



**UNITED STATES OF AMERICA  
FEDERAL COMMUNICATIONS COMMISSION  
RADIO STATION AUTHORIZATION**

Name: Telesat Network Services, Inc.

Call Sign: E060351

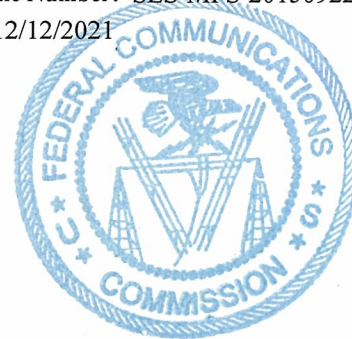
Authorization Type: Modification of License

File Number: SES-MFS-20150922-00603

Non Common Carrier

Grant date: 12/16/2015

Expiration Date: 12/12/2021



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)	4.6 T14	1305 INDUSTRIAL PARK ROAD MT. JACKSON, SHENANDOAH, VA 22842	38°43'47.5"N	78°39'30.1"W	275	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 December 12, 2006 (3 AM Eastern Standard Time) and ending December 12, 2021 (3 AM Eastern Standard Time) . The required date of completion of construction and commencement of operation is December 16, 2016 (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)	14000.5000-14499.5000	H,V	700KF9D	Tx	79.50	57.10	4.6 T14		TT&C AND RANGING
2)	14000.0000-14500.0000	H,V	1M22G1D	Tx	59.80	35.00	4.6 T14		1300 KBPS QPSK, FEC TPC, .553 SCPC
3)	14000.0000-14500.0000	H,V	2M13G1D	Tx	61.80	34.50	4.6 T14		2110 KBPS QPSK, FEC TPC, .495 SCPC
4)	13800.0000-14500.0000	H,V	13M8G7W	Tx	77.20	41.82	4.6 T14		9.913 MBPS QPSK, FEC TPC, 0.431, SCPC
5)	13800.0000-14500.0000	H,V	76K8G7W	Tx	77.20	64.36	4.6 T14		31.68 KBPS BPSK, FEC TPC, 0.495, SCPC
6)	13800.0000-14500.0000	H,V	76K8G7W	Tx	77.20	64.36	4.6 T14		63.36 KBPS QPSK, FEC TPC, 0.495, SCPC
7)	13800.0000-14500.0000	H,V	13M8G7W	Tx	77.20	41.82	4.6 T14		11.385 MBPS QPSK, FEC TPC, 0.495, SCPC



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#	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
8)	13800.0000-14500.0000	H, V	13M8G7W	Tx	77.20	41.82	4.6 T14	12.259 MBPS QPSK, FEC TPC, 0.533, SCPC	
9)	13800.0000-14500.0000	H, V	13M8G7W	Tx	77.20	41.82	4.6 T14	18.239 MBPS QPSK, FEC TPC, 0.793, SCPC	
10)	13800.0000-14500.0000	H, V	13M8G7W	Tx	77.20	41.82	4.6 T14	20.217 MBPS QPSK, FEC TPC, 0.879, SCPC	
11)	13800.0000-14500.0000	H, V	13M8G7W	Tx	77.20	41.82	4.6 T14	9.1195 MBPS BPSK, FEC TPC, 0.793, SCPC	
12)	13800.0000-14500.0000	H, V	6M90G7W	Tx	77.20	44.83	4.6 T14	5.6925 MBPS QPSK, FEC TPC, 0.495, SCPC	
13)	13800.0000-14500.0000	H, V	6M90G7W	Tx	77.20	44.83	4.6 T14	9.1195 MBPS QPSK, FEC TPC, 0.793, SCPC	
14)	13800.0000-14500.0000	H, V	76K8G7W	Tx	77.20	64.36	4.6 T14	27.584 KBPS BPSK, FEC TPC, 0.431, SCPC	
15)	13800.0000-14500.0000	H, V	76K8G7W	Tx	77.20	64.36	4.6 T14	34.112 KBPS BPSK, FEC TPC, 0.533, SCPC	
16)	13800.0000-14500.0000	H, V	76K8G7W	Tx	77.20	64.36	4.6 T14	50.752 KBPS BPSK, FEC TPC, 0.793, SCPC	
17)	13800.0000-14500.0000	H, V	76K8G7W	Tx	77.20	64.36	4.6 T14	55.168 KBPS QPSK, FEC TPC, 0.431, SCPC	
18)	13800.0000-14500.0000	H, V	76K8G7W	Tx	77.20	64.36	4.6 T14	56.256 KBPS BPSK, FEC TPC, 0.879, SCPC	
19)	13800.0000-14500.0000	H, V	76K8G7W	Tx	77.20	64.36	4.6 T14	68.224 KBPS QPSK, FEC TPC, 0.533, SCPC	
20)	13800.0000-14500.0000	H, V	13M8G7W	Tx	77.20	41.82	4.6 T14	10.1085 MBPS BPSK, FEC TPC, 0.879, SCPC	
21)	13800.0000-14500.0000	H, V	13M8G7W	Tx	77.20	41.82	4.6 T14	27.3585 MBPS 8PSK, FEC TPC, 0.793, SCPC	
22)	13800.0000-14500.0000	H, V	13M8G7W	Tx	77.20	41.82	4.6 T14	30,3255 MBPS 8PSK, FEC TPC, 0.879, SCPC	
23)	13800.0000-14500.0000	H, V	76K8G7W	Tx	77.20	64.36	4.6 T14	101.504 KBPS QPSK, FEC TPC, 0.793, SCPC	
24)	13800.0000-14500.0000	H, V	76K8G7W	Tx	77.20	64.36	4.6 T14	112.512 KBPS QPSK, FEC TPC, 0.879, SCPC	
25)	13800.0000-14500.0000	H, V	76K8G7W	Tx	77.20	64.36	4.6 T14	152.256 KBPS 8PSK, FEC TPC, 0.793, SCPC	



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File Number: SES-MFS-20150922-00603

Non Common Carrier

Grant date: 12/16/2015

Expiration Date: 12/12/2021

**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
26)	13800.0000-14500.0000	H, V	76K8G7W	Tx	77.20	64.36	4.6 T14		168.768 KBPS 8PSK, FEC TPC, 0.879, SCPC
27)	11700.0000-12200.0000	H, V	138KGXD	Rx			4.6 T14		TT&C AND RANGING
28)	11700.0000-12200.0000	H, V	1M07G7D	Rx			4.6 T14		1695 KBPS QPSK, FEC TPC .793 TDMA
29)	11700.0000-12200.0000	H, V	1M22G1D	Rx			4.6 T14		1300 KBPS QPSK, FEC TPC .553 SCPC
30)	11700.0000-12200.0000	H, V	319KG7D	Rx			4.6 T14		425 KBPS QPSK, FEC TPC .667 TDMA
31)	11700.0000-12200.0000	H, V	3M45G1W	Rx			4.6 T14		3.795 MBPS QPSK, FEC TPC, 0.66, TDMA
32)	11700.0000-12200.0000	H, V	76K8G7W	Rx			4.6 T14		12.72 KBPS 8PSK, FEC TPC, 0.66, TDMA
33)	11700.0000-12200.0000	H, V	76K8G7W	Rx			4.6 T14		42.24 KBPS BPSK, FEC TPC, 0.66, TDMA
34)	11700.0000-12200.0000	H, V	76K8G7W	Rx			4.6 T14		84.48 KBPS QPSK, FEC TPC, 0.66, TDMA
35)	11700.0000-12200.0000	H, V	2M13G1D	Rx			4.6 T14		2110 KBPS QPSK, FEC TPC .495 SCPC
36)	11700.0000-12200.0000	H, V	3M45G1W	Rx			4.6 T14		1.8975 MBPS BPSK, FEC TPC, 0.66, TDMA
37)	11700.0000-12200.0000	H, V	3M45G1W	Rx			4.6 T14		5.6925 MBPS BPSK, FEC TPC, 0.66, TDMA
38)	11700.0000-12200.0000	H, V	3M45G1W	Rx			4.6 T14		4.9565 MBPS BPSK, FEC TPC, 0.431, SCPC
39)	11700.0000-12200.0000	H, V	3M45G1W	Rx			4.6 T14		5.6925 MBPS BPSK, FEC TPC, 0.495, SCPC
40)	11700.0000-12200.0000	H, V	3M45G1W	Rx			4.6 T14		6.1295 MBPS BPSK, FEC TPC, 0.533, SCPC
41)	11700.0000-12200.0000	H, V	3M45G1W	Rx			4.6 T14		9.1195 MBPS BPSK, FEC TPC, 0.793M SCPC
42)	11700.0000-12200.0000	H, V	76K8G7W	Rx			4.6 T14		27.584 KBPS BPSK, FEC TPC, 0.431, TDMA
43)	11700.0000-12200.0000	H, V	76K8G7W	Rx			4.6 T14		34.112 KBPS BPSK, FEC TPC, 0.533, TDMA



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#	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
44)	11700.0000-12200.0000	H, V	76K8G7W	Rx			4.6 T14		50.752 KBPS BPSK, FEC TPC, 0.793, TDMA
45)	11700.0000-12200.0000	H, V	76K8G7W	Rx			4.6 T14		55.166 KBPS QPSK, FEC TPC, 0.431, TDMA
46)	11700.0000-12200.0000	H, V	76K8G7W	Rx			4.6 T14		68.224 KBPS QPSK, FEC TPC, 0.533, TDMA
47)	11700.0000-12200.0000	H, V	3M45G1W	Rx			4.6 T14		1.532375 MBPS BPSK, FEC TPC, 0.533 TDMA
48)	11700.0000-12200.0000	H, V	3M45G1W	Rx			4.6 T14		2.47825 MBPS QPSK, FEC TPC, 0.431, TDMA
49)	11700.0000-12200.0000	H, V	3M45G1W	Rx			4.6 T14		3.06475 MBPS QPSK, FEC TPC, 0.533, TDMA
50)	11700.0000-12200.0000	H, V	3M45G1W	Rx			4.6 T14		4.55975 MBPS QPSK, FEC TPC, 0.793, TDMA
51)	11700.0000-12200.0000	H, V	76K8G7W	Rx			4.6 T14		101.504 KBPS QPSK, FEC TPC, 0.793, TDMA
52)	11700.0000-12200.0000	H, V	76K8G7W	Rx			4.6 T14		152.256 KBPS 8PSK, FEC TPC, 0.793, TDMA
53)	11700.0000-12200.0000	H, V	3M45G1W	Rx			4.6 T14		1.239125 MBPS BPSK, FEC TPC, 0.431, TDMA
54)	11700.0000-12200.0000	H, V	3M45G1W	Rx			4.6 T14		2.279875 MBPS BPSK, FEC TPC, 0.793, TDMA
55)	11700.0000-12200.0000	H, V	3M45G1W	Rx			4.6 T14		6.839625 MBPS BPSK, FEC TPC, 0.793, TDMA
56)	11700.0000-12200.0000	H, V	480KG7D	Rx	0.00	0.00	4.6 T14		640 KBPS QPSK, FEC TPC .667 TDMA

**C) Frequency Coordination Limits**

#	Frequency Limits (MHz)	Satellite Arc (Deg. Long.)		Elevation (Degrees)		Azimuth (Degrees)		Max EIRP Density toward Horizon (dBW/4kHz)	Associated Antenna(s)
		East Limit	West Limit	East Limit	West Limit	East Limit	West Limit		
1)	11700.0000-12200.0000	7.0W	-148.0W	05.6	-07.3	101.7	-256.7	0	4.6 T14
2)	14000.0000-14500.0000	7.0W	-148.0W	05.6	-07.3	101.7	-256.7	-24.28	4.6 T14
3)	13800.0000-14500.0000	7.0W	-148.0W	05.6	-07.3	101.7	-256.7	-24.28	4.6 T14



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**D) Points of Communications**

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

- 1) 4.6 T14 to Permitted Space Station List
- 2) 4.6 T14 to Estrela do Sul 2 (S2821) @ 63 degrees W.L. (Brazil-licensed)
- 3) 4.6 T14 to MSAT-1 @ 107.5 degrees W.L. (Canadian Licensed) (Non-U.S.-licensed)
- 4) 4.6 T14 to MSAT-2 satellite (AMSC-1) @ 103.3 degrees W.L. satellite (U.S.-licensed)

**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)
4.6 T14	4.6 T14	1	4.6	VERTEX	4.6M KPC	275	2.2606 AGL/ 275 AMSL	
Max Gains(s):            54.8 dBi @    14.2500 GHz            53.3 dBi @    11.9500 GHz Maximum total input power at antenna flange (Watts) =            750.00 Maximum aggregate output EIRP for all carriers (dBW) =            79.50								

**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:
- 181 --- The user must provide the Naval Electromagnetic Spectrum Center (703-325-2750) a 24hr phone number (240-447-9573) which would be contacted when national defense and US naval operation requirements necessitate immediate cessation of operations. The applicant is aware that they would be required to temporarily cease satellite operations on these frequencies until notified otherwise.
  - 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.



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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:

- 2938 --- Upon completion of construction, each licensee must file with the Commission a certification including the following information: (1) name of the licensee, (2) file number of the application, (3) call sign of the antenna, (4) date of the license, (5) certification that the facility as authorized has been completed, (6) certification that each antenna facility has been tested and is within 2 dB of the pattern specified in Section 25.209, and (7) certification that the station is operational (including the date of commencement of service) and will remain operational during the license period unless the license is submitted for cancellation.
- 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](http://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.
- 5216 --- All operations shall be on a non-common carrier basis.
- 5689 --- Fixed, temporary fixed, and mobile earth terminals authorized under a VSAT or other blanket license shall comply, as appropriate, with the notification and advance consultation provisions of Section 25.203(e), (f), (g), and (i) with the installation of each individual earth terminal falling within the protected radio zones defined in 25.203. This portion of the FCC Rules and Regulations provide protection from harmful interference to certain sensitive radio facilities located within the USA. These protected facilities include the National Radio Astronomy Observatory at Green Bank, West Virginia (25.203(f); Arecibo Observatory, Arecibo, Puerto Rico (25.203(i)); the Department of Commerce's research laboratories located within the Table Mountain Radio Receiving Zone, Boulder County, Colorado (25.203(e)); and the Federal Communications Commission's monitoring stations (25.203(g)).



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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 does not meet each required construction deadline by the required date of completion unless, before such date(s), a specific application is timely filed to request an extension of the construction deadline(s), supported with good cause why that failure to construct 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.**