Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of	)	
	)	Call Sign: S3235
Intuitive Machines, LLC	)	
	)	File No. SAT-LOA-20250618-00149,
Application for Authority to Launch and Operate NOVA-C Lunar Lander	)	SAT-AMD-20260408-00161
	)	

APPLICATION AMENDMENT

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TABLE OF CONTENTS

EXHIBITS

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NARRATIVE

Intuitive Machines, LLC ("Intuitive Machines"), pursuant to Section 25.116 of the Commission's rules,[1] hereby submits this amendment ("Amendment") to its application for authority to launch and operate a NOVA-C Lunar Lander ("NOVA-C") as part of the Intuitive Machines 3 ("IM-3") mission.[2]

With this Amendment, Intuitive Machines: (1) updates the NOVA-C payload manifest and makes related requests for radiocommunications operations; (2) makes minor revisions to the NOVA-C's requested radiofrequency operations, as reflected in the Schedule S; and (3) provides additional orbital debris and space operations information in the accompanying Technical Appendix. Except for the specific changes identified in this Amendment, Intuitive Machines incorporates by reference all previously submitted information for the IM-3 mission.

I. INTRODUCTION

Intuitive Machines, founded in 2013, is a Texas-based innovator providing commercial lunar delivery, data transmission, and infrastructure services to open access to the Moon for the

[1] 47 C.F.R. § 25.116.
[2] *See* Intuitive Machines, LLC, ICFS File No. SAT-LOA-20250618-00149 (filed June 18, 2025) ("Initial Application").

progress of humanity. Selected by NASA as part of its Commercial Lunar Payload Services ("CLPS"), Intuitive Machines completed the first ever soft-landing of a commercial lunar lander in 2024 and continues to be a proud contributor to America's success in leading the Space Race 2.0. With this Amendment, Intuitive Machines seeks to amend the requested authority for the IM-3 mission sought in the Initial Application.

II. NOVA-C LAUNCH & PAYLOAD MANIFEST

The present anticipated launch date for NOVA-C is no earlier than Q4 of CY 2026. NOVA-C will launch aboard a SpaceX Falcon 9 and be placed into a direct transfer lunar orbit (*e.g.,* a "direct throw" to the Moon). The IM-3 mission phases, illustrated in Figure 1, remain consistent with information provided in the Initial Application.[3]

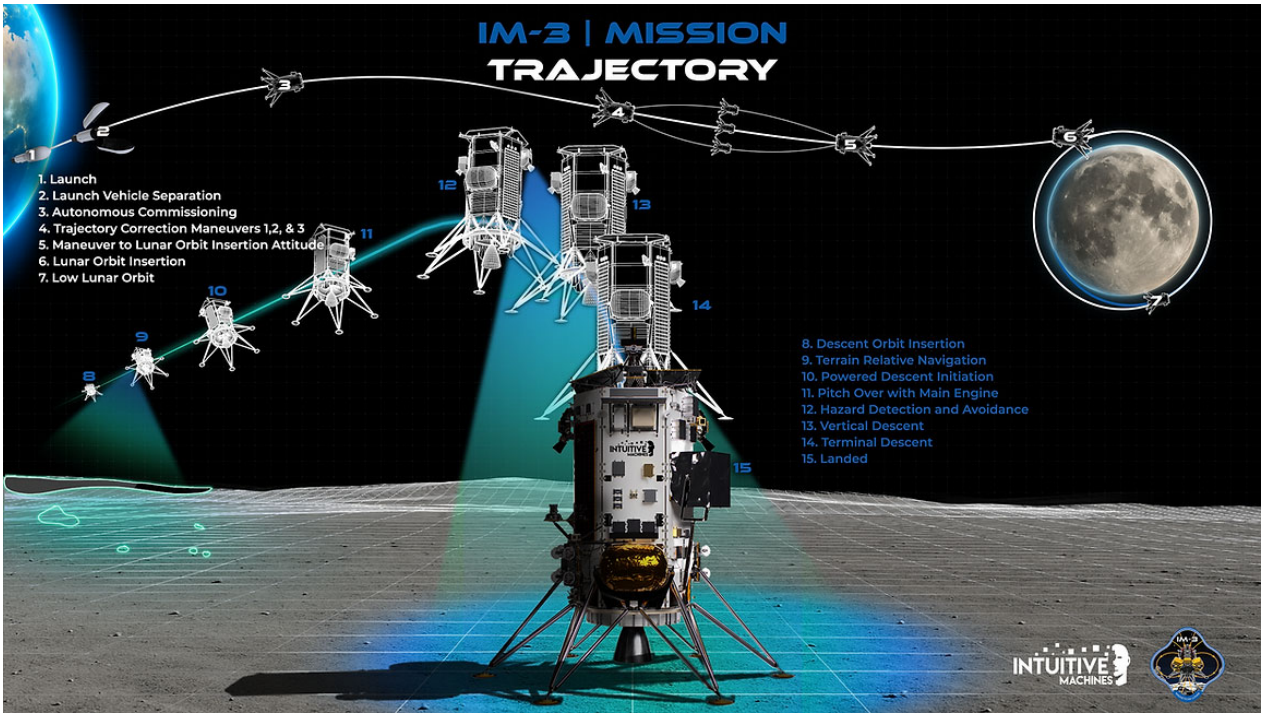

Figure 1. Illustration of IM-3 mission phases from launch to touch-down in the Reiner Gamma region of the Moon.

[3] Intuitive Machines provided further information on space safety by mission phase is provided its recently-filed supplemental responses. *See* Letter from Tim Bransford, Counsel to Intuitive Machines, to Ms. Marlene Dortch, FCC (Apr. 13, 2026). This includes further information on the expected orbit and trajectory of NOVA-C, efforts to coordinate with other operators, and maneuverability and trackability information.

The IM-3 mission will carry pioneering experiments and technologies to the lunar surface and expand capabilities for space exploration. **Two changes to the NOVA-C payload manifest occurred since filing of the Initial Application**: (1) the Cooperative Autonomous Distributed Robotic Exploration (CADRE) payload has been de-manifested, and (2) an EagleCAM-2 payload has been added.

This Amendment provides a complete payload manifest in Table 1, with the additional payload indicated in **blue text and bolded**. All payloads remain fixed to the instant NOVA-C lander (*e.g.,* do not deploy) and do not conduct radiocommunications unless otherwise noted.

Table 1. NOVA-C Payload Manifest.

Payload		Additional Information
LuSEM	Lunar Surface Environment Monitor	Hosted payload(s) integrated with the NOVA-C lander. Payload(s) will not deploy and will not conduct radiocommunications.
VCA	Vertex Camera Array	
VML	Vector Magnetometer-Lander	
MAPS	Magnetic Anomaly Plasa Spectrometer	
MoonLIGHT	Moon Laser Information for General Relativity/geophysics High-accuracy Tests	
VRCS	Virtual Reality Camera System	
ALEPH-1	Australian Lunar Experiment Promoting Horticulture	
PAO	Public Affairs Office Cameras	
LaRRI	Laser RetroReflector for Insight	
LVx Rover	Lunar Vertex Rover	Payload includes a rover to be deployed on the lunar surface, which will conduct space-to-space communications in S-band with NOVA-C.
SSTEF-1	Space Science & Technology Evaluation Facility – First Flight	Hosted payload consisting of multiple Technology Demonstration Experiments, including an encased 3-D Printed Antenna Evaluation test that will conduct localized Ku-band operations.
EagleCAM-2	EagleCam Deployer, Avionics Box, and EagleCam CubeSat	Payload includes a deployer integrated with NOVA-C and a CubeSat which will deploy during lunar descent; NOVA-C will conduct

Payload		Additional Information
		space-to-space communications with the EagleCam CubeSat in the 5 GHz.

A. Payloads With Radiofrequency Operations

Three of the IM-3 mission payloads will conduct active radiocommunications: (1) LVx Rover, (2) SSTEF-1, and (3) EagleCAM-2.

i. LVx Rover

The LVx Rover is a NASA CLPS science payload managed by the Johns Hopkins Applied Physics Laboratory.[4] The LVx payload includes a rover ("LVx Rover") that will deploy from NOVA-C after landing on the lunar surface. Consistent with the Initial Application, NOVA-C incorporates a dedicated S-band radio to conduct space-to-space radiocommunications with the deployed LVx Rover on an unprotected, non-interference basis.[5]

Intuitive Machines further clarifies that authority for LVx Rover radiocommunications is sought under the current application; the LVx Rover will not operate under a "companion" authorization. Intuitive Machines includes information on the LVx Rover primary and secondary antennas in the Technical Appendix, and confirms the operational characteristics are consistent with the beam information contained in the Schedule S.[6]

As discussed in the Initial Application, proposed operations of the LVx Rover will not harm or prejudice any third party, and good cause exists to permit short term, unprotected

[4] *See CP-11 Science*, NASA (July 9, 2025), https://science.nasa.gov/lunar-science/clps-deliveries/cp-11/; *Lunar Vertex*, JOHNS HOPKINS APPLIED PHYS. LAB. (2026), https://www.jhuapl.edu/destinations/missions/lunar-vertex.
[5] *See* Initial Application, Narrative at 7-8; *id.* Technical Appendix at 7. The Schedule S provided with this Amendment reflects the request for space-to-space links at 2411 MHz and 2472 MHz, consistent with the Initial Application.
[6] Beam information for space-to-space transmit and receive operations centered at 2472 MHz and 2411 MHz was provided with the Initial Application, and is re-created in the Schedule S accompanying this Amendment.

operations.[7] Intuitive Machines will serve as the responsible party for the LVx payload, and maintains "kill switch" authority for this payload, including for the LVx Rover.

ii. SSTEF-1

SSTEF-1 is a hosted payload aboard NOVA-C, developed by Aegis Aerospace with funding from a NASA Science & Technology Mission Directorate Tipping Point award.[8] This lunar test facility payload supports several technology demonstrations, including one that will conduct radiocommunications in the Ku-band. With this Amendment, **Intuitive Machines seeks authority for the Ku-band radiocommunications tests which will occur as part of the SSTEF-1 hosted payload** when NOVA-C is on the lunar surface.[9]

Relevant technical information for SSTEF-1 radiocommunications test is provided in the accompanying Technical Appendix and Schedule S. Operation of the SSTEF-1 represents no interference threat to any third party because the only incumbent service occupying the 14.5-14.8 GHz portion of the Ku-band proposed for experimentation is terrestrial mobile services pursuant to a primary allocation, and low-power SSTEF-1 radiocommunications on the lunar surface will be undetectable by terrestrial third parties. Radiocommunication tests will begin following NOVA-C landing on the lunar surface, and conclude with the onset of the lunar night. Additionally, Intuitive Machines will retain "kill switch" authority over SSTEF-1 radiocommunications. Grant of authority for SSTEF-1 radiocommunications is in the public interest because it will advance

[7] *See* Initial Application, Narrative at 22.
[8] SSTEF-1 will be Aegis Aerospace's second lunar test facility. *See* Christina Mire, *Aegis Aerospace Celebrates First Moon Bound Lunar Test Facility and Completion of Major Milestone for Second Facility*, AEGIS AEROSPACE (Feb. 20, 2025), https://aegisaero.com/news/aegis-aerospace-celebrates-first-moon-bound-lunar-test-facility-and-completion-of-major-milestone-for-second-facility/.
[9] This is a deviation from the Initial Application, which originally represented that Aegis Aerospace would apply for FCC authorization for use of these frequencies.

Aegis Aerospace and NASA tests involving new technology critical to longer duration manned and unmanned space operations.[10]

iii. EagleCAM-2

The EagleCAM-2 payload consists of a deployer integrated with NOVA-C and a CubeSat ("EagleCam CubeSat") which will be released just prior to lunar landing, approximately 30 meters above the lunar surface or 5 seconds before touch-down. The EagleCam CubeSat is a camera system, developed by Embry-Riddle Aeronautical University, which will capture the first-ever third-person view of a spacecraft extraterrestrial landing and uncover new scientific findings through dust plume imagery, dust accumulation analysis, and lunar surface imagery. With this Amendment, **Intuitive Machines seeks authority to conduct space-to-space communications between NOVA-C and the EagleCam CubeSat in the 5.15-5.25 GHz frequencies** on an unprotected, non-interference basis.

Technical information for the EagleCAM-2 radiocommunications is provided in the accompanying Technical Appendix and Schedule S. Intuitive Machines also includes a request to waive the Table of Frequency Allocations to permit space-to-space operations in the 5 GHz. The operations are low-power and present minimal risk of harmful interference, and the proposed use is consistent with U.S. advocacy before the ITU to add a space-to-space Space Research Service ("SRS") allocation in the 5150-5250 MHz for all regions.[11]

[10] *See, e.g.,* https://sam.gov/opp/5ecdaaa672024a76af4a096668b0298d/view#attachments-links *(NASA Tipping Point Award for the SSTEF-1).*
[11] *See* https://docs.fcc.gov/public/attachments/DA-26-182A1.pdf.

III. AMENDED RADIOFREQUENCY INFORMATION

With this Amendment, Intuitive Machines provides minimally-revised center frequencies for NOVA-C transmit/receive operations, incorporates additional requests for space-to-space radiocommunications authority, and conveys revised ground station information.

A. NOVA-C Earth-to-Space and Space-to-Earth Radiocommunications

Consistent with the Initial Application, NOVA-C will use S-band frequencies for Earth-to-space and space-to-Earth operations during all mission phases. Specifically, NOVA-C TT&C uplink operations will use a single frequency in the 2025-2110 MHz band, while TT&C and data downlink will use two frequencies in the 2200-2290 MHz.[12]

Intuitive Machines has marginally adjusted the NOVA-C uplink center frequency, and one of the two downlink center frequencies, as indicated in Table 2. These changes are reflected in the accompanying Schedule S.

Table 2. NOVA-C Amended Spectrum Usage.

Direction	Initial Application Center Frequency		Amended Request Center Frequency
Uplink (Earth-to-space)	2035.59416 MHz	➔	2035.594093 MHz
Downlink (space-to-Earth)	2210.6 MHz	➔	2210.59992 MHz
	2250 MHz	No change	2250 MHz

All other technical information remains consistent with the Initial Application, which Intuitive Machines incorporates by reference.

[12] *See* Initial Application, Technical Appendix at 3.

B. Space-to-Space Radiocommunications

NOVA-C will conduct space-to-space radiocommunications while in proximity to the lunar surface (*e.g.,* during descent) and on the lunar surface. Requested operations are summarized in Table 3, below, and incorporated in the accompanying Schedule S. Operations indicated in **blue text and bolded** are new requests not previously included in the Initial Application.

Table 3. NOVA-C Amended Space-to-Space Links.

Point of Communication	Center Frequency	Bandwidth	Directionality	Location
LVx Rover	**2411 MHz**	**4 MHz**	**Transmit & Receive**	**Lunar surface**
	2472 MHz	**4 MHz**		
SSTEF-1	**14.7 GHz**	**4 kHz**	**Transmit and Receive**	**Lunar surface**
EagleCAM-2 CubeSat	**5210 MHz**	**80 MHz**	**Transmit & Receive**	**Lunar orbit (altitude ≤ 30m) and Lunar surface**

C. Ground Segment

Intuitive Machines provides with this Amendment a revised ground station, as reflected in Table 4 and with changes indicated in **blue text and bolded.** All other information remains consistent with representations in the Initial Application.

Table 4. Revised IM-3 Mission Antenna Network.

Antenna	Ground Station	Location	Size (m)
Domestic			
DSS17	Morehead State University Space Sciences Center	Morehead, Kentucky	21
GS DSS-24	Deep Space Network	Goldstone, California	34
International			
PARKES	Parkes Observatory (receive only)	Parkes, Australia	64
GHY6	Goonhilly Satellite Earth Station	Helston, U.K	32
D32	Indian Deep Space Network	Byalalu, Karnataka, India	32
D18			18.3
SI1	Singapore	Singapore	9.1
MA1	Mauritius	Port Luis, Mauritius	7.3
DU1	Dubai	Dubai, UAE	7.3

KRU1	Kourou	Kourou, French Guiana	15
HBK1	Hartebeesthoek	Hartebeesthoek, South Africa	25.9
HBK2			12.2
CB DSS-34	Canberra DSN	Canberra, Australia	34
MD DSS-53	Madrid DSN	Madrid, Spain	34
USC34	**Uchinoura**	**Kimotsuki, Japan**	**34**

D. Spectrum Coordination

Intuitive Machines is coordinating with NASA and other Federal agencies to ensure NOVA-C operations will not interference with U.S. government operations and will operate in shared frequencies consistent with the outcomes of this coordination. Intuitive Machines has submitted updated IM-3 Mission spectrum data to NTIA in the standardized Non-federal Technical Data template, provided with the Amendment as Attachment 1.

IV. WAIVER REQUESTS

In addition to waivers requested in the Initial Application, Intuitive Machines respectfully requests waiver of the following rules under the special circumstances presented in this application.

The Commission may waive any of its rules if there is "good cause" to do so.[13] In general, waiver is appropriate if (i) special circumstances warrant a deviation from the general rule; and (ii) such deviation would better serve the public interest than would strict adherence to the rule.[14] Generally, the Commission will grant a waiver of its rules in a particular case if the relief requested would not undermine the policy objective of the rule in question and would otherwise serve the public interest.[15] Good cause exists to waive the following rules under the special circumstances presented in this application.

[13] *See* 47 C.F.R. § 1.3; *Northeast Cellular Tel. Co. v. FCC*, 897 F.2d 1164 (D.C. Cir. 1990) ("*Northeast Cellular*"); *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969) ("*WAIT Radio*").

[14] *See Northeast Cellular*, 897 F.2d at 1166.

[15] *See WAIT Radio*, 418 F.2d at 1157.

E. U.S. Table of Frequency Allocations

Intuitive Machines requests an additional waiver of the U.S. Table of Frequency Allocations ("U.S. Radio Table") to permit payload operations in the Ku-band and 5 GHz.[16]

i. 5 GHz, 802.11ac Wi-Fi Standard

The EagleCAM-2 payload will conduct short-range space-to-space radiocommunications between NOVA-C and the EagleCam CubeSat following its deployment approximately 30 meters above the lunar surface during lunar descent. Communications between the lander and EagleCAM-2 occur via short-range conventional Wi-Fi 802.11ac transmitters authorized under the Unlicensed National Information Infrastructure ("U-NII") framework promulgated under the Commission's Part 15 rules.[17] In the event the Commission determines the payload operations do not meet the requirements of the U-NII, Intuitive Machines respectfully requests the grant of a waiver for such use.

Good cause exists to grant a waiver of the U.S. Radio Table and no third party will experience or otherwise be prejudiced. The payload will operate at lower power levels than conventional Wi-Fi 802.11ac equipment, having a range of only tens of meters, and will operate only near or on the lunar surface. Therefore, no probability exists of harmful interference between the EagleCAM-2 and any authorized terrestrial operation in the proposed 5 GHz. Furthermore, strict adherence to the Part 15 U-NII rules in the instant situation would prove burdensome, and may prevent the EagleCAM-2 from joining the mission altogether. Sourcing alternative radios that enjoy the same compact form factor, that can be ruggedized to operate in the harsh lunar

[16] *See* 47 C.F.R. § 2.106.

[17] *See* 47 C.F.R. §§ 15.401-407.

environment, and draw modest power levels would be impractical and perhaps impossible for the IM-3 mission.

ii. Ku-band

The SSTEF-1 payload will demonstrate a general-purpose lunar testbed providing power and data services to individual experiments for testing at the lunar surface and lunar environmental exposure for technology demonstration experiments ("TDEs"). The facility will include active sensing and monitoring of the local environment external to SSTEF-1, providing environmental exposure data critical to experiment interpretation.

Good cause exists to waive the need for strict adherence to the U.S. Radio Table for the operation SSTEF-1. The 3D-printed antenna evaluation will transmit and receive single-tone narrowband emissions in the 14.5-14.8 GHz band, with a nominal center frequency of 14.7 GHz. Transmissions will be low power, with a maximum EIRP of -14 dBW. All transmissions will be enclosed within the Nova-C lander body, which adds >10 dB of shielding, making the SSTEF-1's emissions undetectable out the enclosures of the SSTEF-1, and thus eliminating the possibility of interference with other systems.

F. Antenna Beam Contours

Intuitive Machines requests a final waiver concerning the obligation to provide antenna beam contours or plots for the SSTEF-1 payload.[18] The purpose of providing such contours or plots is to ensure that space station operators are responsible stewards of finite radiofrequency resources, and to expedite coordination and deconfliction efforts when necessary. Given that emissions generated by the SSTEF-1 are extremely faint, intentionally contained within the

[18] *See* 47 C.F.R. § 25.114.

reinforced enclosure of the payload, and undetectable at even short distances removed from the lander, strict adherence to this obligation serves no purpose in the instant context.

V. CONCLUSION

Based on the foregoing, Intuitive Machines respectfully requests that the Commission grant its request to amend the Initial Application to alter certain frequencies, revise payloads delivered as part of the IM-3 Mission, and permit additional space-to-space radiocommunications.

Respectfully submitted,

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