

**From:** Merissa Velez

**Sent:** Tuesday, February 16, 2021 6:17 PM

**To:** Lin, Tony <[tony.lin@hoganlovells.com](mailto:tony.lin@hoganlovells.com)>; Luc Riesbeck <[l.riesbeck@astroscale-us.com](mailto:l.riesbeck@astroscale-us.com)>; Alexandra Gravereaux <[a.gravereaux@astroscale.com](mailto:a.gravereaux@astroscale.com)>; Kumar Singarajah <[k.singarajah@astroscale.com](mailto:k.singarajah@astroscale.com)>; [TOCC@usei-teleport.com](mailto:TOCC@usei-teleport.com); 'Hemple, Steven' <[Steven.Hemple@viasat.com](mailto:Steven.Hemple@viasat.com)>; 'May, Frances E.' <[fmay@cstars.miami.edu](mailto:fmay@cstars.miami.edu)>

**Cc:** Karl Kensinger <[Karl.Kensinger@fcc.gov](mailto:Karl.Kensinger@fcc.gov)>; Paul Blais <[Paul.Blais@fcc.gov](mailto:Paul.Blais@fcc.gov)>; Alexandra Horn <[Alexandra.Horn@fcc.gov](mailto:Alexandra.Horn@fcc.gov)>

**Subject:** Query for Astroscale re: ELSA-d Mission, IBFS File Nos. SES-STA-20200113-00043; SES-STA-20200117-00055; SES-STA-20200811-00859

Good afternoon:

In connection with FCC IBFS File Nos. SES-STA-20200113-00043, SES-STA-20200117-00055, and SES-STA-20200811-00859, please see some additional questions for Astroscale, the mission operator, below regarding the ELSA-d mission, based on the information that has been provided to the Commission to date.

1. Please review and provided updated information concerning the “ELSA-d CONOPS and Debris Mitigation Overview,” which appears to have been drafted in the first half of 2020 or earlier, to reflect any changes/additional information developed since this document was originally prepared.
2. The “ELSA-d CONOPS and Debris Mitigation Overview” document provided in the captioned application files indicates at page 3 that “The demonstration mission will occur in an orbit between 500 and 600 km altitude (with a nominally target orbit of 550 km), depending on the deployment altitude of the primary mission of the launch vehicle, and have a mission duration of 6 to 12 months.” As the launch and primary vehicle are now known, please provide a more precise description of targeted deployment orbital altitude. (We note that some sources show the planned altitude for the primary mission as 490 km, but with other secondary payloads shown at altitudes ranging up to 600 kilometers.)
3. Please provide an estimate of the number of collision avoidance messages expected for the ELSA-d mission involving third party spacecraft.
4. Please provide additional detail on the process for collision avoidance.
  - a. Astroscale states that it will share information with the European Space Agency related to the operations of the ELSA-d mission, as part of a contract for support of collision avoidance processes.
    - i. Please indicate whether this support will include planning for maneuvers during the mission demonstration phase.
    - ii. Please provide greater detail concerning the processes for sharing data, including planned trajectories, with third parties, including the expected interval at which updated information will be provided. In particular, given that the mission CONOPS during demonstration phases include several instances of either automatic or operator-initiated aborts, please include in this description the method or process for ensuring that third parties are apprised of possible trajectories resulting from anticipated abort modes.
    - iii. How frequently will TLEs be updated with ESA under the agreement? What procedures would be undertaken if ESA notifies Astroscale of a potential conjunction during the mission demonstration phases?

- b. Astroscale states that satellite laser ranging reflectors on the servicer and client will enable high-precision orbit determination and provide GPS measurements at least twice a day. Please indicate whether there are conditions (e.g., maneuver sequences, predicted conjunctions with third parties) under which more frequent observations will be undertaken, and, if so, how frequently can the information derived can be updated and disseminated to third parties? How will this information be integrated into the processes for collision avoidance and coordination with other operators in the same orbital altitudes?
5. Astroscale indicates it is in the process of conducting a full analysis for the client and servicer together as they de-orbit. Please provide the results of that analysis.

We also strongly urge that Astroscale, as the satellite operator, work to timely resolve the concerns that have been raised with respect to the request for confidential treatment of certain information provided by Astroscale to the Commission. Until such time as these concerns are addressed and resolved, there will be a non-trivial procedural impediment to Commission action on these applications. We specifically request that Astroscale review carefully whether confidential treatment of the materials it submitted is necessary and justified, and consider removing its request for confidential treatment if not. We would appreciate a specific response to this request by Thursday, February 18. In the event Astroscale determines that it wishes to maintain its request for confidential treatment of the information submitted, we will then address the requests for confidential treatment and for access through additional processes, potentially including a protective order or ruling on the request for confidential treatment. Thank you.

Best regards,

Merissa Velez

Chief, Satellite Policy Branch  
Satellite Division, International Bureau  
FCC