



Federal Communications Commission
Washington, D.C. 20554

July 23, 2020

Mr. Philip Hover-Smoot
Momentum Inc.
3050 Kenneth St.
Santa Clara, CA 95054

Re: Momentum Inc.
IBFS File No: SAT-STA-20200609-00068

Dear Mr. Hover-Smoot:

On June 9, 2020, Momentum Inc. (Momentum) filed the above-captioned application for special temporary authority (STA) associated with operations of the Vigoride-1 (VR-1) non-geostationary orbit (NGSO) spacecraft. To aid the Commission's evaluation of the application, please provide the following additional information:

1. Momentum seeks waiver of section 25.113(g), which requires approval for orbital deployment and a station license before a space station may be deployed and operated in orbit. We ask that Momentum provide responses to Form 312 Main Form, Application for Satellite Space Station Authorizations, Questions 29-34 and 36-40.
2. Please clarify when during the mission the customer spacecraft will be deployed. The Narrative at p.4 states that the deployment will occur following orbital insertion, but the Narrative at p.5 and the ODAR state that the deployment will occur following orbit raising to (maximum) altitude of 570 km.
3. The Narrative states that the earth station operator Leaf Space may be planning to add additional ground stations in the U.S. Would these be utilized for communications with VR-1, if they become available?
4. Momentum has requested an STA for a period of 180 days. Will Momentum be communicating for the full 180 days using the requested frequency bands – and will any portion of this time be after the perigee has been lowered to 300 km altitude? In other words, will the period of spacecraft disposal that follows the lowering of the perigee to 300 km begin before the 180-day mark, and if so, will telemetry, tracking, and command communications continue for any portion of that period?
5. The ODAR at p.17 states that Momentum will ensure “real time collision avoidance and orbital maintenance maneuvers.” Will the VR-1 reserve fuel for conducting avoidance maneuvers during the planned orbit raising and subsequent lowering of the perigee to 300 km altitude? If so, what type of reserve would be expected to remain? Related to the question above, would the VR-1 retain fuel for conducting collision avoidance during the period of spacecraft disposal that follows lowering the perigee to 300 km, to the extent that communications with the spacecraft are maintained?
6. The ODAR shows inputs to the NASA Debris Assessment Software (DAS) of masses that do not match the values indicated earlier in the application. The DAS shows 174 kg (initial) and

145 kg (final) mass, while Table 2 on p. 8 shows 167.9 kg (total) to 161.8 kg (dry). Please address the discrepancies.

7. The ODAR casualty risk assessment indicates that there may be surviving debris but that the impact energy of any surviving piece of debris is less than 15 joules. This analysis uses an older version of DAS – v.2.1.1, and re-entry modeling has been updated for the DAS 3.0 software. Please provide analyses either using the newer version or, alternatively, provide the material compositions and initial masses of the objects expected to survive reentry.
8. Please clarify whether the casualty risk assessment in the application includes a scenario in which mass dummies would remain on board the spacecraft for atmospheric re-entry. If not, please provide a casualty risk analysis for a worst-case scenario where all customer spacecraft are replaced with mass dummies. This analysis would take into consideration the material expected to be used for the mass dummies.
9. The application states that Momentus is aware of the requirement to obtain a commercial remote sensing license. What is the current status of this application process?
10. Please indicate whether the electromagnetic emissions of the VR-1 thruster would exceed 15 uV/m at a distance of 300 meters.
11. The antenna gain contours provided do not show gains in 2 dB steps to 10 dB below max gain. Please provide antenna gain contours for transmit and receive antenna beams in accordance with the above.
12. The Schedule S provided does not include peak gain values for the transmit and receive beams.¹ Please provide this information.

To facilitate the Commission's timely evaluation of Momentus' application, we ask that you provide the requested information no later than **August 22, 2020**.

Sincerely,

/s/ Jose P. Albuquerque

Jose P. Albuquerque
Chief, Satellite Division
International Bureau

CC: Tony Lin
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¹ Schedule S at 6 and 8.