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Vice President, Legal & Regulatory Affairs

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, DC 20554

FILED ELECTRONICALLY

3 March 2020

Subject: **SES-17 S.à r.l. Market Access Application for SES-17;**
File No. SAT-PPL-20190305-00014 (Call Sign S3043)

Dear Ms. Dortch,

SES-17 S.à r.l. ("SES"), pursuant to Section 1.65 of the Commission's rules, 47 C.F.R. §1.65, hereby supplements the technical information submitted in support of the above referenced application. Please find attached clarification of the plots submitted to demonstrate that operation of SES-17 in the 17.3-17.8 GHz band will comply with Section 25.264 of the Commission's rules, 47 C.F.R. §25.264.

Please address any questions regarding this additional information

Yours Sincerely,

/s/ Petra A. Vorwig
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ADDITIONAL TECHNICAL INFORMATION
IN SUPPORT OF SECTION 25.264 ANALYSIS

SES is providing below additional information to supplement the technical analysis it provided in File No. SAT-PPL-20190305-00014 (Call Sign S3043) ("SES-17 Application"). Specifically, Commission staff requested additional supporting material regarding the antenna cut plots and analysis used in the portion of the SES-17 Application demonstrating compliance with the requirements in §25.264. SES responds to the specific questions asked by staff below.

REQUEST ONE:
Describe the Reference Coordination System and how it meets Section 25.264(a)(1) and (2):

> **§25.264 Requirements to facilitate reverse-band operation in the 17.3-17.8 GHz band of 17/24 GHz BSS and DBS Service space stations.**
>
> *(a) Each 17/24 GHz BSS space station applicant or licensee must submit a series of tables or graphs containing predicted off-axis gain data for each antenna that will transmit in the 17.3-17.8 GHz frequency band, in accordance with the following specifications. Using a Cartesian coordinate system wherein the X axis is tangent to the geostationary orbital arc with the positive direction pointing east, i.e., in the direction of travel of the satellite; the Y axis is parallel to a line passing through the geographic north and south poles of the Earth, with the positive direction pointing south; and the Z axis passes through the satellite and the center of the Earth, with the positive direction pointing toward the Earth, the applicant or licensee must provide the predicted transmitting antenna off-axis antenna gain information:*
> *(1) In the X-Z plane, i.e., the plane of the geostationary orbit, over a range of ±30 degrees from the positive and negative X axes in increments of 5 degrees or less.*
> *(2) In planes rotated from the X-Z plane about the Z axis, over a range of ±60 degrees relative to the equatorial plane, in increments of 10 degrees or less.*

ANSWER:
SES included in Attachment A to the technical appendix of the SES-17 Application a set of 177 antenna off-axis gain plots showing each beam that will transmit in the 17.3-17.8 GHz frequency band, for angles of theta (θ) from -90 to +90 degrees and phi (ϕ) from -60 to + 60 degrees in steps of 10 degrees, as specified in the rule. SES included a figure in Annex C depicting the reference coordinate system for these plots.

Figures 1 and 2 below supplement the prior showing by providing the correlation of the angles theta (θ) and phi (ϕ) used in the antenna plots to the X, Y and Z axes described in §25.264(a)(1)&(2).

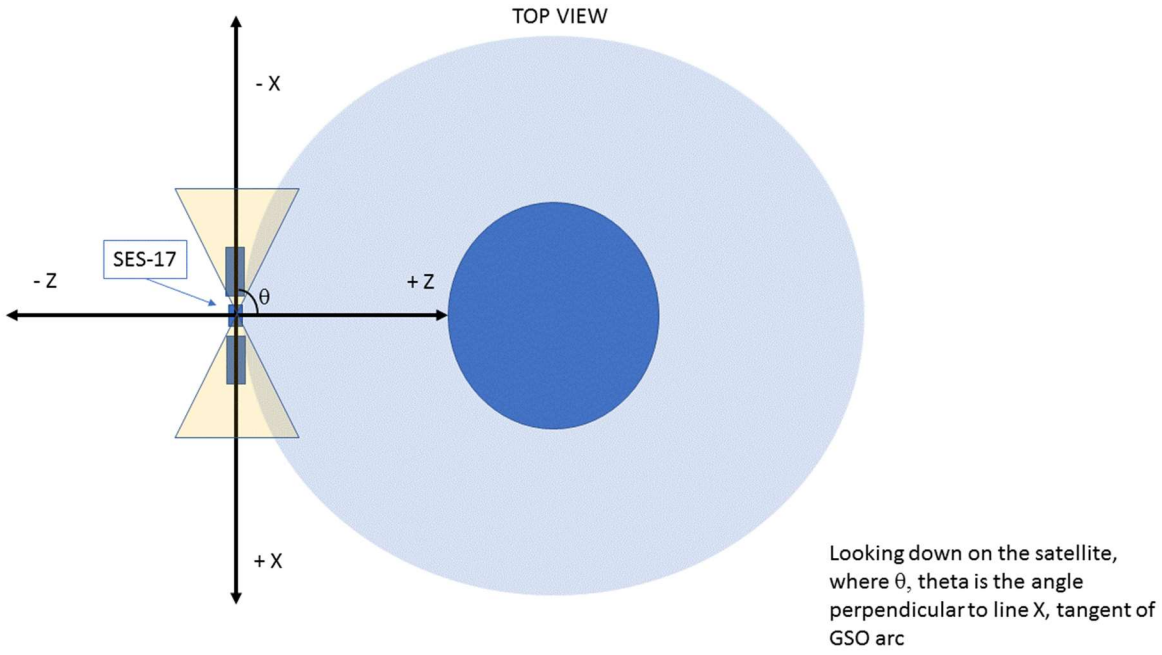

Figure 1

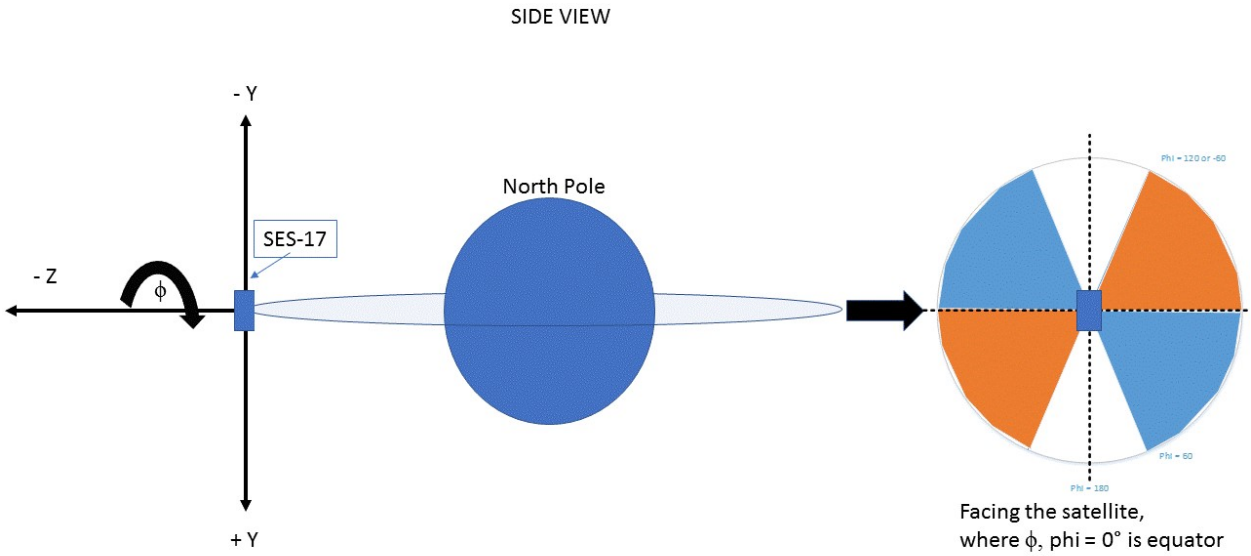

Figure 2

The analysis that was included in Table C.1 of the SES-17 Application used the highest off-axis gain value from all 177 plots in the respective +X and -X direction to the nearest DBS satellites. The margin in dB relative to the threshold of -117.0 dBW/m^2/100 kHz was 36 dB. In the same table, SES examined a hypothetical case with a DBS satellite 0.2 degrees away again using the highest off-axis gain. This case had a relative margin of 7.0 dB.

REQUEST TWO: Describe how the SES-17 showing complies with Section 25.264(a)(3) and (4):

(3) In both polarizations.

(4) At a minimum of three measurement frequencies determined with respect to the entire portion of the 17.3-17.8 GHz frequency band over which the space station is designed to transmit: 5 MHz above the lower edge of the band; at the band center frequency; and 5 MHz below the upper edge of the band.

In Table 1 below, SES indicates which polarizations and frequencies within the 17.3-17.8 GHz band were used to generate the 177 plots described above. As indicated in the table, not every beam on the satellite has dual polarization, and not all beams use the entire 17.3-17.8 GHz frequency band.

	Lowest Frequency	Polarization	17305 MHz			17550 MHz			17795 MHz			# of Plots	
			phi = 0	phi = 10-60 (+60)	phi = 120-170 (-60)	phi = 0	phi = 10-60 (+60)	phi = 120-170 (-60)	phi = 0	phi = 10-60 (+60)	phi = 120-170 (-60)		
	17300		R	R	R	R	R	R				6	
GW1	**17700**	L/R	NO OPERATIONS						B	B	B	6	
	17300												
GW2	17300	L/R	B	B	B	B	B	B	B	B	B	18	
	17300												
GW3	17300	L/R	B	B	B	B	B	B	B	B	B	18	
GW4	17300	L	L	L	L	L	L	L	L	L	L	9	
	17300		L	L	L	L	L	L				6	
GW5	**17700**	L/R	NO OPERATIONS						B	B	B	6	
	17300		R	R	R	R	R	R				6	
GW6	**17700**	L/R	NO OPERATIONS						B	B	B	6	
	17300												
GW7	17300	L/R	B	B	B	B	B	B	B	B	B	18	
GW8	17300	R	R	R	R	R	R	R	R	R	R	9	
	17300												
GW9	17300	L/R	B	B	B	B	B	B	B	B	B	18	
GW10	17300	L	L	L	L	L	L	L	L	L	L	9	
GW11	17300	R	R	R	R	R	R	R	R	R	R	9	
GW12	17300	R	R	R	R	R	R	R	R	R	R	9	
GW13	17300	R	R	R	R	R	R	R	R	R	R	9	
GW14	17300	L	L	L	L	L	L	L	L	L	L	9	
GW15	**17700**	R	NO OPERATIONS						R	R	R	3	
GW16	**17700**	L	NO OPERATIONS						L	L	L	3	
												177	TOTAL

L = Left Hand Circular Polarization, 1 plot
R = Right Hand Circular Polarization, 1 plot
B = Dual Polarization, 2 plots

Table 1 SES-17 17.3-17.8 GHz Polarization and Frequency Use