E140121 SES-STA-20180207-00097 IB2018000346
Intelsat License LLC

Approved by OMB
3060–0678

# APPLICATION FOR EARTH STATION SPECIAL TEMPORARY AUTHORITY

APPLICANT INFORMATIONEnter a description of this application to identify it on the main menu:
Request for 180–Day STA Using Hagerstown, Maryland Earth Station E140121 to Provide LEOP Services for SES–12

**1. Applicant**

| | | | |
|---|---|---|---|
| **Name:** | Intelsat License LLC | **Phone Number:** | 703–559–7848 |
| **DBA Name:** | | **Fax Number:** | 703–559–8539 |
| **Street:** | c/o Intelsat Corporation | **E–Mail:** | susan.crandall@intelsat.com |
| | 7900 Tysons One Place | | |
| City: | McLean | **State:** | VA |
| **Country:** | USA | **Zipcode:** | 22102 –5972 |
| **Attention:** | Susan H. Crandall | | |

GRANTED
International Bureau

File # SES-STA-20180207-00097
Call Sign E140121 Grant Date 3-29-18
(or other identifier)
Term Dates
From: 4-18-18 To: 10-15-18
Approved:

Applicant: Intelsat License LLC
Call Sign: E140121
File No.: SES-STA-20180207-00097
Special Temporary Authority (STA)

GRANTED
International Bureau

File # SES-STA-20180207-00097
Call Sign E140121 Grant Date 3-29-18
(or other identifier)
Term Dates
From: 4-18-18 To: 10-15-18
Approved:

Intelsat License LLC is granted STA, for 180 days, beginning April 18, 2018 to provide launch and early orbit phase ("LEOP") services for the Netherlands licensed SES-12 satellite at the in-orbit testing location 81.5° E and permanent orbital location 95° E from Hagerstown, Maryland located at 39° 35' 53.1" N, 077° 45' 22.0" W. The services will be under the following conditions:

1. Intelsat will perform LEOP operations in the 13998 MHz, 13996.5 MHz, 13999.5 MHz, 14494.5 MHz, 144960 MHz, 14497.5 MHz, and 14499.0 MHz frequencies (CP) (Earth-to-space) and in the 11499.5 MHz and 11703.5 MHz frequencies (CP) (space-to-Earth) with the coordinated emission carrier 800KF7D, eirp, and eirp density levels.

2. Operations in the 13.75-14.00 GHz shall be comply with Footnote US356.

3. Operations in the frequency range 14.47 to 14.5 GHz, should be coordinated with the National Science Foundation, Dr. Glen Langston, 703-292-4937, or glangston@nsf.gov

4. Operations, shall not cause harmful interference to, and shall not claim protection from, interference caused to it by any other lawfully operating station and it shall cease transmission(s) immediately upon notice of such interference.

5. In the event of any harmful interference under this grant of STA, Intelsat License LLC E140121 must cease operations immediately upon notification of such interference, and must inform the Commission, in writing, immediately of such an event.

6. The LEOP operations must be coordinated with all operators of satellites that use the same frequency bands and are in the LEOP path. All operators of satellites in that path will be provided with an emergency phone number where the licensee can be reached in the event that harmful interference occurs. Currently the 24x7 contact information for the SES-12 satellite LEOP mission is as follows: Ph.: (703) 559-7701 - East Coast Operations Center (primary); (310) 525-5591 - West Coast Operations Center (back-up). Request to speak with Harry Burnham or Kevin Bell.

7. Grant of this authorization is without prejudice to any determination that the Commission may make regarding pending or future Intelsat License LLC applications.

8. Any action taken or expense incurred as a result of operations pursuant to this STA is solely at Intelsat License LLC's risk.

This action is issued pursuant to Section 0.261 of the Commission's rules on delegated authority, 47 C.F.R. §0.261, and is effective immediately.

**2. Contact**

| | | | |
|---|---|---|---|
| **Name:** | Susan H. Crandall | **Phone Number:** | 703–559–7848 |
| **Company:** | Intelsat Corporation | **Fax Number:** | 703–559–8539 |
| **Street:** | 7900 Tysons One Place | E–Mail: | susan.crandall@intelsat.com |
| **City:** | McLean | **State:** | VA |
| **Country:** | USA | **Zipcode:** | 22102 –5972 |
| **Attention:** | | **Relationship:** | Legal Counsel |

(If your application is related to an application filed with the Commission, enter either the file number or the IB Submission ID of the related application. Please enter only one.)
3. Reference File Number or Submission ID

4a. Is a fee submitted with this application?
◉ If Yes, complete and attach FCC Form 159. If No, indicate reason for fee exemption (see 47 C.F.R.Section 1.1114).
○ Governmental Entity ○ Noncommercial educational licensee
○ Other(please explain):

4b. Fee Classification CGX – Fixed Satellite Transmit/Receive Earth Station

5. Type Request

○ Use Prior to Grant ○ Change Station Location ◉ Other

| | |
|---|---|
| 6. Requested Use Prior Date | |
| 7. CityHagerstown | 8. Latitude<br>(dd mm ss.s h) 39 35 53.1 N |

| 9. State MD | 10. Longitude<br>(dd mm ss.s h) 77 45 22.3 W |
|---|---|

11. Please supply any need attachments.

Attachment 1: STA Request  Attachment 2: Exhibit A  Attachment 3: Exhibit B

12. Description. (If the complete description does not appear in this box, please go to the end of the form to view it in its entirety.)

Intelsat License LLC herein requests a grant of Special Temporary Authority for 180 days, commencing April 18, 2018, to use its Hagerstown, Maryland Ku-band earth station, call sign E140121, to provide launch and early orbit phase services for the SES-12 satellite. SES-12 is expected to be launched on April 18, 2018. Intelsat expects the LEOP period to

13. By checking Yes, the undersigned certifies that neither applicant nor any other party to the application is subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti–Drug Act of 1988, 21 U.S.C. Section 862, because of a conviction for possession or distribution of a controlled substance. See 47 CFR 1.2002(b) for the meaning of "party to the application" for these purposes.

◉ Yes ○ No

| 14. Name of Person Signing<br>Susan H. Crandall | 15. Title of Person Signing<br>Assoc. General Counsel, Intelsat Corporation |
|---|---|

WILLFUL FALSE STATEMENTS MADE ON THIS FORM ARE PUNISHABLE BY FINE AND / OR IMPRISONMENT (U.S. Code, Title 18, Section 1001), AND/OR REVOCATION OF ANY STATION AUTHORIZATION (U.S. Code, Title 47, Section 312(a)(1)), AND/OR FORFEITURE (U.S. Code, Title 47, Section 503).

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**12. Description**

Intelsat License LLC herein requests a grant of Special Temporary Authority for 180 days, commencing April 18, 2018, to use its Hagerstown, Maryland Ku-band earth station, call sign E140121, to provide launch and early orbit phase services for the SES-12 satellite. SES-12 is expected to be launched on April 18, 2018. Intelsat expects the LEOP period to last approximately 180 days.

**Intelsat License LLC**
**Hagerstown, Maryland**

**ViaSat 13.5 Meter Earth Station**

**1. Background**

This Exhibit is presented to demonstrate the extent to which the Intelsat License LLC ("Intelsat") satellite earth station in Hagerstown, Maryland is in compliance with the Federal Communications Commision ("FCC") Report and Order 96-377. The potential inteference from the earth station to U.S. Navy shipboard radiolocation operations ("RADAR") and the National Aeronautics and Space Administration ("NASA") space research activities in the 13.75-14.0 GHz band is addressed in this exhibit. The parameters for the earth station are:

| | |
|---|---|
| Coordinates (NAD83): | 39° 35' 53.1" N, 77° 45' 22.3" W |
| Satellite Arc Range for Earth Station: | SES-12 at 149°W to 6°W |
| Frequency Band: | 13.75-14.00 GHz |
| Polarizations: | Linear & Circular |
| Emissions: | 800KF7D |
| Modulation: | FM/BPSK/NRZ-L |
| Maximum Aggregate Uplink EIRP: | 88.6dBW for all Carriers |
| **Transmit Antenna Characteristics** | |
| Antenna Size: | 13.5 Meters in Diameter |
| Anenna Type/Model: | ViaSat |
| Gain: | 64 dBi |
| RF Power into Antenna Flange: | 24.6 dBW or 1.6 dBW/4kHz |
| Minimum Elevation Angle: | 5.29° @ 101.86° Azimuth |
| | 5.69° @ 257.75° Azimuth |
| Side Lobe Antenna Gain | FCC Reference Pattern |

Because the above uplink spectrum is shared with the Federal Government, coordination in this band requires resolution data pertaining to potential interference between the earth stations and both U.S. Navy Department and NASA systems. Potential intefference from the earth station could impact the U.S. Navy and/or NASA systems in two areas. These areas are noted in GCC Report and Order 96-377 dated September 1996, and consist of (1) Radiolocation and Radio Navigation, (2) Data Relay Satellites.

Summary of Coordination Issues:

a.) Potential Impact to Government Radiolocation (Shipboard Radar)
b.) Potential Impact to NASA Tracking and Data Relay Satellite Systems ("TDRSS")

**2. Potential Impact to Government Radiolocation (Shipboard Radar)**

Radiolocation operations ("RADAR") may occur anywhere in the 13.4-14.0 GHz frequency band aboard ocean-going U.S. Navy ships. FCC order 96-377 allocates the top 250MHz of this 600 MHz band to the Fixed Satellite Service ("FSS") on a co-primary basis with the radiolocation operations and provides for an interference protection level of -167 dBW/$m^2$/4kHz.

The closest distance to the shoreline from Hagerstown, Maryland earth station is approximately 131 km. The calculation of the power spectral density at this distance is given by:

| | | |
|---|---|---|
| 1. | Clear Sky EIRP: | 88.6 dBW |
| 2. | Carrier Bandwidth: | 800 kHz |
| 3. | PD at antenna input: | 1.6 dBW/4kHz |
| 4. | Transmit Antenna Gain: | 64 dBi |
| 5. | Antenna Gain to Horizon: | 10.9 dBi |
| 6. | Antenna Elevation Angles: | 5.3° @ 101.9° azimuth |
| | | 5.7° @ 257.8° azimuth |

The earth station will radiate interference toward the ocean according to its off-axis side-lobe performance. A conservative analysis, using FCC standard reference pattern, results in an off-axis antenna gain of 10.9 towards the nearest shoreline.

The signal density at the shoreline, through free space is:

PFD = Antenna Feed Power density (dBW/4kHz) + Antenna Off-Axis Gain (dBi) - Spread Loss (dBW/$m^2$)

= 1.6dBW/4kHz + 10.9dBi - (10*log[4*PI*[131km]^2))

= -100.8 dBW/m/4kHz - Additional Path Losses (69 dB)

Our calculation indicate additional path loss of approximately 69 dB including absorbtion loss and earth diffraction loss for the actual path profiles from the earth station to the nearest shoreline.

The calculated PFD, including additional path losses to the closest shoreline, is -169.8dbW/ m^2/4 kHz. This is 2.8dB below the -167.0 dBW/ m^2/4 kHz interference criteria of the R&O 96-377. Therefore, there should be no interference to the U.S. Navy RADAR from the Hagerstown, Maryland earth station due to the distance and the terrain blockage between the site and the shore.

**3. Potential Impact to NASA's Tracking and Data Relay Satellite System**

The geographic location of the Intelsat earth station in Hagerstown, Maryland is outside the 390 km radius coordination contour surrounding NASA's White Sands, New Mexico ground station complex. Therefore the TDRSS space-to-earth link will not be impacted by the Intelsat earth station in Hagerstown, Maryland.

The TDRSS space-to-space link in the 13.772 to 13.778 GHz band is assumed to be protected if an earth station produces and EIRP of less than 71 dBW/6MHz in this band. The 13.5 meter earth station antenna will not transmit in this band. Therefore, there will be no potential interference to the TDRSS space-to-space link.

**4. Coordination Result Summary and Conclusions**

The results of the analysis and calculation performed in this exhibit indicate that compatible operation between the earth station at the Hagerstown, Maryland facility and U.S. Navy and NASA TDRSS space-to-earth and space-to-space links are possible. No interference to U.S. Navy RADAR or NASA TDRSS operations from the Hagerstown, Maryland site earth station should occur.

INTELSAT.
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February 7, 2018

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: Request for Special Temporary Authority
Hagerstown, Maryland Earth Station E140121

Dear Ms. Dortch:

Intelsat License LLC ("Intelsat") herein requests a grant of Special Temporary Authority ("STA")[1] for 180 days, commencing April 18, 2018, to use its Hagerstown, Maryland Ku-band earth station—call sign E140121—to provide launch and early orbit phase ("LEOP") services for the SES-12 satellite. SES-12 is expected to be launched on April 18, 2018.[2] Intelsat expects the LEOP period to last approximately 180 days.[3]

The SES-12 LEOP operations will be performed at the following frequencies: 13998.0 MHz, 13996.5 MHz, 13999.5 MHz, 14494.5 MHz, 14496.0 MHz, 14497.5 MHz, and 14499.0 MHz (CP) in the uplink; and 11499.5 MHz and 11703.5 MHz (CP) in the downlink. The LEOP operations will be coordinated with all operators of satellites that use the same frequency bands and are in the LEOP path.[4] All operators of satellites in that path will be provided with an emergency phone number where the licensee can be reached in the event that harmful interference occurs.

The 24x7 contact information for the SES-12 LEOP mission is as follows:

Ph.: (703) 559-7701 – East Coast Operations Center (primary)
(310) 525-5591 – West Coast Operations Center (back-up)

Request to speak with Harry Burnham or Kevin Bell.

In further support of this request, Intelsat herewith attaches Exhibits A and B, which contain a coordination report and waiver requests. In the extremely unlikely event that harmful interference

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1 Intelsat has filed its STA request, FCC Form 159, a $200.00 filing fee, and this supporting letter electronically via the International Bureau's Filing System ("IBFS").

2 The in-orbit testing location for SES-12, which Intelsat understands is licensed by the Netherlands, will be 81.5° E.L. The final location of SES-12 will be 95.0° E.L.

3 Intelsat is seeking authority for 180 days to accommodate the longer orbit-raising time period required for an electric propulsion satellite.

4 Airbus, the manager of the SES-12 LEOP mission, will handle the coordination.

should occur due to transmissions to or from its earth station, Intelsat will take all reasonable steps to eliminate the interference.

Finally, Intelsat clarifies that during the SES-12 LEOP mission, Airbus will serve as the mission manager. Airbus will build and send the commands to the Intelsat antenna, which will process and execute the commands. Telemetry received by Intelsat will be forwarded to Airbus. Intelsat will perform the ranging sessions by sending a tone to the spacecraft periodically. Intelsat will remain in control of the baseband unit, RF equipment, and antenna.

Grant of this STA request will allow Intelsat to help launch the SES-12 satellite. This, in turn, will help provide additional capacity from the 95.0 E.L. orbital location and thereby promotes the public interest.

Please direct any questions regarding this STA request to the undersigned at (703) 559-6949.

Respectfully submitted,

*/s/ Susan H. Crandall*
Susan H. Crandall
Associate General Counsel
Intelsat Corporation

cc: Paul Blais

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February 26, 2018

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: Request for Special Temporary Authority to Provide LEOP Services for SES-12
Hagerstown, Maryland Earth Station E140121, File No. SES-STA-20180207-00097

Dear Ms. Dortch:

Intelsat License LLC ("Intelsat") hereby supplements its above-referenced pending application to reduce the proposed maximum aggregate uplink equivalent isotropically radiated power ("EIRP") level in the 13.75-14.0 GHz band from 88.6 dBW to 85 dBW to comply with Section 2.106, Table of Allocations footnote US356 of the Federal Communications Commission's rules.[1] Intelsat will operate using an 800KF7D emissions carrier with the following maximum EIRP density levels:

| **Max EIRP Density/ 1 Hz (dBW)** | **Max EIRP Density/ 4 KHz (dBW)** | **Max EIRP Density/ 6 MHz (dBW)** |
|---|---|---|
| 25.97 | 61.99 | 93.75 |

Please direct any questions regarding this STA request to the undersigned at (703) 559-6949.

Respectfully submitted,

*/s/ Susan H. Crandall*
Susan H. Crandall
Associate General Counsel
Intelsat Corporation

cc: Paul Blais

1 47 C.F.R. § 2.106 footnote US356.