



312 File Number: **SATAMD2022051000049**

Filing Description

Question	Response
Description	For NOVA-C, also known as IM-1, a Lunar lander designed and built by Intuitive Machines, LLC to fly to the surface of the Moon between December 2022 and February of 2023 contracted under the NASA CLPS program.

Satellite
Information

Question	Response
Select Orbit Type	NGSO
Space Station or Satellite Network Name	NOVA-C
Estimated Lifetime of Satellite(s) From Date of Launch	1 Years
Will the space station(s) operate on a Common Carrier basis?	No

Operating
Frequency
Bands (2)

Nature of service	Description	Frequency Band(s)	Mode Type
Other Satellite Service (please specify)	Command Uplink	2025.0 MHz -2110.0 MHz	Receive
Other Satellite Service (please specify)	Telemetry, Tracking and Data Downlink	2200.0 MHz -2290.0 MHz	Transmit

**Orbital
Information For
Non-
Geostationary
Satellites**

Question	Response
Total Number of Satellites in the active constellation	1
Orbit Epoch Date	12/23/2022
Celestial Reference Body	Earth

Orbital Plane 1:

Question	Response
Number of Satellites in Plane	1
Inclination Angle	27.4 degrees
Right Ascension of Ascending Node	10.8 degrees
Argument of Perigee	177.0 degrees
Orbital Period	69120.0 seconds
Apogee	60000.0 km
Perigee	185.0 km
Active Service Arc Begin Angle with respect to Ascending Node	30.0 degrees
Active Service Arc End Angle with respect to Ascending Node	30.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	1.7

Receiving Beams 1:

Question	Response
Beam ID	THMU
Receive Beam Frequency	2025.0 MHz -2110.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	6.8 dBi
Antenna Pointing Error	0.5 degrees
Antenna Rotational Error	1.5 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-21.5 dB/K
Min. Saturation Flux Density	-353.0 dBW/m2
Max. Saturation Flux Density	-288.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	See Technical Appendix for list of ground stations.

Receiving
Channels (2)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
THU1	0.25	2035.5941	TT&C
THU2	0.25	2035.5941	TT&C

Transmitting
Beams 1:

Question	Response
Beam ID	THMD
Transmit Beam Frequency	2200.0 MHz -2290.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	5.0 dBi
Antenna Pointing Error	0.5 degrees
Antenna Rotational Error	1.5 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-25.8 dBW/Hz
Max. Transmit EIRP	12.5 dBW
Co- or Cross Polar Mode	C
Service Area Description	See Technical Appendix for list of ground stations.

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²
* BW:	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
4.0 kHz	-120.7	-120.8	-120.9	-121.0	-121.3	-121.6

Transmitting
Beams 2:

Question	Response
Beam ID	QHMD
Transmit Beam Frequency	2200.0 MHz -2290.0 MHz

Beam Type	Fixed
Polarization	RHCP
Peak Gain	5.0 dBi
Antenna Pointing Error	0.5 degrees
Antenna Rotational Error	1.5 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-37.3 dBW/Hz
Max. Transmit EIRP	18.0 dBW
Co- or Cross Polar Mode	C
Service Area Description	See Technical Appendix for list of ground stations.

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²
* BW:	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
4.0 kHz	-166.8	-166.8	-166.9	-167.1	-167.3	-167.6

Transmitting Beams 3:

Question	Response
Beam ID	THGD
Transmit Beam Frequency	2200.0 MHz -2290.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	15.0 dBi
Antenna Pointing Error	0.5 degrees

Antenna Rotational Error	0.7 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-14.8 dBW/Hz
Max. Transmit EIRP	23.5 dBW
Co- or Cross Polar Mode	C
Service Area Description	See Technical Appendix for list of ground stations.

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²
* BW:	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
4.0 kHz	-160.4	-160.5	-160.6	-160.7	-161.0	-161.3

Transmitting Beams 4:

Question	Response
Beam ID	QHGD
Transmit Beam Frequency	2200.0 MHz -2290.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	15.0 dBi
Antenna Pointing Error	0.5 degrees
Antenna Rotational Error	0.7 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-26.3 dBW/Hz

Max. Transmit EIRP	29.0 dBW
Co- or Cross Polar Mode	C
Service Area Description	See Technical Appendix for list of ground stations.

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²
* BW:	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
4.0 kHz	-155.8	-155.8	-155.9	-156.1	-156.3	-156.6

Transmitting
Channels (14)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
QH1	6.0	2250.0	Service Link
THM1	0.25	2210.6	TT&C
QH6	0.563	2250.0	Service Link
QH7	0.375	2250.0	Service Link
THM2	0.075	2210.6	TT&C
QH3	3.0	2250.0	Service Link
QH2	4.5	2250.0	Service Link
QH9	0.094	2250.0	Service Link
QHM1	0.03	2250.0	Service Link
QH5	0.75	2250.0	Service Link
QH4	1.5	2250.0	Service Link
QH11	0.03	2250.0	Service Link
QH8	0.188	2250.0	Service Link
QH10	0.045	2250.0	Service Link

Certification Questions

Question	Response
Are the applicable service area coverage requirements of 25.143(b)(2) (ii) and (iii), or 25.144(a)(3)(i), or 25.145 (c)(1) and (2), or 25.146(i)(1) and (2), or 25.148(c), or 25.225 met?	N/A
Are the applicable frequency tolerances of 25.202(e) and out-of-band emission limits of 25.202(f)(1),(2), and (3) met?	No
Are the cessation of emissions requirements of 25.207 met?	Yes
Are the applicable power-flux-density limits of 25.208 met, and is the appropriate technical showing provided within the application?	
For NGSO applications, are the applicable equivalent-power-flux-density limits of 25.208 met, and is the appropriate technical showing provided within the application?	N/A
Are the applicable full-frequency-reuse requirements of 25.210 met?	
If the application is for a 17/24 GHz BSS space station, will it be operated at an offset location with full power and interference protection in accordance with 25.262(b)?	

Attachments

File Name	Beam	Field	Attachment Type	Description
THMD.gxt	THMD	NGSO Antenna Gain Data	GXT file (*.gxt)	
THGD.gxt	THGD	NGSO Antenna Gain Data	GXT file (*.gxt)	
QHMD.gxt	QHMD	NGSO Antenna Gain Data	GXT file (*.gxt)	
QHGD.gxt	QHGD	NGSO Antenna Gain Data	GXT file (*.gxt)	
THMU.gxt	THMU	NGSO Antenna Gain Data	GXT file (*.gxt)	