Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of Application by	)	
	)	
SES AMERICOM, INC.	)	Call Signs KA288, E920698
	)	
For Special Temporary Authority to	)	
Communicate with ASTRA 3A to Perform	)	
TT&C During Relocation to 176.85º W.L.	)	
And On-Station at 176.85° W.L.	)	

REQUEST FOR SPECIAL TEMPORARY AUTHORITY

By this application, SES Americom, Inc. ("SES Americom") respectfully requests earth station special temporary authority ("STA") for a period of 180 days, beginning on or about October 11, 2013, to permit SES to communicate with the ASTRA 3A spacecraft in order to provide Tracking, Telemetry and Command ("TT&C"): (1) during the planned relocation of the spacecraft from its current position at 23.7º E.L. to 176.85º W.L.; and (2) once the satellite arrives on-station at 176.85° W.L. (+/- 0.10° east/west stationkeeping). The call signs of the earth stations for which STA is requested are listed in the caption above. One of the earth stations (Call Sign E920698) will be used for drift only. The other earth station (Call Sign KA288) will be used for drift and on-station TT&C at 176.85° W.L. At that orbital location, ASTRA 3A will provide commercial service in the Ku-band frequencies to eastern Russia.[1]

SES Americom's affiliate, SES ASTRA S.A. ("SES ASTRA"), holds an authorization from the Luxembourg Ministry of State, Office of Media and Communications[2] for

[1] ASTRA 3A will provide service to eastern Russia using the 11.45-11.7 GHz and 12.5-12.75 GHz space-to-Earth (downlink) bands and the 14.0-14.5 GHz Earth-to-space (uplink) bands.

[2] Ministère d'État, Service des Médias et des Communications of the Grand Duchy of Luxembourg.

the ASTRA 3A Ku-band spacecraft. SES ASTRA has requested that SES Americom provide TT&C to support the planned relocation of ASTRA 3A to 176.85º W.L. Upon arrival at the nominal 177º W.L. orbital location, ASTRA 3A will join the NSS-9 spacecraft and will operate in inclined orbit pursuant to an authorization from the Netherlands held by New Skies Satellites B.V. ("New Skies").[3]

SES Americom's application is limited to a request for authority to use two U.S. earth stations to perform TT&C with ASTRA 3A using certain Ku-band frequencies. SES is not seeking U.S. market access or any other authorization from the Commission in relation to the non-U.S.-licensed ASTRA 3A spacecraft, and therefore is not providing full technical information about the ASTRA 3A satellite as part of this application.[4] Details regarding the ASTRA 3A TT&C operations, including link budgets and interference analysis, are provided in Attachment 1 to this request. A basic technical description of the satellite's proposed operations over eastern Russia, and an orbital debris mitigation statement for ASTRA 3A, are provided in Attachment 2 and Attachment 3, respectively, for the Commission's information.

As discussed below, communications with ASTRA 3A will not adversely affect the operation of any adjacent satellites. Relocation of ASTRA 3A is scheduled to begin later this year, and SES seeks action on this request no later than October 11, 2013, to accommodate that schedule. ASTRA 3A is expected to remain at 176.85° W.L. until its projected end-of-life.

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[3] The U.N. registration of the ASTRA 3A spacecraft will not change at 176.85° W.L. *See* Permanent Mission of Luxembourg, *Note Verbale*, A/AC.105/INF.412 (Dec. 5, 2005) (providing information for ASTRA 3A to the UN Committee on the Peaceful Uses of Outer Space in conformity with General Assembly resolution 1721 B (XVI) by States launching objects into orbit or beyond). SES Americom, SES ASTRA and New Skies are all wholly owned affiliates of SES S.A. ("SES").

[4] *See* Waiver Requests, *infra*.

Grant of STAs Will Serve the Public Interest. Grant of this STA request is in the public interest. The requested TT&C authority will facilitate the safe operation of ASTRA 3A during relocation of the spacecraft and on-station at 176.85° W.L.

No Harmful Interference to Other Spacecraft. TT&C transmissions during drift of ASTRA 3A will be on a non-harmful interference basis. The drift of the spacecraft will be coordinated with other satellite operators consistent with industry practice.[5]

At 176.85° W.L., the nearest Ku-band satellite (Intelsat 18) is more than three degrees away at 180° W.L. Accordingly, the proposed use of large, two-degree-spacing compliant earth stations to perform TT&C with ASTRA 3A at 176.85° W.L. poses no risk of harmful interference to adjacent satellites.[6]

Waiver Requests. SES requests limited waivers of the Commission's requirements in connection with the instant STA request. Grant of these waivers is consistent with Commission policy:

> The Commission may waive a rule for good cause shown. Waiver is appropriate if special circumstances warrant a deviation from the general rule and such deviation would better serve the public interest than would strict adherence to the general rule. Generally, the Commission may 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.[7]

Sections 25.137 and 25.114. SES requests a waiver of Section 25.137 and the other Commission rules cross-referenced therein. SES seeks special temporary authority in

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[5] The 24/7 point of contact for the proposed ASTRA 3A operations is the SES Payload Management Operations Centre (PMOC) in Woodbine, MD, 1 800 772 2363 or 1 410 970 7570; e-mail: PMOC@ses.com.

[6] *See* Attachment 1.

[7] *PanAmSat Licensee Corp.*, 17 FCC Rcd 10483, 10492 (Sat. Div. 2002) (footnotes omitted).

connection with TT&C for ASTRA 3A, a foreign-licensed spacecraft. Section 25.137 requires that applicants proposing to use U.S.-licensed earth stations to communicate with foreign-licensed spacecraft demonstrate that the Commission's policies for U.S. market access are satisfied. Section 25.137 also incorporates by reference other requirements for Commission-licensed space stations, including the obligation to file detailed technical information as specified in Section 25.114.

By its terms, Section 25.137 is inapplicable to the instant STA request. The rule's requirements come into play only when a non-U.S.-licensed satellite is to be used to "serve the United States."[8] Here, the SES earth stations will be used solely for TT&C, not for commercial operations. Thus, SES is not seeking to have its earth stations communicate with ASTRA 3A for purposes of providing U.S. service within the meaning of Section 25.137.

To the extent the Commission disagrees, SES requests a waiver of the market access and other requirements imposed in Section 25.137. Grant of a waiver will not undermine the objectives of these requirements. The market access test described in the rule is intended to ensure that U.S.-licensed systems have "effective competitive opportunities."[9] Because SES Americom is not seeking authority to provide commercial services in the United States, the requested STA does not raise any concerns about competitive equality.[10]

Strict adherence with Section 25.114's requirements for detailed technical information is also unnecessary and would be unduly burdensome. SES Americom is proposing

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[8] 47 C.F.R. § 25.137(a).

[9] *Id.*

[10] In any event, the ASTRA 3A spacecraft at 176.85° W.L. will be operating under the authority of The Netherlands, a WTO member country, and therefore is exempt from the requirement to make a showing of effective competitive opportunities. 47 C.F.R. § 25.137(a)(2).

only to use the earth stations for the limited purpose of TT&C during drift and on-station operations of the spacecraft at 176.85° W.L, and the relevant technical characteristics of those transmissions are described herein. The planned drift will be coordinated with nearby satellite operators, consistent with industry practice, and transmissions to the spacecraft will be conducted on a non-harmful interference basis. Upon arrival on-station, the spacecraft will be used to provide service outside the United States. In these circumstances, no valid purpose would be served by requiring a complete technical description of the ASTRA 3A spacecraft.

SES' request is consistent with Commission precedent. In similar cases in which limited communications by U.S. earth stations with a foreign-licensed satellite were proposed, the Commission has granted STA without requiring a market access showing under Section 25.137 or full technical data as required by Section 25.114.[11]

Section 2.106 Footnote NG104 and Section 25.202(a)(1) Footnote 2. To the extent that reception of telemetry at 11450.25 MHz and 11699.50 MHz constitutes a domestic (*i.e.*, non-international) service, SES Americom respectfully requests a limited waiver of the international-service-only restriction.[12] Such a waiver is warranted in the circumstances for the limited purpose of TT&C. As the Commission has recognized, TT&C operations generally require uplink and downlink capability from the same earth station. For this reason, the

[11] *See, e.g.*, PanAmSat Licensee Corp., File Nos. SES-STA-20090922-01211 (Call Sign E4132) & SES-STA-20090922-01212 (Call Sign E040125), both grant-stamped Oct. 16, 2009 (granting authority for earth stations to communicate with foreign-licensed NSS-12 spacecraft for purposes of providing launch and early operations services).

[12] 47 U.S.C. § 2.106 Footnote NG104; 47 U.S.C. § 25.202(a)(1) Footnote 2.

Commission has previously granted waivers of the international service restriction to enable TT&C to be performed in the U.S. using the extended Ku-band frequencies.[13]

Grant of the requested waiver would not undermine the purpose of the restriction, which is to ensure that earth station deployments in the extended Ku-band do not negatively impact the deployment of fixed service ("FS") in the same band or cause interference to such operations. The telemetry downlink from ASTRA 3A in the extended Ku-band are narrow in bandwidth, and will comply with the power flux density limits in the Commission's rules and, thus, will not interfere with FS station operations. Moreover, only a small number of U.S. earth stations will be used to perform TT&C in the extended Ku-band.[14] Once ASTRA 3A is on-station at 176.85W, TT&C will be performed by two U.S. earth stations: (1) the KA288 earth station in South Mountain, California, operated by SES Americom, and (2) an earth station in Honolulu, Hawaii, operated by Hawaii Pacific Teleport.[15] As a result, there will be no significant restrictions placed on the deployment of FS in this band.

Section 25.210(j). The ASTRA 3A satellite is authorized by the Netherlands to operate at 176.85° W.L. within a +/- 0.10° east/west stationkeeping box. To the extent necessary, SES Americom respectfully requests a waiver of Section 25.210(j) of the Commission's rules, which requires geostationary space stations to be operated within a +/- 0.05° east/west stationkeeping box. The Commission has previously waived this rule based

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[13] *See*, *e.g.*, EchoStar KuX Corporation, 20 FCC Rcd 919 (Int'l Bur. 2004) ("EchoStar 83W Order"); EchoStar Satellite LLC, 20 FCC Rcd 930 (Int'l Bur. 2004) ("EchoStar 109W Order"); EchoStar KuX Corporation, 20 FCC Rcd 942 (2004) ("EchoStar 121W Order").

[14] *See* EchoStar 83W Order at ¶ 16 ("The Commission has waived this [NG104] requirement where the number of potential earth stations in a particular service is inherently small."); EchoStar 109W Order at ¶ 16 (same); EchoStar 121W Order at ¶ 17 (same).

[15] Hawaii Pacific Teleport will be submitting a separate application to use its antenna to perform TT&C with ASTRA 3A.

on a finding that allowing an increased stationkeeping volume would "not adversely affect the operations of other spacecraft, and would conserve fuel for future operations." [16]

The facts here fit squarely within this precedent. Allowing ASTRA 3A to be maintained within an increased stationkeeping volume will not harm other operators. ASTRA 3A's stationkeeping volume will not overlap with that of any other satellites. In addition, allowing ASTRA 3A to be flown at 176.85° W.L. in an expanded east-west stationkeeping volume of +/-0.1 degrees will result in fuel savings for the spacecraft. This will prolong the time during which ASTRA 3A will be available to provide service to eastern Russia. Under these circumstances, grant of any necessary waiver of Section 25.210(j) will serve the public interest.

SES hereby certifies that no party to this application is subject to a denial of federal benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. § 862.

For the foregoing reasons, SES respectfully requests special temporary authority to communicate with ASTRA 3A for a period of up to 180 days in order to provide TT&C during relocation of the satellite and once it is on station, as described herein. Grant of the requested authority will promote safe operation of the satellite during its relocation.

Respectfully submitted,

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[16] *See* File Nos. SAT-MOD-20080124-00030 & SAT-AMD-20080311-00070, grant-stamped May 19, 2008, Attachment at ¶ 1.

Attachment 1: TT&C Emission Characteristics

1. Earth Station Transmission Characteristics

KA288 (South Mountain, CA -- drift and on-station)
Emission Designator: 800KF9D
Max EIRP: 85.20 dBW
Max EIRP Density: 58.20 dBW/4kHz

E920698 (Woodbine, MD -- drift only)
Emission Designator: 800KF9D
Max EIRP: 86.50 dBW
Max EIRP Density: 59.50 dBW/4kHz

These EIRP and EIRP density levels are the maximum EIRP and EIRP density levels authorized in the current E920698 and KA288 earth station licenses.

2. TT&C Frequencies

Telecommand:	14499 MHz vertical polarization
Telemetry:	11450.25 MHz horizontal polarization
	11699.50 MHz horizontal polarization

3. TT&C Link Budgets

South Mountain (KA288)

South Mountain - Telecommand		
Link Parameters	**Units**	**800KF9D**
Uplink Frequency	MHz	14499.00
Carrier Allocated Bandwidth	kHz	800.0
Uplink:		
Nominal E/S e.i.r.p. per carrier	dBW	81.1
Earth Station Diameter	m	6.1
Earth Station Gain	dBi	57.5
Uplink Input Power per Carrier	dBW	23.6
Uplink EIRP density	dBW/4kHz	58.1
Spreading Loss	dB	163.0
Other Losses	dB	1.1
SFD at satellite	dBW/m2	-83.0
CMD subsystem SFD Threshold	dBW/m2	-92.0
Margin	dB	9.0

South Mountain - Telemetry		
Link Parameters	**Units**	**150KF9D**
Downlink Frequency*	MHz	11450.25
Carrier Allocated Bandwidth	kHz	150.0
Downlink:		
Downlink e.i.r.p. (EOC)**	dBW	6.3
Free Space Loss	dB	205.6
Receive E/S Pointing Loss	dB	0.2
Receive E/S G/T	dB/K	34.0
Downlink C/No	dB	63.1
Required C/No	dB	44.5
Margin	dB	18.5

* This Link budget equally valid for the 11699.5 MHz Telemetry frequency
** +/- 30 deg Earth Coverage

Woodbine (E920698)

Woodbine - Telecommand		
Link Parameters	**Units**	**800KF9D**
Uplink Frequency	MHz	14499.00
Carrier Allocated Bandwidth	kHz	800.0
Uplink:		
Nominal E/S e.i.r.p. per carrier	dBW	82.0
Earth Station Diameter	m	9.2
Earth Station Gain	dBi	61.0
Uplink Input Power per Carrier	dBW	21.0
Uplink EIRP density	dBW/4kHz	59.0
Spreading Loss	dB	163.2
Other Losses	dB	1.1
SFD at satellite	dBW/m2	-82.3
CMD subsystem SFD Threshold	dBW/m2	-92.0
Margin	dB	9.7

Woodbine - Telemetry		
Link Parameters	**Units**	**150KF9D**
Downlink Frequency*	MHz	11450.25
Carrier Allocated Bandwidth	kHz	150.0
Downlink:		
Downlink e.i.r.p. (EOC)**	dBW	6.3
Free Space Loss	dB	205.8
Receive E/S Pointing Loss	dB	0.2
Receive E/S G/T	dB/K	38.0
Downlink C/No	dB	66.9
Required C/No	dB	44.5
Margin	dB	22.4

* This Link budget equally valid for the 11699.5 MHz TM frequency
** +/- 30 deg Earth Coverage

4. Two-Degree Interference Analysis

This analysis assumes that ASTRA-3A has a hypothetical neighbor at an orbital separation of 2°, with the same TT&C transmission parameters as the ASTRA-3A satellite. The interference between the two systems then is only in the TT&C carriers. The Tables below show the interference analysis for the telecommand and telemetry carriers, and it can be seen from the results that the C/I margins in the analyses are positive.

South Mountain (KA288)

ASTRA-3A Telecommand		
Input Power	(dBW)	23.6
Off-axis EIRP	(dBW)	44.6
Hypothetical satellite		
uplink EIRP	(dBW)	81.1
Required C/I	(dB)	15.0
Interference analysis		
Calculated C/I (single satellite)	(dB)	36.5
Calculated C/I (two satellites)	(dB)	33.5
Margin	**(dB)**	**18.5**

ASTRA-3A - Telemetry		
downlink EIRP	(dBW)	6.3
Hypothetical satellite		
Downlink EIRP (EOC)	(dBW)	6.3
Receive earth station size	(m)	6.1
Receive earth station gain	(dBi)	55.4
Receive earth station off-axis	(dBi)	21.0
Required C/I	(dB)	15.0
Interference analysis		
Calculated C/I (single satellite)	(dB)	34.4
Calculated C/I (two satellites)	(dB)	31.4
Margin	(dB)	**16.4**

Woodbine (E920698)

ASTRA-3A Telecommand		
Input Power	(dBW)	21.0
Off-axis EIRP	(dBW)	42.0
Hypothetical satellite		
uplink EIRP	(dBW)	82.0
Required C/I	(dB)	15.0
Interference analysis		
Calculated C/I (single satellite)	(dB)	40.0
Calculated C/I (two satellites)	(dB)	37.0
Margin	**(dB)**	**22.0**

ASTRA-3A - Telemetry		
downlink EIRP	(dBW)	6.3
Hypothetical satellite		
Downlink EIRP (EOC)	(dBW)	6.3
Receive earth station size	(m)	9.2
Receive earth station gain	(dBi)	58.5
Receive earth station off-axis	(dBi)	21.0
Required C/I	(dB)	15.0
Interference analysis		
Calculated C/I (single satellite)	(dB)	37.5
Calculated C/I (two satellites)	(dB)	34.5
Margin	(dB)	**19.5**

5. Compliance with PFD limits in 11.45-11.7 GHz

The allowable PFD levels in the 11.45-11.70 GHz bands (per 4kHz) are defined in Section 25.208(b)(1) of the Commission's rules for all conditions, including clear sky, and for all methods of modulation as:

1. For angles of arrival between 0 and 5 degrees above the horizontal plane: -150 dBW/m2 in any 4 kHz band;
2. For angles of arrival δ (in degrees) between 5 and 25 degrees above the horizontal plane: -150 + (δ-5)/2 dBW/m2 in any 4 kHz band; and
3. For angles of arrival between 25 and 90 degrees above the horizontal plane: -140 dBW/m2 in any 4 kHz band.

In order to demonstrate such compliance, the PFD levels for the telemetry carriers, based on the link budgets set forth in Section 3, are calculated below. It can be seen from the results that compliance with the PFD levels has been achieved.

PFD level compliance calculation					
Angle of Arrival	**Applicable PDF limit**	**Spreading Loss**	**Gain Contour**	**Worst case PFD**	**PFD Margin**
0	-150.0	-163.4	-0.2	-172.0	22.0
5	-150.0	-163.3	-0.1	-171.8	21.8
10	-147.5	-163.2	-0.1	-171.7	24.2
15	-145.0	-163.0	0.0	-171.4	26.4
20	-142.5	-162.9	0.0	-171.3	28.8
25	-140.0	-162.8	0.0	-171.2	31.2
Peak (90)	-140.0	-162.1	0.0	-170.5	30.5

6. TT&C Contour Maps

Figures 1 and 2 below show the contour maps for the Telecommand and Telemetry antennas, respectively. The gain patterns of these torroidal antennas are very flat over the Earth's surface, as they were only specified to have a 2 dB rolloff at 35 degrees elevation offset. The variation of the gain of the antenna only gives about a 0.1 dB expected variation over the +/- 8.7 degree

subtended angle of the earth. The peak gain is -4.4 dBi for the Telecommand receive antenna and -3.8 dBi for the Telemetry antenna. For these reasons additional gain contours, as requested in Section 25.114(d)(3), are not provided because they do not intersect with the Earth's surface.

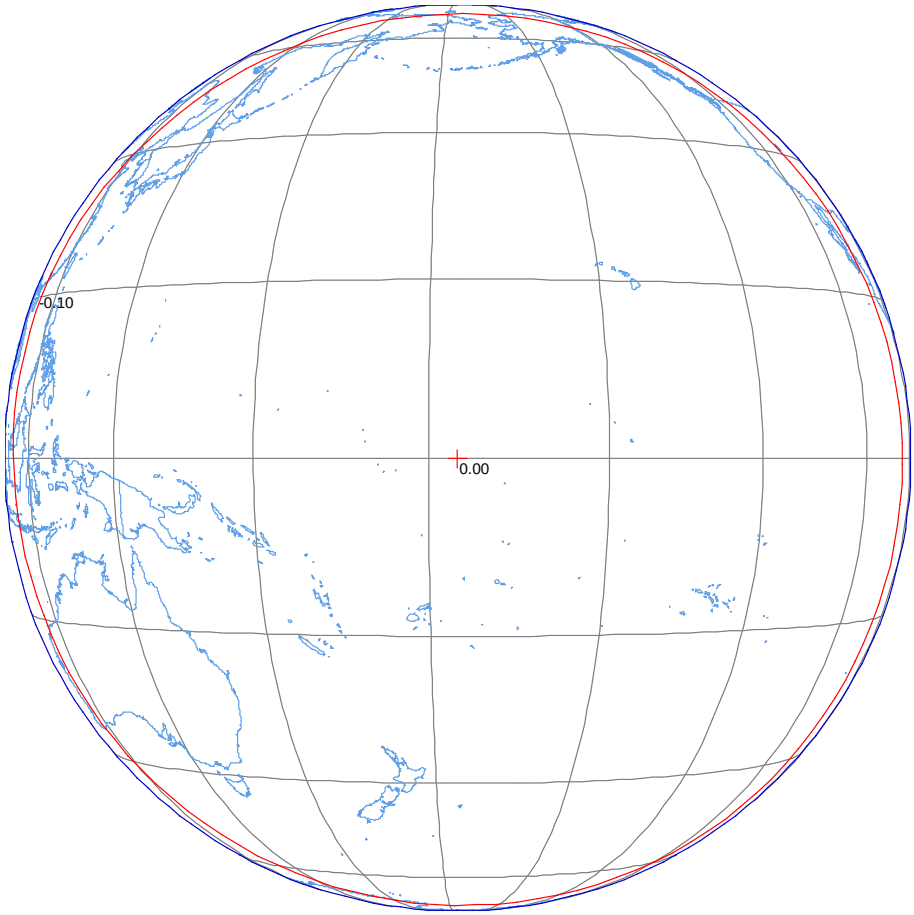

Figure 1.
Command Carrier Receive Omni
Maximum receive gain = -4.4 dBi
Polarization Vertical Linear

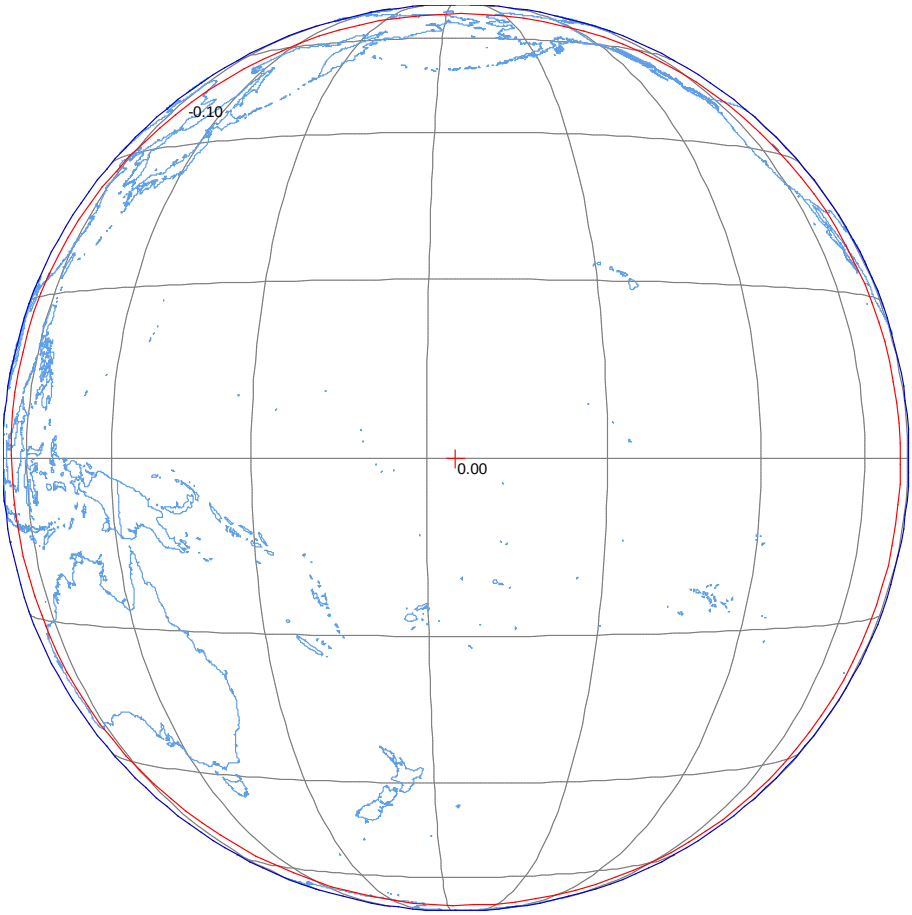

Figure 2.
Telemetry Carrier Transmit Omni
Maximum transmit gain = -3.8 dBi
Polarization Horizontal Linear

Attachment 2: ASTRA 3A at 176.85° W.L.

1. Orbital Location

176.85° W.L. +/- 0.10° east/west stationkeeping tolerance

2. Inclination

The ASTRA 3A satellite is in inclined orbit. As of 17 July 2013, the inclination of ASTRA 3A was 1.01º. Upon arrival at 176.85° W.L., the inclination of the satellite is expected to be 1.33°. The inclination of the satellite is expected to continue increasing by approximately 0.8 degrees per year.

3. Service Frequencies

14.0-14.5 GHz (Earth-to-space)
11.45-11.7 GHz (space-to-Earth)
12.5-12.75 GHz (space-to-Earth)

4. Proposed Service Area

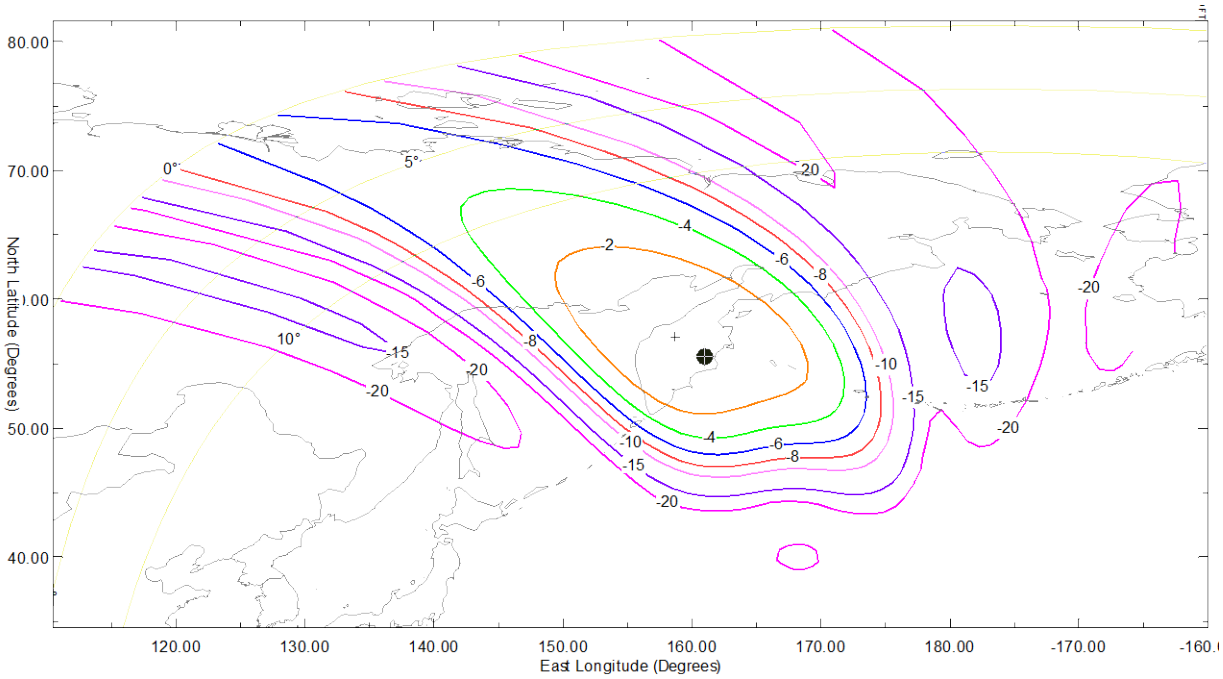

Figure 3.
ASTRA-3A communications antenna downlink (transmit) contour maps
(peak eirp : 56.1 dBW)

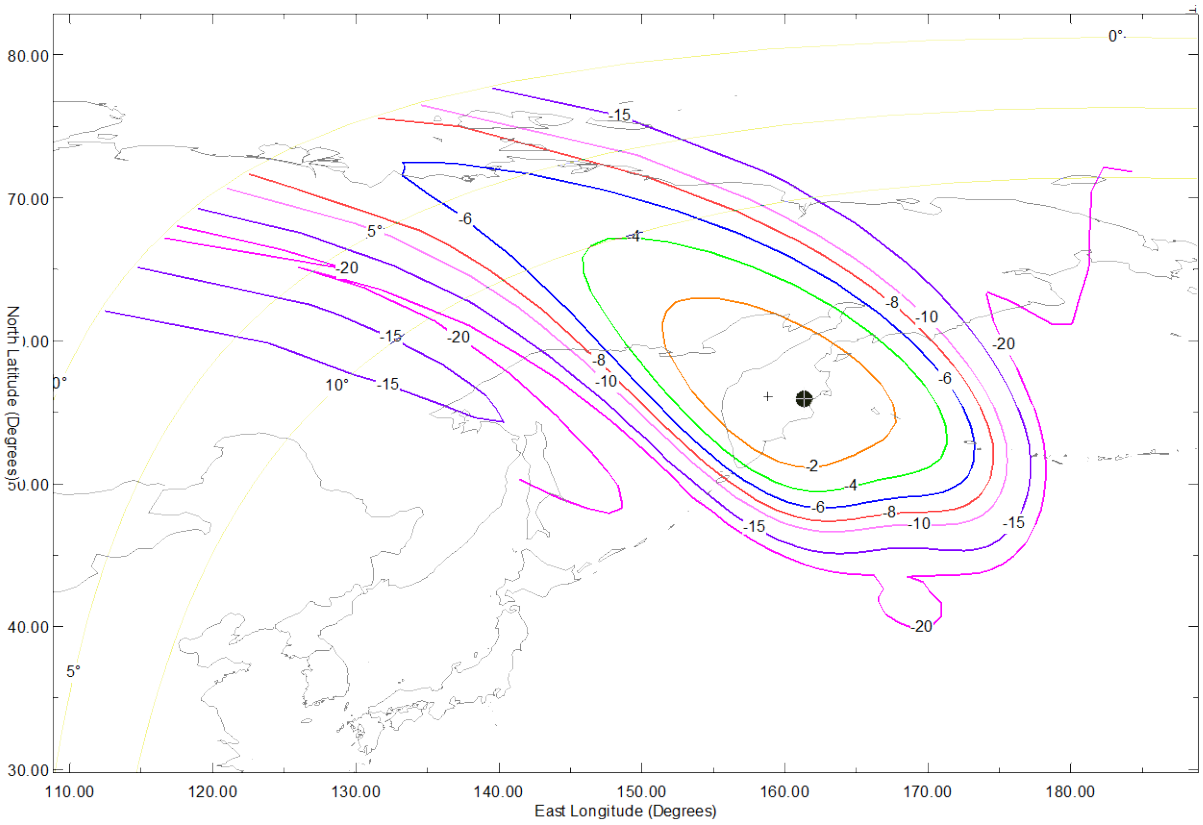

Figure 4.
ASTRA-3A communications antenna uplink (receive) contour maps
(peak G/T : 15.8 dB/K)

5. Protection of Region 2 BSS in 12.5-12.75 GHz

The frequency band 12.50-12.75 GHz is allocated to unplanned FSS over ITU Region 1 (and thus the territory of the Russian Federation). At the same time, this band is allocated to BSS (Appendix 30B) over ITU Region 2. The pointing of the communications antenna of the ASTRA 3A spacecraft has been selected so as to optimize coverage of the proposed service area in the territory of the Russian Federation, while minimizing the power over any Region 2 territory (and hence any U.S. territory).

It can be seen from Figure 2 above that the EIRP over U.S. territory (Alaska in particular) will be at least 20 dB below the peak EIRP of the beam.

The closest U.S. national allotment to the 176.85W orbital position is the ALS00003 allotment at 175.2W. According to the information available at the time of this submission, there is no known satellite operating at this orbital location in the band 12.50-12.75 GHz, so there is therefore no potential for any harmful interference. However, if the FCC were to authorize a BSS satellite to operate from the 175.2W orbital location under the ALS00003 allotment, SES

would commit to operate on a non-harmful interference basis pending completion of coordination.

Attachment 3: Orbital Debris Mitigation Statement

1 Spacecraft Hardware Design

SES has assessed and limited the amount of debris released in a planned manner during normal operations of ASTRA 3A. The ASTRA 3A satellite was built on the proven Boeing 376HP bus and was launched in March 2002. No debris is generated during normal on-station operations, and the spacecraft will be in a stable configuration.

SES has also assessed and limited the probability of the space station becoming a source of orbital debris by collisions with small debris or meteoroids that could cause loss of control and prevent post-mission disposal. The design of SES's recent spacecraft locates all sources of stored energy within the body of the structure, which provides protection from small orbital debris. SES requires that spacecraft manufacturers assess the probability of micrometeorite damage that can cause any loss of functionality. This probability is then factored into the ultimate spacecraft probability of success. Any significant probability of damage would need to be mitigated in order for the spacecraft design to meet SES's required probability of success of the mission. SES has taken the following steps to limit the effects of such collisions: (1) critical spacecraft components are located inside the protective body of the spacecraft and properly shielded; and (2) all spacecraft subsystems have redundant components to ensure no single-point failures. The spacecraft will not use any subsystems for end-of-life disposal that are not used for normal operations.

2 Minimizing Accidental Explosions

SES has assessed and limited the probability of accidental explosions during and after completion of mission operations. As part of the Safety Data Package submission for SES spacecraft, an extensive analysis is completed by the spacecraft manufacturer, reviewing each potential hazard relating to accidental explosions. A matrix is generated indicating the worst-case effect, the hazard cause, and the hazard controls available to minimize the severity and the probability of occurrence. Each subsystem is analyzed for potential hazards, and the Safety Design Package is provided for each phase of the program running from design phase,

qualification, manufacturing and operational phase of the spacecraft. Also, the spacecraft manufacturer generates a Failure Mode Effects and Criticality Analysis for the spacecraft to identify all potential mission failures. The risk of accidental explosion is included as part of this analysis. This analysis indicates failure modes, possible causes, methods of detection, and compensating features of the spacecraft design.

The design of the ASTRA 3A spacecraft is such that the risk of explosion is minimized both during and after mission operations. In designing and building the spacecraft, the manufacturer took steps to ensure that debris generation will not result from the conversion of energy sources on board the satellite into energy that fragments the satellite. All propulsion subsystem pressure vessels, which have high margins of safety at launch, have even higher margins in orbit, since use of propellants and pressurants during launch decreases the propulsion system pressure. Burst tests are performed on all pressure vessels during qualification testing to demonstrate a margin of safety against burst. Bipropellant mixing is prevented by complete isolation of propellant species from each other. Pressures, including a subset of the batteries, will be monitored by telemetry.

At the end of operational life, after the satellite has reached its final disposal orbit, all on-board sources of stored energy will be depleted or secured, excess propellant remaining in the chemical propulsion tanks will be vented, and the batteries will be discharged.

3 Safe Flight Profiles

SES has assessed and limited the probability of the space station becoming a source of debris by collisions with large debris or other operational space stations. Specifically, SES has assessed the possibility of collision with satellites located at, or reasonably expected to be located at, the requested orbital location or assigned in the vicinity of that location. Regarding avoidance of collisions with controlled objects, in general, if a geosynchronous satellite is controlled within its specified longitude and latitude station-keeping limits, collision with another controlled object (excluding where the satellite is collocated with another object) is the direct result of that object entering the allocated space.

ASTRA 3A will be positioned at 176.85° W.L., immediately adjacent to the NSS-9 spacecraft, at the nominal 177° W.L. orbital location. In considering current and planned satellites that may have a station-keeping volume that overlaps the ASTRA 3A satellite, SES has reviewed the FCC databases for FCC licensed satellite networks and those that are currently under consideration by the FCC. In addition, networks for which a request for coordination has been published by the ITU within ±0.15 degrees of 176.85° W.L. have also been reviewed. Only those networks that either operate, or are planned to operate, and have an overlapping station-keeping volume with the ASTRA 3Asatellite, have been taken into account in the analysis.

Based on these reviews, the only satellite operating near 176.85° W.L. is NSS-9, which is also controlled and operated by SES. SES is not aware of any aware of any pending applications before the Commission requesting authorization to use an orbital location within ±0.15° of 176.85° W.L., and within this sub-arc, SES is not aware any proposals by any other administration to launch or deploy a satellite to such locations in the near term.

Based on the preceding, it is concluded that physical coordination of the ASTRA 3A satellite with another party is not required at the present time.

On-station station-keeping operations will be within the +/- 0.10 degree E-W control box with no inclination control, thereby ensuring adequate collision avoidance distance from other satellites in geosynchronous orbit.

SES uses the Space Data Center ("SDC") system from the Space Data Association to monitor the risk of close approach of its satellites with other objects. Any close encounters (separation of less than 10 km) are flagged and investigated in more detail. If required, avoidance maneuvers are performed to eliminate the possibility of collisions. During any relocation, the moving spacecraft is maneuvered such that it is at least 30 km away from the synchronous radius at all times. In most cases, much larger deviation from the synchronous radius is used. In addition, the SDC system is used to ensure no close encounter occurs during the move. When de-orbit of a spacecraft is required, the initial phase is treated as a satellite move, and the same precautions are used to ensure collision avoidance.

4 Post-Mission Disposal Plan

Post-mission disposal of the satellite from operational orbit will be accomplished by carrying out maneuvers to a higher orbit. The upper stage engine remains part of the satellite, and there is no re-entry phase for either component. The fuel budget for elevating the satellite to a disposal orbit is included in the satellite design. SES plans to maneuver ASTRA 3A to a disposal orbit with a minimum perigee of 259.4 km above the normal GSO operational orbit. This proposed disposal orbit altitude results from application of the IADC formula based on the following calculation:

Total Solar Pressure Area "A" = 13 m^2

"M" = Dry Mass of Satellite = 671.8 kg

"C_R" = Solar Pressure Radiation Coefficient = 1.26

Therefore the Minimum Disposal Orbit Perigee Altitude:

= 36,021 km + 1000 x C_R x A/m

= 36,021 km + 1000 x 1.26 x 13 / 671.8

= 36,045.4 km

= 259.4 km above GSO (35,786 km)

SES intends to reserve 6.5 kg of propellant in order to account for post-mission disposal of ASTRA 3A. SES has assessed fuel-gauging uncertainty and has provided an adequate margin of fuel reserve to address the assessed uncertainty.