

EXHIBIT A - ANALYSIS OF NON-IONIZING RADIATION, 4.8 Meter

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	= 4.8 Meters
ANTENNA GAIN	= 48.1 dBi (lin 64,565)
LAMBDA	= 3×10^8 Meters / 6.175×10^9 Hz = 0.048583
EFFICIENCY	= $\eta = G / (\pi \cdot D / \lambda)^2 = 0.67$
POWER MAX AT FLANGE	= 450 Watts (26.5 dBW)
DISTANCE TO FAR FIELD	= $2 \cdot D^2 / \lambda$ = 46.08 / 0.048583 = 948.5 Meters
ON-AXIS POWER DENSITY	= $G \cdot P / 4 \cdot \pi \cdot \text{Far Field Distance}^2$ = $64,565 \cdot 450 / 12.56637 \cdot 758,792$ = 2.57 W/m ² = 0.257 mW/cm ²

LEVEL IS LESS THAN THE 5 mW/cm² MAXIMUM ANSI LEVEL PERMITTED

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

PARALLEL BEAM REGION ANALYSIS:

DISTANCE TO END OF PARALLEL BEAM (CYLINDER) REGION:	= $\text{DIAMETER}^2 / 2.5 \cdot \lambda$ = 23.04 / 0.12146 = 189.7 Meters
POWER DENSITY AT END OF PARALLEL BEAM REGION	= P / CYLINDRICAL PARALLEL BEAM AREA = 450 / 18.1 = 24.86 W / m ² = 2.49 mW / cm ²

LEVEL IS LESS THAN THE 5 mW/m² MAXIMUM ANSI LEVEL PERMITTED
NO PERSONNEL WILL OCCUPY THE PARALLEL BEAM REGION DURING OPERATION.

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TRANSITION REGION ANALYSIS:

THIS REGION WILL DECREASE INVERSELY WITH DISTANCE BEGINNING AT THE END OF THE PARALLEL BEAM REGION AND WILL NOT EXCEED $2.49 \text{ mW} / \text{cm}^2$

MAIN REFLECTOR ANALYSIS:

$$\begin{aligned} &= P / \text{REFLECTOR AREA} \\ &= 450 / 18.1 \\ &= 24.8 \text{ W} / \text{m}^2 \\ &= 2.48 \text{ mW/cm}^2 \end{aligned}$$

LEVEL IS LESS THAN THE 5 mW/m^2 MAXIMUM ANSI LEVEL PERMITTED.

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 AND REFLECTOR.

PRECAUTIONS WILL BE TAKEN TO VERIFY THAT THE ANTENNA IS NOT POINTING TOWARD ANY POPULATED AREA.

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