EXHIBIT A1 - ANALYSIS OF NON-IONIZING RADIATION, 1.8 m Ku

HARMFUL LEVELS OF RADIATION WILL NOT EXIST IN REGIONS NORMALLY OCCUPIED BY PERSONNEL.

CRITERIA: ANSI SPECIFICATIONS REQUIRE THAT PERSONNEL NOT BE EXPOSED TO LEVELS OF NON-IONIZING RADIATION EXCEEDING 5 mW / cm^2.

THE FOLLOWING ANALYSES SUPPORT THIS DETERMINATION:

FAR FIELD ANALYSIS:

ANTENNA DIAMETER = 1.8 Meters
ANTENNA GAIN = 47.0 dBi (lin 50,119)
LAMBDA = $3*10^8$ Meters / $14.25*10^9$ Hz = 0.0210526
EFFICIENCY = $\eta = G/(\pi*D/\lambda)^2$ = 0.708
POWER MAX AT FLANGE = 500 Watts (27.0 dBW)
DISTANCE TO FAR FIELD = $2*D^2/\lambda$
= 6.48 / 0.0210526
= 307.8 Meters
ON-AXIS POWER DENSITY = G*P/4*π*Far Field Distance^2
= 50,119 * 500 / 12.56637 * 94,741
= 21.05 W/m^2
= 2.11 mW/cm^2
LEVEL IS LESS THAN THE 5 mW/cm^2 MAXIMUM ANSI LEVEL PERMITTED

NEAR FIELD ANALYSIS (Parallel Beam Region & Transition Region):

PARALLEL BEAM REGION ANALYSIS:
DISTANCE TO END OF PARALLEL BEAM (CYLINDER) REGION:
= DIAMETER^2 / 2.5 * λ
= 3.24 / 0.0526315
= 61.6 Meters
POWER DENSITY AT END OF PARALLEL BEAM REGION
= P / CYLINDRICAL PARALLEL BEAM AREA
= 500 / 3.24
= 154.32 W / m^2
= 15.4 mW / cm^2
LEVEL IS GREATER THAN THE 5 mW/m2 MAXIMUM ANSI LEVEL PERMITTED ANTENNA IS MOUNTED 10' IN THE AIR ON TRUCK, NO PERSONNEL WILL OCCUPY THE PARALLEL BEAM REGION DURING OPERATION.

TRANSITION REGION ANALYSIS:
THIS REGION WILL DECREASE INVERSELY WITH DISTANCE BEGINNING AT THE END OF THE PARALLEL BEAM REGION AND NOT EXCEED 15.4 mW / cm^2

Exhibit A1-pg2

MAIN REFLECTOR ANALYSIS:

= P / REFLECTOR AREA
= 500 / 3.24
= 154.32 W / m^2
= 15.4 mW/cm^2

LEVEL IS GREATER THAN THE 5 mW/m2 MAXIMUM ANSI LEVEL PERMITTED ANTENNA IS MOUNTED 10' IN THE AIR ON TRUCK, NO PERSONNEL WILL OCCUPY THE MAIN REFLECTOR OR THE FEED TO REFLECTOR REGION DURING OPERATION.

RF POWER WILL BE TURNED OFF DURING ANY ANTENNA MAINTENANCE REQUIRING PERSONNEL TO OCCUPY ANY HAZARDOUS REGION BETWEEN THE FEED HORN, REFLECTOR, AND TRANSITION ZONE.

AS A TRANSPORTABLE UNIT, PRECAUTIONS WILL BE TAKEN TO VERIFY THAT THE ANTENNA IS NOT POINTING TOWARD ANY POPULATED AREA.

PREPARED AND SUBMITTED BY:

BASIL F. PINZONE, JR. 07/26/2011
TECHNICAL CONSULTANT

EXHIBIT A2 - ANALYSIS OF NON-IONIZING RADIATION, 2.4 m C-Band

HARMFUL LEVELS OF RADIATION WILL NOT EXIST IN REGIONS NORMALLY OCCUPIED BY PERSONNEL.

CRITERIA: ANSI SPECIFICATIONS REQUIRE THAT PERSONNEL NOT BE EXPOSED TO LEVELS OF NON-IONIZING RADIATION EXCEEDING 5 mW / cm2.

THE FOLLOWING ANALYSES SUPPORT THIS DETERMINATION:

FAR FIELD ANALYSIS:

ANTENNA DIAMETER = 2.4 Meters
ANTENNA GAIN = 41.8 dBi (lin 15,135)
LAMBDA = $3*10^8$ Meters / $6.175*10^9$ Hz = 0.048583
EFFICIENCY = $\eta = G/(\pi*D/\lambda)^2 = 0.628$
POWER MAX AT FLANGE = 358 Watts (25.54 dBW)
DISTANCE TO FAR FIELD = $2*D^2/\lambda$
= 11.52 / 0.048583
=237.1 Meters
ON-AXIS POWER DENSITY = G*P/4*π*Far Field Distance^2
= 15,135 * 358 / 12.56637 * 56,216
= 7.67 W/m^2
= 0.77 mW/cm^2
LEVEL IS LESS THAN THE 5 mW/cm^2 MAXIMUM ANSI LEVEL PERMITTED

NEAR FIELD ANALYSIS (Parallel Beam Region & Transition Region):

PARALLEL BEAM REGION ANALYSIS:
DISTANCE TO END OF PARALLEL BEAM (CYLINDER) REGION:
= DIAMETER^2 / 2.5 * λ
= 5.76 / 0.12146
= 47.42 Meters
POWER DENSITY AT END OF PARALLEL BEAM REGION
= P / CYLINDRICAL PARALLEL BEAM AREA
= 358 / 5.76
= 62.15 W / m^2
= 6.22 mW / cm^2
LEVEL IS GREATER THAN THE 5 mW/cm^2 MAXIMUM ANSI LEVEL PERMITTED. ANTENNA IS MOUNTED 8' IN THE AIR. NO PERSONNEL WILL OCCUPY THE PARALLEL BEAM REGION DURING OPERATION.

TRANSITION REGION ANALYSIS:
THIS REGION WILL DECREASE INVERSELY WITH DISTANCE BEGINNING AT THE END OF THE PARALLEL BEAM REGION AND WILL NOT EXCEED 6.22 mW / cm^2

Exhibit A2-pg2

MAIN REFLECTOR ANALYSIS:

= P / REFLECTOR AREA
= 358 / 5.76
= 62.15 W / m^2
= 6.22 mW/cm^2

LEVEL IS GREATER THAN THE 5 mW/m2 MAXIMUM ANSI LEVEL PERMITTED. ANTENNA IS MOUNTED 8' IN THE AIR. NO PERSONNEL WILL OCCUPY THE MAIN REFLECTOR OR THE FEED TO REFLECTOR REGION DURING OPERATION.

RF POWER WILL BE TURNED OFF DURING ANY ANTENNA MAINTENANCE REQUIRING PERSONNEL TO OCCUPY ANY HAZARDOUS REGION BETWEEN THE FEED HORN, SUB-REFLECTOR, REFLECTOR, AND TRANSITION ZONE.

AS A TRANSPORTABLE UNIT, PRECAUTIONS WILL BE TAKEN TO VERIFY THAT THE ANTENNA IS NOT POINTING TOWARD ANY POPULATED AREA.

PREPARED AND SUBMITTED BY:

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