Answers to Questions from SB Oct 1, regarding SC1:

Taking into account the response about the NASA definition of what is considered a tether, we still need more information about this “tether-like or boom” attachment object that will be deployed with a cube attached at one end. This attachment does not appear to have been addressed in any detail in the debris mitigation plan, which appears to have focused on the spacecraft main body.

() Please state whether the attachment is flexible or rigid.
Answer: The cube is rigid, the attachment is flexible.

() What types of material(s) is the attachment made of?
Answer: The attachment is made out of polyester. The structure of the cube is PEEK, the screws are stainless steel, and the robotic markers are aluminum (10% of total mass).

() What is the precise length of this attachment?
Answer: 100 meters

() How was the spacecraft cross sectional area calculated? Did the calculation include all attachments?
Answer: The cross sectional area calculation included the 16U frame. Small extrusions for attachments like antennas, the propulsion thruster, and the deployable cube were not included. The deployed cube was not included in the area calculation.

() What is the probability of attachment colliding with large space objects (this appears not to have been included in the spacecraft large object collision risk assessment provided)? A potential method for completing this analysis would be to calculate large object collision risk for a sphere object that would encompass the fully deployed spacecraft (in other words, with a diameter equal to the longest dimension of the entire object).
Answer: The suggested potential method (a 100m sphere with the same area to mass ratio) was used in DAS. This yielded a large object collision risk of 0.042, which is not compliant with the limit of 0.001. However the approximation of a 100m sphere is extremely conservative, of course, because almost all of the collisions that would occur with a 100m sphere, would not occur with the spacecraft and connector. The actual risk is very much lower than this calculation indicates.

We request FCC provide guidance if an alternate approach is needed. We are prepared to reduce the length of the connector, or remove it altogether and make the 1U target a free flyer.
Note: the above answer was provided as part of the response to the Nov. 1 questions.

() With the attachment deployed, what measure of covariance do you expect the spacecraft to occupy? Additionally, please describe measures that will be taken to enhance location certainty for the spacecraft, if any.
Answer: When the issue of the cube, the connector and the collision risk is resolved we will try to answer any remaining questions about covariance.

() Is the attachment retractable? Will this attachment and cube be retracted into the spacecraft once the mission is completed?
Answer: The attachment is not retractable.

In the ODAR Appendix A: DAS Activity Log
There are some DAS activity log entries related to survival debris that your response indicates no longer apply to this application.

() Please review and remove any DAS activity log that has been superseded by a new DAS analysis and resubmit an updated Appendix A, e.g. below.

Page 56,
09 01 2024; 15:12:02PM *********Processing Requirement 4.7-1

Page 85,
06 17 2024; 16:30:39PM *********Processing Requirement 4.7-1
Answer: When the matter of the attached cube is resolved, the DAS will be rerun with the correct data, and the activity log will be updated in the ODAR, which will be submitted as an exhibit.

Radio Frequency Questions:
The spacecraft has a downlink operation in the 2264 MHz band. (This is not associated with the WiFi internal communications).

() Please provide a power-flux density showing in the 2264 MHz band demonstrating compliance with Article 21.16, Table 21-4 limit.
Answer: A calculation of power flux density showing compliance with Article 21.16, Table 21-4 limit has been submitted as an exhibit to the application.