/a	316.7	> FCC MPE Limit (See Exhibit A)