

Sinclair Broadcast Group, Inc.  
 Application for a New Temporary Fixed Earth Station  
 File Number SES-LIC-20200727-00801  
 Supplement To Pending Application

Sinclair Broadcast Group, Inc. ("SBG") supplements its pending application to provide a copy of its Radiation Hazard exhibit. Additionally, SBG provides the following corrected or additional information.

The application had provided Receive frequencies in GHz. The corrected values are in MHz. The Emissions Designator is also corrected to specify a zero instead of letter "O".

E28. Antenna Id	E43/44. Frequency Bands(MHz)	E45. T/R Mode	E46. Antenna Polarization(H,V,L,R)	E47. Emission Designator	E48. Maximum EIRP per Carrier(dBW)	E49. Maximum ERIP Density per Carrier(dBW/4kHz)
1	11700 12200	R	Horizontal and Vertical	36M0G7W	0.0	0.0
E50. Modulation and Services Digital Video						
1	14000 14500	T	Horizontal and Vertical	36M0G7W	66.3	26.8

The Frequency Coordination data did not specify values for Receive frequencies. The corrected values are provided below.

**FREQUENCY COORDINATION**

E28. Antenna Id	E51. Satellite Orbit Type	E52/53. Frequency Limits(MHz)	E54/55. Range of Satellite Arc E/W Limit	E56. Earth Station Azimuth Angle Eastern Limit	E57. Antenna Elevation Angle Eastern Limit	E58. Earth Station Azimuth Angle Western Limit	E59. Antenna Elevation Angle Western Limit	E60. Maximum EIRP Density toward the Horizon(dBW/4kHz)
1	Geostationary	11700 12200	60.0/140.0	154.0	41.6	252.3	12.2	0.0
1	Geostationary	14000 14500	60.0/140.0	154.0	41.6	252.3	12.2	-14.7

## RADIATION HAZARD STUDY

### SITE: SBG Corporate Headquarters

SBG has evaluated the radio frequency environment in and around the proposed earth station and found it to be safe for continuous exposure of operating personnel and the general public.

Only the internal antenna structure, specifically the area between the feedhorn and the dish, shows a radio frequency environment that is considered excessive for continuous exposure of personnel. This area is sufficiently high above ground level that it cannot accidentally be entered without the aid of mechanical equipment.

The supporting calculations that are submitted as part of this study show that the proposed earth station is environmentally safe, not only based on the criteria published in the Occupational Safety and Health Act (OSHA), but also in the light of recent recommendations for stricter control of radio frequency radiation.

#### 1.0 Station Parameters

Antenna Diameter (D) = 1.2 M  
Operating Wavelength ( $\lambda$ ) = .021 M  
Antenna Gain (G) = 43.3 dBi  
Transmitter RF Power (P) = 200.0 W

#### 2.0 Summary of Results

RF Power Density - Centerline of Near Field = 42.4 mw/cm<sup>2</sup>

RF Power Density - Far Field = 20.2 mw/cm<sup>2</sup>

\*RF Power Density - Edge of Near Field = 0.424 mw/cm<sup>2</sup>

\*RF Power Density - Behind Antenna = 0.04 mw/cm<sup>2</sup>

\* The density levels denoted by an asterisk are representative of the maximum radiation environment in or around the proposed earth station to which the general public may be exposed.

### 3.0 Near Field Evaluation

The earth station antenna that will be employed for this service is designed to focus nearly all of the radiated radio frequency energy into a cylindrical beam with a diameter only slightly larger than that of the antenna dish. Any intrusion into this beam would impair the performance of this earth station. This broadcaster has, therefore, selected a site location for the antenna that will insure that the beam of principle radio frequency radiation is clear of any obstructions, buildings, etc. and cannot accidentally be entered by the general public.

- 3.1 The near field cylindrical projection extends to a distance (d) that is defined by the following relationship:

$$d(\text{nf}) = D^2/4\lambda$$

$$d(\text{ff}) = .6D^2/\lambda$$

For the proposed antenna, the near field extends, therefore, to a distance of:

17.1 meters

And the far field extends, therefore, to a distance of:

41.1 meters

- 3.2 The maximum radio frequency power density within this near field cylinder is a function of the antenna diameter and transmitter power as follows:

$$W(\text{nf}) = 9.6P/\pi D^2$$

For the proposed earth station, the maximum power density in the near field was computed not to exceed:

42.44 mw/cm<sup>2</sup>

- 3.3 At the edge of the near field cylindrical beam, 0.7 antenna diameter removed from its center, the power density is attenuated at least 20 dB to 1/100th of the maximum near field power. The power along the outside edge of the beam will, therefore, not exceed:

0.424 mw/cm<sup>2</sup>

#### 4.0 Far Field Evaluation

Beyond the near field region, the cylindrical beam begins to spread gradually into a slightly tapered cone in accordance with the published radiation pattern for the proposed antenna. The specified antenna gain is realized and the radiated power density decreases proportionally to the inverse square of distance from the antenna.

- 4.1 For the purpose of determining the maximum power density within the far field, this broadcaster has conservatively assumed that the full antenna gain is already realized at the limit of the near field cylindrical region. The radio frequency power density in the far field region is given by:

$$W(\text{ff}) = PG/4\pi d^2$$

For the proposed earth station, the maximum radiated power at the point of transition between the near field and far field regions was computed not to exceed:

$$20.15 \text{ mw/cm}^2$$

#### 5.0 Off-Axis Evaluation

The proposed antenna meets or exceeds the performance specifications under part #25 of the FCC rules. The off-axis gain of this antenna is, therefore, - 10dBi or less in any direction more than 48° removed from the centerline of the main beam.

- 5.1 The off-axis power density may be conservatively evaluated using the far field method of computation:

$$W(\text{OA}) = 0.1P/4\pi d^2$$

Assuming a distance of 2 meters from the antenna, the density was calculated to be:

$$0.04 \text{ mw/cm}^2$$

## 6.0 Summary

- 6.1 The computed values for near field projection distance, RF power density at the centerline, RF power density in the far field, RF power density at the edge of the near field, and RF power density behind the antenna are furnished by the Engineering Department.
- 6.2 Radiation calculations verify that the actual levels, which are accessible to the general given the system design, do not exceed the OSHA maximum of  $5\text{mw}/\text{cm}^2$  with-in the off-axis access areas of the system.