

**From:** [Kelsie Rutherford](#)  
**To:** [Jae Lim](#)  
**Cc:** [Kerry Murray](#); [Sylvia Lam](#); [Suzanne Malloy](#)  
**Subject:** [EXTERNAL]: Re: SES-LIC-20210217-00350; Call Sign: E210037  
**Date:** Wednesday, October 6, 2021 2:35:58 PM  
**Attachments:** [image.png](#)

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Dear Jae,

Please see below O3b's responses to your questions. Please let us know if you need any additional information or if you would like to have a call to further discuss.

Kind regards,

**Kelsie Rutherford**

Regulatory Counsel

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**Question 1:** Requests that O3b Provide an Interference Analysis with Respect to GSO Satellite Networks to demonstrate how the 5.5m CGC Type 5-X/Y antenna's proposed operation will meet the EPFD limits in Article 22 of the ITU Radio Regulations and submit related data.

Section 25.146 requires NGSO FSS applicants proposing operations in the 10.7-30 GHz frequency range to "certify" that they "will comply with . . . [a]ny applicable equivalent power flux-density levels in Article 22, Section II, and Resolution 76 of the ITU Radio Regulations."

Consistent with this rule, the application's narrative statement contains the following text: "Pursuant to Sections 25.115(f)(1) and 25.146(a)(2) of the Commission's rules, O3b hereby certifies that the earth station operations proposed herein will comply with the applicable equivalent power flux-density ("EPFD") levels in Article 22, Section II, and Resolution 76 of the ITU Radio Regulations. The Commission has recognized that any NGSO system that complies with these international EPFD limits "is considered as having fulfilled its obligation . . . not to cause unacceptable interference to any GSO network." The narrative goes on to make clear

that “O3b will not claim protection from interference from U.S.-licensed GSO FSS networks in the 27.5-28.6 GHz and 29.5-30 GHz bands.”

We believe the above language satisfies the Commission's requirements.

**Questions 2 & 3:** Requests that O3b provide uplink information that is specific to various sub-bands, including the 27.5-28.35 GHz, 29.1-29.25 GHz, 28.35-29.1 GHz, and 29.3-30 GHz frequency bands and make related changes to Form 312:

O3b provided the information for questions E43-E60 of the Schedule B for the full 27.5-30 GHz uplink frequency range, consistent with its practice in other earth station applications that the Commission has accepted for filing. *See, e.g.*, Call Sign E202133, File No. SES-LIC-20200721-00777. O3b is unaware of any Commission rule that requires that the uplink frequencies be subdivided into individual segments and is concerned that providing the technical data for the requested sub-bands risks introducing error.

**Question 4:** Request that O3b Provide an updated Radiation Hazard Analysis to demonstrate that the total MPE of all 5 antennas will meet the Section 1.1307(b) of the Commission’s rules for multiple carriers at site.

The Radiation Hazard Analysis filed with the application concludes that the MPE of a single gateway antenna exceeds the exposure limits set forth in Section 1.1307(b) and discusses the access restrictions and other measures O3b will take to mitigate radiation exposure consistent with Commission guidelines. An analysis of the combined effect of simultaneous operation of all five gateway antennas would not alter this conclusion or change the mitigation measures required to prevent exposure, which would be the same for five antennas as for just one gateway antenna. We note that when operational, the five antennas will not all be active at the same time nor point in the same direction.

As required under Section 1.1307, O3b will take mitigation measures, and its Analysis fulfils disclosure requirements set forth under Section 1.1307(b)(4) to ensure compliance with the Commission’s exposure limits.

**Question 5:** Request that O3b Provide a complete coordination letter (which includes the agreed EIRP, EIRP density, off-axis EIRP density) or provide an Interference Analyses to demonstrate that proposed operation in the 19.4-19.6 GHz and 29.1-29.3 GHz frequency bands will not cause unacceptable interference to IRIDIUM SATELLITE LLC’s 3m earth stations located at TEMPE, MARICOPA, AZ (33° 20' 32.0" N 111° 53' 56.0" W) (Call Sign: E960131) (Contact Ms. Maureen C McLaughlin Phone: 703-287-7518 E-Mail: [maureen.mclaughlin@iridium.com](mailto:maureen.mclaughlin@iridium.com)).

Pursuant to Sections 25.203(k) and 25.250 of the Commission's rules, 47 C.F.R. §§ 25.203(k) and 25.250, O3b and Iridium have completed frequency coordination between the Iridium system and the O3b Phoenix mPOWER gateway earth station, agreeing that the technical parameters specified in the coordination documents achieve compatibility between the two systems. Once Iridium returns a signed copy of the agreement, O3b will file an update letter confirming that coordination has been reached and that its proposed operations in the 29.1-29.3 GHz and 19.4-19.6 GHz bands will comply with the technical parameters included in the frequency coordination agreement. O3b will not exceed those discussed parameters without agreement from Iridium, regardless of whether the license authorizes higher maximum operating parameters.

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**From:** Jae Lim <Jae.Lim@fcc.gov>

**Sent:** Friday, August 27, 2021 1:04 PM

**To:** Kelsie Rutherford <Kelsie.Rutherford@ses.com>

**Cc:** Kerry Murray <Kerry.Murray@fcc.gov>; Sylvia Lam <Sylvia.Lam@fcc.gov>

**Subject:** SES-LIC-20210217-00350; Call Sign: E210037

Hi Kelsie,

We have reviewed your LIC application and we suggest that you submit an AMD for the following items.

Please verify information and let us know if you have any question.

Thanks.

Jae Lim  
FCC/IB

1. Please provide an Interference Analyses with Respect to GSO Satellite Networks to demonstrate how the 5.5m CGC Type 5-X/Y antenna's proposed operation will meet the EPFD limits in Article 22 of the ITU Radio Regulations. Please also provide the following uplink information in the 27.5-28.6 GHz and 29.5-30 GHz frequency bands:
  - a. a maximum input power spectral density (dBW/40kHz and dBW/4kHz) for earth station,
  - b. the minimum separation angle between the O3b orbit and the GSO arc (degrees),
  - c. the off-axis gain (dBi) (32-25log( $\theta$ ) transmitting from earth station),
  - d. the off-axis EIRP density towards the GSO (dBW/40kHz and dBW/4kHz),
  - e. the minimum elevation angle from earth station El Mirage, AZ to the GSO orbit/satellite,
  - f. the spreading loss

1. In items E28, E43/44, E45, E46, E47, E48, E49, and E50 of FCC Form 312, please amend to the following for the 27.5-28.35 GHz and 29.1-29.25 GHz frequency bands:

- a. 1-5    27500 28350    T            Left and Right Circular    54M0G7D    66.4    25.1
- b. 1-5    29100 29250    T            Left and Right Circular    54M0G7D    66.4  
          25.1
- c. 1-5    27500 28350    T            Left and Right Circular    850MG7D    78.4    25.1
- d. 1-5    29100 29250    T            Left and Right Circular    850MG7D    78.4  
          25.1

3. In items E51, E52/53, E54/55, E56, E57, E58, and E59 of FCC Form 312, please amend to the following for the 27.5-28.35 GHz and 29.1-29.25 GHz frequency bands:

|                       |             |          |        |     |
|-----------------------|-------------|----------|--------|-----|
| Non-Geostationary     | 27500 28350 | 0.0/ 0.0 | 103.73 | 5.0 |
| 256.19            5.0 | -23.39      |          |        |     |
| Non-Geostationary     | 29100 29250 | 0.0/ 0.0 | 103.73 | 5.0 |
| 256.19            5.0 | -23.39      |          |        |     |

1. For other frequency bands, in items E28, E43/44, E45, E46, E47, E48, E49, and E50 of FCC Form 312, please amend to the following:

- b. 1-5    28350- 29100 T            Left and Right Circular    54M0G7D    73.4    32.1
- f. 1-5    29300- 30000 T            Left and Right Circular    54M0G7D    73.4  
          32.1
- g. 1-5    28350- 29100 T            Left and Right Circular    850MG7D    85.4    32.1
- h. 1-5    29300- 30000 T            Left and Right Circular    850MG7D    85.4  
          32.1

5. For other frequency bands, in items E51, E52/53, E54/55, E56, E57, E58, and E59 of FCC Form 312, please amend to the following:

|                       |              |          |        |     |
|-----------------------|--------------|----------|--------|-----|
| Non-Geostationary     | 28350- 29100 | 0.0/ 0.0 | 103.73 | 5.0 |
| 256.19            5.0 | -16.39       |          |        |     |
| Non-Geostationary     | 29300- 30000 | 0.0/ 0.0 | 103.73 | 5.0 |
| 256.19            5.0 | -16.39       |          |        |     |

6. There are 5 CGC 5.5m antennas located at El Mirage, AZ. The input power at antenna flange for each antenna is 500 Watts (see attached Radiation Hazard Analysis in the application). Please provide an updated Radiation Hazard Analysis to demonstrate that the total MPE of all 5 antennas will meet the Section 1.1307(b) of the Commission's rules for multiple carriers at site.

Please provide a complete coordination letter (which includes the agreed EIRP, EIRP density, off-axis EIRP density) or provide an Interference Analyses to demonstrate that proposed operation in the 19.4-19.6 GHz and 29.1-29.3 GHz frequency bands will not cause unacceptable interference to IRIDIUM SATELLITE LLC's 3m earth stations located at TEMPE, MARICOPA, AZ (33° 20' 32.0" N 111° 53' 56.0" W) (Call Sign: E960131) (Contact Ms. Maureen C McLaughlin Phone: 703-287-7518 E-Mail: [maureen.mclaughlin@iridium.com](mailto:maureen.mclaughlin@iridium.com)).