UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION

RADIO STATION AUTHORIZATION

Name: Denali 20020, LLC
Call Sign: E120043
Authorization Type: Modification of License
File Number: SES-MOD-20161215-00947
Non Common Carrier **Grant date:** 03/13/2017 **Expiration Date:** 06/20/2027

Nature of Service: Fixed Satellite Service

Class of Station: Fixed Earth Stations

A) Site Location(s)

#	Site ID	Address	Latitude	Longitude	Elevation (Meters)	NAD	Special Provisions (Refer to Section H)
1)	1	66C TELEPORT DRIVE BREWSTER, OKANOGAN, WA 98812	48°8'47.0"N	119°41'29.0"W	380	83	

Licensee certifies antenna(s) comply with gain patterns specified in Section 25.209

Subject to the provisions of the Communications Act of 1934, The Communications Satellite Act of 1962, subsequent acts and treaties, and all present and future regulations made by this Commission, and further subject to the conditions and requirements set forth in this license, the grantee is authorized to construct, use and operate the radio facilities described below for radio communications for the term beginning June 20, 2012 (3 AM Eastern Standard Time) and ending June 20, 2027 (3 AM Eastern Standard Time) . The required date of completion of construction and commencement of operation is March 13, 2018 (3 AM Eastern Standard Time) . Grantee must file with the Commission a certification upon completion of construction and commencement of operation.

B) Particulars of Operations

The General Provision 1010 applies to all receiving frequency bands.
The General Provision 1900 applies to all transmitting frequency bands.
For the text of these provisions, refer to Section H.

#	Frequency (MHz)	Polarization Code	Emission	Tx/Rx Mode	Max EIRP /Carrier (dBW)	Max EIRP Density /Carrier (dBW/4kHz)	Associated Antenna	Special Provisions (Refer to Section H)	Modulation/ Services
1)	14000.0000-14500.0000	H,V	36M0F2D	Tx	77.84	38.30	1		Digital Data Carrier
2)	14000.0000-14500.0000	H,V	36M0F3F	Tx	74.30	47.30	1		Analog Video Carrier
3)	14000.0000-14500.0000	H,V	36M0F8W	Tx	77.84	38.30	1		Digital Data Carrier
4)	14000.0000-14500.0000	H,V	36M0G7W	Tx	77.84	38.30	1		Digital Data Carrier
5)	11450.0000-12200.0000	H,V	36M0F3F	Rx			1		Analog Video Carrier
6)	11450.0000-12200.0000	H,V	36M0F8W	Rx			1		Digital Data Carrier
7)	11450.0000-12200.0000	H,V	36M0G7W	Rx			1		Digital Data Carrier
8)	11450.0000-12200.0000	H,V	36M0F2D	Rx			1		Digital Video Carrier
9)	10950.0000-11200.0000	H,V	36M0F3F	Rx			1		Analog Video Carrier

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10)	10950.0000-11200.0000	H,V	36M0F8W	Rx			1		Digital Data Carrier
11)	10950.0000-11200.0000	H,V	36M0G7W	Rx			1		Digital Data Carrier
12)	10950.0000-11200.0000	H,V	36M0F2D	Rx			1		Digital Video Carrier
13)	14000.0000-14500.0000	H,V	36M0G7W	Tx	78.20	38.70	2		Digital Data Carrier
14)	11700.0000-12200.0000	H,V	36M0G7W	Rx			2		Digital Data Carrier
15)	14000.0000-14500.0000	H,V	1M00G7D	Tx	66.80	42.90	3		Digital Data Carrier
16)	14000.0000-14500.0000	H,V	36M0F3F	Tx	78.90	51.90	3		Analog Video Carrier
17)	14000.0000-14500.0000	H,V	36M0G7W	Tx	80.87	41.37	3		Digital Data Carrier
18)	14000.0000-14500.0000	H,V	72M0G7W	Tx	80.87	38.37	3		Digital Data Carrier
19)	13750.0000-14000.0000	H,V	1M00G7D	Tx	66.80	42.90	3		Digital Data Carrier
20)	13750.0000-14000.0000	H,V	36M0G7W	Tx	76.90	37.40	3		Digital Data Carrier
21)	13750.0000-14000.0000	H,V	72M0G7W	Tx	80.87	38.37	3		Digital Data Carrier
22)	11450.0000-12200.0000	H,V	1M00G7D	Rx			3		Digital Data Carrier
23)	11450.0000-12200.0000	H,V	36M0F3F	Rx			3		Analog Video Carrier
24)	11450.0000-12200.0000	H,V	36M0G7W	Rx			3		Digital Data Carrier
25)	11450.0000-12200.0000	H,V	72M0G7W	Rx			3		Digital Data Carrier
26)	10950.0000-11200.0000	H,V	1M00G7D	Rx			3		Digital Data Carrier
27)	10950.0000-11200.0000	H,V	36M0F3F	Rx			3		Analog Video Carrier
28)	10950.0000-11200.0000	H,V	36M0G7W	Rx			3		Digital Data Carrier
29)	10950.0000-11200.0000	H,V	72M0G7W	Rx			3		Digital Data Carrier
30)	14000.0000-14500.0000	H,V	1M00G7D	Tx	70.08	46.10	4		Digital Data Carrier
31)	14000.0000-14500.0000	H,V	36M0F2D	Tx	77.70	38.20	4		Digital Data Carrier
32)	14000.0000-14500.0000	H,V	36M0F3F	Tx	86.00	59.00	4		Analog Video Carrier
33)	14000.0000-14500.0000	H,V	72M0G7W	Tx	85.60	46.10	4		Digital Data Carrier

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B) Particulars of Operations

The General Provision 1010 applies to all receiving frequency bands.
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For the text of these provisions, refer to Section H.

#	Frequency (MHz)	Polarization Code	Emission	Tx/Rx Mode	Max EIRP /Carrier (dBW)	Max EIRP Density /Carrier (dBW/4kHz)	Associated Antenna	Special Provisions (Refer to Section H)	Modulation/ Services
34)	11450.0000-12200.0000	H,V	1M00G7D	Rx			4		Digital Data Carrier
35)	11450.0000-12200.0000	H,V	36M0F2D	Rx			4		Digital Data Carrier
36)	11450.0000-12200.0000	H,V	36M0F3F	Rx			4		Analog Video Carrier
37)	11450.0000-12200.0000	H,V	72M0G7W	Rx			4		Digital Data Carrier
38)	10950.0000-11200.0000	H,V	1M00G7D	Rx			4		Digital Data Carrier
39)	10950.0000-11200.0000	H,V	36M0F2D	Rx			4		Digital Data Carrier
40)	10950.0000-11200.0000	H,V	36M0F3F	Rx			4		Analog Video Carrier
41)	10950.0000-11200.0000	H,V	72M0G7W	Rx			4		Digital Data Carrier
42)	14000.0000-14500.0000	H,V,L,R	1M00G7D	Tx	65.17	41.20	5		Digital Data Carrier
43)	14000.0000-14500.0000	H,V,L,R	72M0G7W	Tx	81.22	38.67	5		Digital Data Carrier
44)	11450.0000-12200.0000	H,V,L,R	1M00G7D	Rx			5		Digital Data Carrier
45)	11450.0000-12200.0000	H,V,L,R	72M0G7W	Rx			5		Digital Data Carrier
46)	10950.0000-11200.0000	H,V,L,R	1M00G7D	Rx			5		Digital Data Carrier
47)	10950.0000-11200.0000	H,V,L,R	72M0G7W	Rx			5		Digital Data Carrier
48)	14000.0000-14500.0000	H,V,L,R	1M00G7D	Tx	67.50	43.50	6		Digital Data Carrier
49)	14000.0000-14500.0000	H,V,L,R	72M0G7W	Tx	86.00	43.50	6		Digital Data Carrier
50)	11450.0000-12200.0000	H,V,L,R	1M00G7D	Rx			6		Digital Data Carrier
51)	11450.0000-12200.0000	H,V,L,R	72M0G7W	Rx			6		Digital Data Carrier
52)	10950.0000-11200.0000	H,V,L,R	1M00G7D	Rx			6		Digital Data Carrier
53)	10950.0000-11200.0000	H,V,L,R	72M0G7W	Rx			6		Digital Data Carrier

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C) Frequency Coordination Limits

#	Frequency Limits (MHz)	Satellite Arc (Deg. Long.) East Limit	Satellite Arc (Deg. Long.) West Limit	Elevation (Degrees) East Limit	Elevation (Degrees) West Limit	Azimuth (Degrees) East Limit	Azimuth (Degrees) West Limit	Max EIRP Density toward Horizon (dBW/4kHz)	Associated Antenna(s)
1)	10950.0000-11200.0000	53.0W	188.0W	06.7	05.6	107.8	253.5		1
2)	11450.0000-12200.0000	53.0W	188.0W	06.7	05.6	107.8	253.5		1
3)	14000.0000-14500.0000	53.0W	188.0W	06.7	05.6	107.8	253.5	11.78	1
4)	14000.0000-14500.0000	61.5W	188.0W	12.1	05.6	114.8	253.5	2.77	2
5)	11700.0000-12200.0000	61.5W	188.0W	12.1	05.6	114.8	253.5		2
6)	10950.0000-11200.0000	53.0W	186.0W	06.7	06.9	107.8	251.9		3
7)	11450.0000-12200.0000	53.0W	186.0W	06.7	06.9	107.8	251.9		3
8)	14000.0000-14500.0000	53.0W	186.0W	06.7	06.9	107.8	251.9	9.64	3
9)	13750.0000-14000.0000	61.0W	61.0W	11.8	11.8	114.4	114.4	-6.52	3
10)	10950.0000-11200.0000	53.0W	188.0W	06.7	05.6	107.8	253.5		4
11)	11450.0000-12200.0000	53.0W	188.0W	06.7	05.6	107.8	253.5		4
12)	14000.0000-14500.0000	53.0W	188.0W	06.7	05.6	107.8	253.5	14.86	4
13)	10950.0000-11200.0000	53.0W	186.0W	06.7	06.9	107.8	251.9		5
14)	11450.0000-12200.0000	53.0W	186.0W	06.7	06.9	107.8	251.9		5
15)	14000.0000-14500.0000	53.0W	186.0W	06.7	06.9	107.8	251.9	0.64	5
16)	10950.0000-11200.0000	53.0W	188.0W	06.7	05.6	107.8	253.5		6
17)	11450.0000-12200.0000	53.0W	188.0W	06.7	05.6	107.8	253.5		6
18)	14000.0000-14500.0000	53.0W	188.0W	06.7	05.6	107.8	253.5	2.58	6

D) Points of Communications

The following stations located in the Satellite orbits consistent with Sections B and C of this Entry:

1) 1 to Permitted Space Station List
2) 1 to NSS- 9 (S2756) @ 177 W.L. (Netherlands-licensed)
3) 1 to INTELSAT 707 @ 53 W.L. (U.S.-licensed)
4) 1 to AMAZONAS 2 (S2793) @ 61 degrees W.L. (Brazil-licensed)
5) 1 to Yamal 300K @ 177 degrees W.L. (Russia-licensed)

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E) Antenna Facilities

Site ID	Antenna ID	Units	Diameter (meters)	Manufacturer	Model number	Site Elevation (Meters)	Max Antenna Height (Meters)	Special Provisions (Refer to Section H)
1	1	2	3.5	VERTEX	3.5KPK	380	4.3 AGL/ 384.3 AMSL	
	Max Gains(s): 50.9 dBi @ 11.0000 GHz 52.3 dBi @ 14.0000 GHz							
	Maximum total input power at antenna flange (Watts) = 400.00							
	Maximum aggregate output EIRP for all carriers (dBW) = 78.30							
1	2	1	3.7	GLOBAL STAR	GS-370	380	3.75 AGL/ 383.75 AMSL	
	Max Gains(s): 51.4 dBi @ 11.0000 GHz 52.7 dBi @ 14.0000 GHz							
	Maximum total input power at antenna flange (Watts) = 400.00							
	Maximum aggregate output EIRP for all carriers (dBW) = 78.72							
1	3	3	6.1	VERTEX	6.1KPK	380	6.1 AGL/ 386.1 AMSL	
	Max Gains(s): 55.5 dBi @ 11.0000 GHz 56.9 dBi @ 14.0000 GHz							
	Maximum total input power at antenna flange (Watts) = 750.00							
	Maximum aggregate output EIRP for all carriers (dBW) = 85.65							
1	4	2	9	VERTEX	9KPK	380	9.5 AGL/ 389.5 AMSL	
	Max Gains(s): 59.2 dBi @ 11.0000 GHz 60.4 dBi @ 14.0000 GHz							
	Maximum total input power at antenna flange (Watts) = 750.00							
	Maximum aggregate output EIRP for all carriers (dBW) = 89.15							
1	5	3	4.8	VERTEX	4.8 KPK	380	5 AGL/ 385 AMSL	
	Max Gains(s): 53.5 dBi @ 11.0000 GHz 55.2 dBi @ 14.0000 GHz							
	Maximum total input power at antenna flange (Watts) = 400.00							
	Maximum aggregate output EIRP for all carriers (dBW) = 81.22							
1	6	1	6.3	VERTEX	6.3 METER	380	6.3 AGL/ 386.3 AMSL	
	Max Gains(s): 55.7 dBi @ 11.0000 GHz 57.5 dBi @ 14.0000 GHz							
	Maximum total input power at antenna flange (Watts) = 750.00							
	Maximum aggregate output EIRP for all carriers (dBW) = 86.25							

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G) Antenna Structure marking and lighting requirements:

None unless otherwise specified under Special and General Provisions

H) Special and General Provisions

A) This RADIO STATION AUTHORIZATION is granted subject to the following special provisions and general conditions:

385 --- The use of the band 10.7-11.7 GHz (Space-to-Earth) and 12.75-13.25 GHz (Earth-to-Space) by the fixed-satellite service in the geostationary satellite orbit shall be limited to international systems, i.e. other than domestic systems. (NG52)

1010 --- Applicable to all receiving frequency bands. Emission designator indicates the maximum bandwidth of received signal at associated station(s). Maximum EIRP and maximum EIRP density are not applicable to receive operations.

1900 --- Applicable to all transmitting frequency bands. Authority is granted to transmit any number of RF carriers with the specified parameters on any discrete frequencies within associated band in accordance with the other terms and conditions of this authorization, subject to any additional limitations that may be required to avoid unacceptable levels of inter-satellite interference.

2916 --- Transmitter(s) must be turned off during antenna maintenance to ensure compliance with the FCC-specified safety guidelines for human exposure to radiofrequency radiation in the region between the antenna feed and the reflector. Appropriate measures must also be taken to restrict access to other regions in which the earth station's power flux density levels exceed the specified guidelines.

3219 --- All existing transmitting facilities, operations and devices regulated by the Commission must be in compliance with the Commission's radiofrequency (RF) exposure guidelines, pursuant to Section 1.1307(b)(1) through (b)(3) of the Commission's rules, or if not in compliance, file an Environmental Assessment (EA) as specified in Section 1.1311. See 47 CFR § 1.1307 (b) (5).

5208 --- The licensee shall take all necessary measures to ensure that the antenna does not create potential exposure of humans to radiofrequency radiation in excess of the FCC exposure limits defined in 47 CFR 1.1307(b) and 1.1310 wherever such exposures might occur. Measures must be taken to ensure compliance with limits for both occupational/controlled exposure and for general population/uncontrolled exposure, as defined in these rule sections. Compliance can be accomplished in most cases by appropriate restrictions, such as fencing. Requirements for restrictions can be determined by predictions based on calculations, modeling, or by field measurements. The FCC's OET Bulletin 65 (available on-line at www.fcc.gov/oet/rfsafety) provides information on predicting exposure levels and on methods for ensuring compliance, including the use of warning and alerting signs and protective equipment for workers.

90169 --- The applicant's request for a waiver of Section 25.283(c) of the Commission's rules, 47 C.F.R. § 25.283(c), is granted. Section 25.283(c) specifies that space stations must discharge all stored energy sources at end-of-life of the space station. Yamal 300K is a JSC Gazprom Space Systems spacecraft that was launched on November 2, 2012. Applicant states that Yamal 300K will retain a de minimis amount of residual nitrogen and xenon at end of life. Applicant states that there will be 250 grams of nitrogen in a tank volume of 39.3 liters, and 1 kilogram of xenon in each of two interconnected identical tanks, each with a volume of 38 liters. Compliance with Section 25.283(c) is not achievable except through direct retrieval of spacecraft. The information submitted is not sufficient to support a finding that the underlying purpose of Section 25.283(c) would be served by sealing the helium tanks without completely venting them. However, we grant a partial waiver of the rule because undue hardship would result from requiring modification of the space station at this time.

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H) Special and General Provisions

A) This RADIO STATION AUTHORIZATION is granted subject to the following special provisions and general conditions:

90301 --- Transmissions between the Denali 20020, LLC (Denali) earth station, Call Sign E120043, and the Yamal 300K space station are limited to the provision of gateway services in the 10.95-11.7 GHz (space-to-Earth) and 14.0-14.5 GHz (Earth-to-space) frequency bands. This authorization is limited to the earth station call sign E120043 and does not permit Yamal 300K to operate with any other earth station in the United States. The Schedule S and other technical information for the Yamal 300K in IBFS File No. SES-MFS-20150609-00349, as amended by SES-AFS-20160107-00003, are incorporated by reference into this authorization.

90346 --- Applicant's request for a waiver of Section 25.210(f) of the Commission's rules is GRANTED, as conditioned. Section 25.210(f) requires that space stations operating in the Fixed-Satellite Service in certain frequency bands, including 10.7-12.7 GHz and 13.75-14.5 GHz bands, employ full frequency reuse. 47 C.F.R. § 25.210(f). This requirement is part of the Commission's two-degree spacing policy, and the purpose is to ensure that scarce orbit and spectrum resources are used efficiently and to encourage the deployment of technologically innovative satellites. The Commission has waived this requirement where doing so would allow satellite capacity that would otherwise lay dormant to be used to provide service. Yamal 300K is in-orbit and will operate from the 177° W.L. orbital location regardless of whether we permit it to provide service in the United States. Yamal 300K is capable of full-frequency use on some, but not all, of the frequency bands requested for operations with the United States. We find that preventing Yamal 300K from offering its capacity in the United States would preclude the provision of Ku-band service in the U.S. from this orbit location, and it is in the public interest to grant a limited waiver of the full frequency reuse requirement for the 10.95-11.2 GHz and 14.0-14.25 GHz frequency bands. Limited waiver is granted subject to the condition that no compliant satellite is offering service to the United States in the 10.95-11.2 GHz and 14.0-14.25 GHz frequencies at that orbital location.

900407 --- The Permitted Space Station List (Permitted List) is a list of all geostationary space stations providing fixed-satellite service pursuant to a Commission license or grant of U.S. market access in the following bands:
3600-4200 MHz (space-to-Earth)
5850-6725 MHz (Earth-to-space)
10.95-11.2 GHz (space-to-Earth)
11.45-12.2 GHz (space-to-Earth)
13.75-14.5 GHz (Earth-to-space)
18.3-18.8 GHz (space-to-Earth)
19.7-20.2 GHz (space-to-Earth)
24.75-25.25 GHz (Earth-to-space)
28.35-28.6 GHz (Earth-to-space)
29.25-30 GHz (Earth-to-space)
Earth stations with "Permitted List" designated as a point of communication may access any space station on the Permitted List, provided the operations comply with the applicable "routine" uplink and downlink limits, are within the specific frequency bands authorized in the earth station license, have completed coordination with terrestrial stations pursuant to §25.203, and otherwise comply with all terms and conditions of both the earth station license and the space station grant.

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B) This RADIO STATION AUTHORIZATION is granted subject to the additional conditions specified below:

This authorization is issued on the grantee's representation that the statements contained in the application are true and that the undertakings described will be carried out in good faith.

This authorization shall not be construed in any manner as a finding by the Commission on the question of marking or lighting of the antenna system should future conditions require. The grantee expressly agrees to install such marking or lighting as the Commission may require under the provisions of Section 303(q) of the Communications Act. 47 U.S.C. § 303(q).

Neither this authorization nor the right granted by this authorization shall be assigned or otherwise transferred to any person, firm, company or corporation without the written consent of the Commission. This authorization is subject to the right of use or control by the government of the United States conferred by Section 706 of the Communications Act. 47 U.S.C. § 706. Operation of this station is governed by Part 25 of the Commission's Rules. 47 C.F.R. Part 25.

This authorization shall not vest in the licensee any right to operate this station nor any right in the use of the designated frequencies beyond the term of this license, nor in any other manner than authorized herein.

This authorization is issued on the grantee's representation that the station is in compliance with environmental requirements set forth in Section 1.1307 of the Commission's Rules. 47 C.F.R. § 1.1307.

This authorization is issued on the grantee's representation that the station is in compliance with the Federal Aviation Administration (FAA) requirements as set forth in Section 17.4 of the Commission's Rules. 47 C.F.R.§ 17.4.

The following condition applies when this authorization permits construction of or modifies the construction permit of a radio station.

This authorization shall be automatically forfeited if the station is not ready for operation by the required date of completion of construction unless an application for modification of authorization to request additional time to complete construction is filed by that date, together with a showing that failure to complete construction by the required date was due to factors not under control of the grantee.

Licensees are required to pay annual regulatory fees related to this authorization. The requirement to collect annual regulatory fees from regulatees is contained in Public Law 103-66, "The Omnibus Budget Reconciliation Act of 1993." These regulatory fees, which are likely to change each fiscal year, are used to offset costs associated with the Commission's enforcement, public service, international and policy and rulemaking activities. The Commission issues a Report and Order each year, setting the new regulatory fee rates. Receive only earth stations are exempt from payment of regulatory fees.

FCC Form 488