O3b Limited dba SES Networks
Application for Experimental Special Temporary Authority

Annex A

I. Is a directional antenna (other than radar) used? Yes

i. Orientation in horizontal plane (degrees): Bristow, VA: 207.3° to 168.0°; Aberdeen, MD: 207.3° to 168.0°

ii. Orientation in vertical plane (degrees): Bristow, VA: 23.5° to 28.0°; Aberdeen, Maryland: 23.5° to 28.0°

iii. Operating between 28601MHz – 28838MHz

Carrier size: 5.55MHz or 4.7 Mega symbols per second (MSps)

Annex B: Isotropic compliance with EPFD uplink (↑) limits

Commented [GE1]: Will we need EPFD against Bristow (WMP) location and against Aberdeen (APG) location?

Commented [GE2]:

Commented [GE3R2]:

The following Figure 1 illustrates the Isotropic antenna pattern in azimuth and elevation with the GSO arc superimposed in az/el coordinates when the antenna boresight is pointing toward an O3b satellite located at 80°W (for example). The colormap shows the Isotropic antenna gain as a function of azimuth and elevation angles. The antenna gain data that intersects with the GSO arc is used to determine the gain in the direction of the GSO arc.

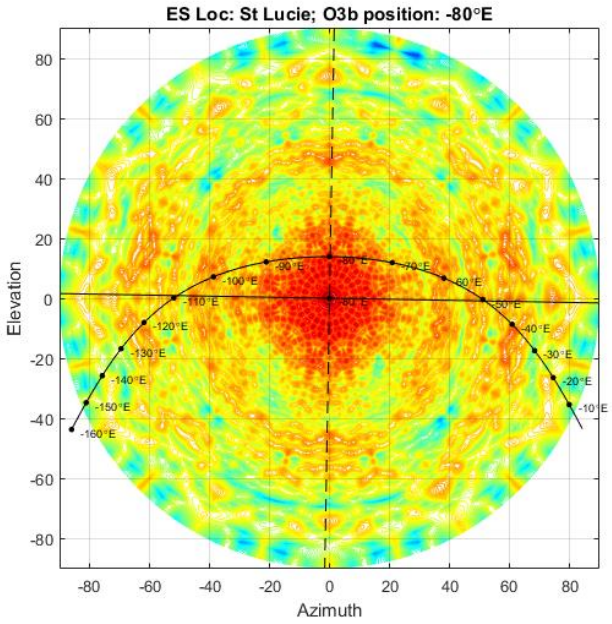

Figure 1 Port St. Lucie

The EPFD ↑ limit is −162 dBW/m2/40 kHz. The spreading loss determined by the equation

$$spreading\ loss\ (dB) = 10\log_{10}(4\pi d^2)$$

where d is the distance to a point on the GSO arc from the location on the Earth of the transmitting earth station. With the spreading loss, input power spectral density and antenna gain in the direction of the GSO arc, the EPFD↑ can be determined. The following graphic illustrates the EPFD↑ produced at the GSO arc from the Isotropic antenna.

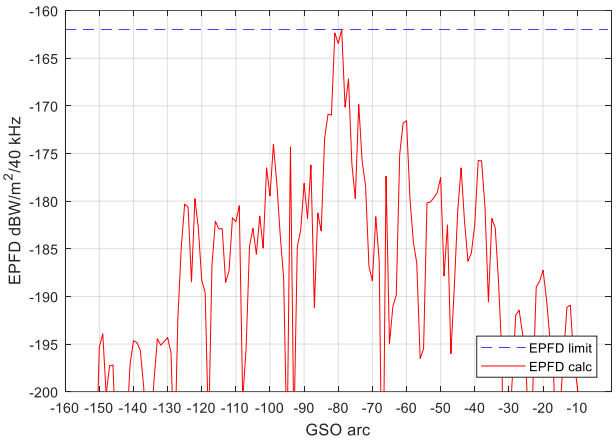

Figure 2 Port St. Lucie

As seen in Figure 2 above, the Isotropic antenna operations are compliant with the EPFD↑ limits in Article 22 of the ITU Radio Regulations.[1] This plot is for when the antenna boresight is pointing toward an O3b satellite located at 80°W (again, just an example). Since this is a moving antenna tracking an O3b satellite, the EPFD↑ limits are confirmed in the same way as demonstrated above for all pointing directions along the O3b orbit.

[1] 47 C.F.R. 25.289. If the applicable EPFD(up) limits are met, the NGSO FSS satellite system is considered to have met its obligations to protect GSO FSS networks from unacceptable interference.