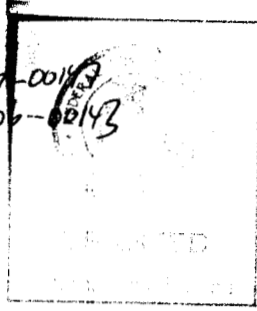


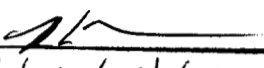
See also: SAT-AMD-20050714-00143
SAT-PPL-20050706-00143



File # SAT-AMD-20051118-00222
with attached conditions

Grant # 52677 Grant Date 3/29/2006
(Grant Identifier)

Term Dates
From: SEC Conditions To: SEC Conditions

Approved:  Chief
Robert B. Neff Satellite Division

Approved by OMB
3060-0678

Date & Time Filed: Nov 18 2005 10:15:05:596AM
File Number: SAT-AMD-20051118-00222

FCC APPLICATION FOR SPACE AND EARTH STATION:MOD OR AMD - MAIN FORM	FCC Use Only
FCC 312 MAIN FORM FOR OFFICIAL USE ONLY	

APPLICANT INFORMATION

Enter a description of this application to identify it on the main menu:
Amendment to Incorporate an Amended Orbital Debris Mitigation Plan into Petition for Declaratory Ruling for Star One C1

1-8. Legal Name of Applicant			
Name:	Star One S.A.	Phone Number:	552121219126
DBA Name:		Fax Number:	552121219321
Street:	Praia de Botafogo 228, 3o. and Rio de Janeiro	E-Mail:	lprates@starone.com.br
City:		State:	
Country:	Brazil	Zipcode:	-
Attention:	Mr Luiz Prates		

ATTACHMENT
SAT-PPL-20050706-00143, SAT-AMD-20050714-00147, SAT-AMD-20051118-00222
Conditions of Permitted Space Station List Grant
March 29, 2006

Pursuant to Sections 303(r), 308, 309, and 310 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 303(r), 308, 309, 310, and Sections 0.261 and 25.137(c) of the Commission's rules, 47 C.F.R. §§ 0.261, 25.137(c), the Petition for Declaratory Ruling filed by Star One SA (File No. SAT-PPL-20050706-00143, as amended by SAT-AMD-20050714-00147¹ and SAT-AMD-20051118-00222²) to add the hybrid C and Ku-band Star One C1 satellite (Call Sign S2677) located at the 65° W.L. orbital location, which is licensed by Brazil, to the Commission's Permitted Space Station List is GRANTED. Accordingly, each U.S.-licensed earth station with "ALSAT" designated as a point of communication, IS GRANTED authority to provide Fixed Satellite Services (FSS) in the 14000-14500 GHz (Earth-to-space), 11700-12200 GHz (space-to-Earth), 5925-6425 MHz (Earth-to-space) and 3700-4200 MHz (space-to-Earth) frequency bands, to, from, or within the United States, by accessing the Star One C1 satellite (Call Sign S2677) at the 65° W.L. orbital location, in accordance with the technical specifications set forth in its petition for declaratory ruling, this Attachment, and the Commission's Rules and subject to the following conditions:

- a) Star One C1 is not authorized to provide any Direct-to-Home (DTH) service, Direct Broadcast Satellite (DBS) service, or Digital Audio Radio Service (DARS) to, from, or within the United States;
- b) Communications between ALSAT-designated routine earth stations and the Star One C1 satellite shall be in compliance with the satellite coordination agreements reached between Brazil and other administrations;
- c) Star One's request for waiver of Section 25.210(a)(3), 47 C.F.R. 25.210(a)(3), of the Commission's rules is GRANTED as conditioned. Section 25.210(a)(3) requires that all space stations in the FSS used for domestic service in the C-band shall be capable of switching polarity upon ground command. This provision is required for two reasons: to permit U.S.-licensed satellites the flexibility to be assigned to different U.S. orbital positions and to mitigate potential interference between adjacent FSS systems transmitting analog TV signals. The transmission polarization of the C-band payload of the Star One C1 satellite cannot be reversed from the ground. Star One indicates that it has not completed international coordination of the Star One C1 with the operators of the adjacent satellites serving the U.S. market. Thus, as a condition of this waiver, Star One is prohibited from transmitting or receiving analog TV signals to, from or within the

¹ Star One Supplement to Petition for Declaratory Ruling to Add Star One C1 at 65° W.L. to the permitted list, filed July 14, 2005. This supplement requests a waiver of the full frequency reuse requirement of Section 25.210(f), 47 C.F.R. § 25.210(f).

² Star One Amendment to Incorporate an Amended Orbital Debris Mitigation Plan into Petition for Declaratory Ruling for Star One C1, filed November 18, 2005.

United States until such time as it has completed coordination. Further, Star One must accommodate future satellite networks serving the United States that are two-degree compliant. Grant of this waiver request is consistent with our precedent;³

d) Star One's request for waiver of Section 25.210(i), 47 C.F.R. § 25.210(i) of the Commission's rules IS GRANTED as conditioned. Section 25.210(i) directs, "Space station antennas in the Fixed-Satellite Service must be designed to provide a cross-polarization isolation such that the ratio of the on axis co-polar gain to the crosspolar gain of the antenna in the assigned frequency band shall be at least 30 dB within its primary coverage area." Star One indicates although the cross-polarization isolation of the Star One C1 satellite's antennas will comply with 30 dB minimum isolation over 80% the coverage area, the isolation of the C-Band BSC antenna may be as low as 27 dB and the Ku-Band MK antenna may be as low as 28 dB in the remaining 20% of the coverage area (typically at edge of coverage). The shortfall will not produce a significant increase in interference, except to Star One C1. Further, Star One must accommodate future satellite networks serving the United States that are two-degree compliant. Grant of this waiver request is consistent with our precedent.⁴

e) Star One's request for waiver of sections 25.211(a) and (b), 47 C.F.R. §§ 25.211(a) and (b) IS GRANTED as conditioned. Section 25.211(a) requires C-band analog video transmissions to occur at specific center frequencies and Section 25.211(b) requires carrier frequencies for Ku-band TV/FM transmissions to be identified for coordination with adjacent U.S. satellite systems and affected satellite systems of other administrations. Star One states that it has not completed coordination with all potentially affected U.S. satellite operators and thus it is not certain what center frequencies may be used for C-band and Ku-band FM/TV transmissions. Star One has agreed to provide such information after completion of the coordination with potentially affected U.S. satellite operators and request any necessary waivers at that time. Under these circumstances, we find that Star One's failure to identify the center frequencies to be used for C-band and Ku-band FM/TV transmissions does not preclude grant of the petition for declaratory ruling in this instance as we have already precluded this type of transmission. Specifically, as noted above as a condition of inclusion on the Permitted List, U.S. licensed earth stations are prohibited from transmitting or receiving FM/TV transmissions from television signals from the satellite. In addition to the points discussed above, this condition will only be lifted upon the filing of a modification request that demonstrates compliance with the Commission's rules, including section 25.211(a) and (b).

³ See Mabuhay Philippines Satellite Corp. Petition for Declaratory Ruling, Application of Loral CyberStar, Inc. for Authority to Operate Two Transmit/Receive Earth Stations at Kapolei, Hawaii, for Use in Conjunction with the Mabuhay Satellite Located at 146 E.L., *Order and Authorization*, 15 FCC Rcd 23671, 23676 para. 13 (2000) (granting a waiver of section 25.210(a)(3) and imposing the same condition imposed here).

⁴ Star One S.A.; Petition for Declaratory Ruling to Add The Star One C1 Satellite at 65° W.L. to the Permitted Space Station List, *Order*, 19 FCC Rcd 16334 (Sat. Div. 2004) (finding that the impact on neighboring satellite systems of a 3-5 dB difference from the required cross polarization isolation ratio would be negligible).

f) Star One's request for waiver of the frequency reuse requirement of section 25.210(f), 47 C.F.R. § 25.210(f), with respect to the Ku-band payload⁵ IS GRANTED as conditioned. Section 25.210(f) requires all FSS space stations to employ state-of-the-art full frequency reuse either through the use of orthogonal polarizations within the same beam and/or the use of spatially independent beams. The full-frequency reuse requirements were designed to ensure that satellites maximized the use of their transponder capacity to the benefit of the public.⁶ The Commission has waived these requirements where, as in the case of Star One C1 at 65° W.L., doing so would allow satellite capacity that would otherwise lay dormant to be used to provide service as long as such use does not preclude a state-of-the-art satellite from operating at this location.⁷ Grant of this waiver request is consistent with our precedent.⁸

g) Unless extended by the Commission for good cause shown, Star One C1 shall be removed from the Permitted Space Station List in the event the space station is not constructed, launched, and successfully placed into operation in accordance with the technical parameters in its Petition for Declaratory Ruling and the terms and conditions of this grant, by the following dates:

Launch: March 29, 2008

Star One S. A. must file a bond with the Commission in the amount of \$750,000 pursuant to the procedures set forth in Public Notice, DA 03-602, 18 FCC Rcd 16283 (2003), no later than April 29, 2006.⁹

h) This action is taken pursuant to Section 0.261 of the Commission's rules on delegated authority, 47 C.F.R. § 0.261, and is effective upon adoption. Petitions for reconsideration under Section 1.106 or applications for review under Section 1.115 of the Commission's

⁵ Star One S.A.; Petition for Declaratory Ruling to Add The Star One C1 Satellite at 65° W.L. to the Permitted Space Station List, Supplement to Petition for Declaratory Ruling, IBFS No. SAT-AMD-20050714-00147.

⁶ *Licensing of Space Stations in the Domestic Fixed-Satellite Service and Related Revisions of Part 25 of the Rules and Regulations*, Report and Order, CC Docket No. 81-704, 54 RR 2d 577, 598 (para. 70) (1983) (*Two-Degree Spacing Order*). See also *Systematics General Corporation*, Memorandum Opinion and Order, 103 FCC 2d 879, 881 (para. 6) (1985) (*1985 Systematics Order*).

⁷ See, e.g., *1987 Systematics Order*, 2 FCC Rcd 7550 (authorizing the TDRS-1 and TDRS-3 satellites, which did not meeting the full frequency reuse requirement, to provide service from the 41° W.L. and 62° W.L. orbit locations until those locations were ready to be occupied by compliant satellites). See also *Columbia Communications Corporation*, Memorandum Opinion, Order, and Authorization, 7 FCC Rcd 122, 123 (para. 15) (1991) (*Columbia Full Frequency Reuse Waiver Order*).

⁸ See *Columbia Full Frequency Reuse Waiver Order*, 7 FCC Rcd at 123 (para. 15).

⁹ As part of grant of the Petition for Declaratory ruling, we find that Star One has met the milestones for Contract Execution, Critical Design Review, and Commence Construction. Accordingly, we only impose one milestone with an accordingly shortened schedule. Star One's request for waiver of the first three milestones and a partial waiver of the requirement to post a \$3 million bond pursuant to Sections 25.137, 25.164 and 25.165 of the Commission's rules is dismissed as moot.

rules, 47 C.F.R. §§ 1.106, 1.115, may be filed within 30 days of the date of the public notice indicating that this action was taken.

9-16. Name of Contact Representative

Name:	Alfred Mamlet	Phone Number:	202-429-3000
Company:	Step toe & Johnson LLP	Fax Number:	202-429-3902
Street:	1330 Connecticut Avenue, NW	E-Mail:	amamlet@step toe.com
City:	Washington	State:	DC
Country:	USA	Zipcode:	20035-1795
Attention:		Relationship:	Legal Counsel

CLASSIFICATION OF FILING

17. Choose the button next to the classification that applies to this filing for both questions a. and b. Choose only one for 17a and only one for 17b.

- a1. Earth Station
- a2. Space Station

- (N/A) b1. Application for License of New Station
- (N/A) b2. Application for Registration of New Domestic Receive-Only Station
- (N/A) b3. Amendment to a Pending Application
- (N/A) b4. Modification of License or Registration
- b5. Assignment of License or Registration
- b6. Transfer of Control of License or Registration
- (N/A) b7. Notification of Minor Modification
- (N/A) b8. Application for License of New Receive-Only Station Using Non-U.S. Licensed Satellite
- (N/A) b9. Letter of Intent to Use Non-U.S. Licensed Satellite to Provide Service in the United States
- (N/A) b10. Other (Please specify)

<p>17c. Is a fee submitted with this application?</p> <p><input type="radio"/> If Yes, complete and attach FCC Form 159. If No, indicate reason for fee exemption (see 47 C.F.R.Section 1.1114).</p> <p><input type="radio"/> Governmental Entity <input type="radio"/> Noncommercial educational licensee</p> <p><input checked="" type="radio"/> Other(<i>please explain</i>): This amendment is made pursuant to the FCC's new orbital debris mitigation rules and does not require a fee per the FCC's Public Notice (DA 05-2698).</p>	
<p>17d.</p> <p>Fee Classification CWY – Space Station Amendment(Geostationary)</p>	
<p>18. If this filing is in reference to an existing station, enter:</p> <p>(a) Call sign of station: S2677</p>	<p>19. If this filing is an amendment to a pending application enter both fields, if this filing is a modification please enter only the file number:</p> <p>(a) Date pending application was filed: 07/06/2005</p> <p>(b) File number: SATPPL2005070600143</p>

TYPE OF SERVICE

<p>20. NATURE OF SERVICE: This filing is for an authorization to provide or use the following type(s) of service(s): Select all that apply:</p> <p><input checked="" type="checkbox"/> a. Fixed Satellite</p> <p><input type="checkbox"/> b. Mobile Satellite</p> <p><input type="checkbox"/> c. Radiodetermination Satellite</p> <p><input type="checkbox"/> d. Earth Exploration Satellite</p> <p><input type="checkbox"/> e. Direct to Home Fixed Satellite</p> <p><input type="checkbox"/> f. Digital Audio Radio Service</p> <p><input type="checkbox"/> g. Other (please specify)</p>	
<p>21. STATUS: Choose the button next to the applicable status. Choose only one.</p> <p><input type="radio"/> Common Carrier <input checked="" type="radio"/> Non-Common Carrier</p>	<p>22. If earth station applicant, check all that apply.</p> <p><input type="checkbox"/> Using U.S. licensed satellites</p> <p><input type="checkbox"/> Using Non-U.S. licensed satellites</p>
<p>23. If applicant is providing INTERNATIONAL COMMON CARRIER service, see instructions regarding Sec. 214 filings. Choose one. Are these facilities:</p> <p><input type="radio"/> Connected to a Public Switched Network <input type="radio"/> Not connected to a Public Switched Network <input checked="" type="radio"/> N/A</p>	
<p>24. FREQUENCY BAND(S): Place an 'X' in the box(es) next to all applicable frequency band(s).</p> <p><input checked="" type="checkbox"/> a. C-Band (4/6 GHz) <input checked="" type="checkbox"/> b. Ku-Band (12/14 GHz)</p> <p><input type="checkbox"/> c. Other (Please specify upper and lower frequencies in MHz.)</p> <p>Frequency Lower: Frequency Upper: (Please specify additional frequencies in an attachment)</p>	

TYPE OF STATION

<p>25. CLASS OF STATION: Choose the button next to the class of station that applies. Choose only one.</p> <p><input type="radio"/> a. Fixed Earth Station</p> <p><input type="radio"/> b. Temporary-Fixed Earth Station</p> <p><input type="radio"/> c. 12/14 GHz VSAT Network</p> <p><input type="radio"/> d. Mobile Earth Station</p> <p><input type="radio"/> e. Geostationary Space Station</p> <p><input type="radio"/> f. Non-Geostationary Space Station</p> <p><input checked="" type="radio"/> g. Other (please specify) Petition for Declaratory Ruling</p>
<p>26. TYPE OF EARTH STATION FACILITY:</p> <p><input type="radio"/> Transmit/Receive <input type="radio"/> Transmit-Only <input type="radio"/> Receive-Only <input checked="" type="radio"/> N/A</p> <p>"For Space Station applications, select N/A."</p>

PURPOSE OF MODIFICATION

27. The purpose of this proposed modification is to: (Place an 'X' in the box(es) next to all that apply.)

- a -- authorization to add new emission designator and related service
- b -- authorization to change emission designator and related service
- c -- authorization to increase EIRP and EIRP density
- d -- authorization to replace antenna
- e -- authorization to add antenna
- f -- authorization to relocate fixed station
- g -- authorization to change frequency(ies)
- h -- authorization to add frequency
- i -- authorization to add Points of Communication (satellites & countries)
- j -- authorization to change Points of Communication (satellites & countries)
- k -- authorization for facilities for which environmental assessment and radiation hazard reporting is required
- l -- authorization to change orbit location
- m -- authorization to perform fleet management
- n -- authorization to extend milestones
- o -- Other (Please specify)

ENVIRONMENTAL POLICY

28. Would a Commission grant of any proposal in this application or amendment have a significant environmental impact as defined by 47 CFR 1.1307? If YES, submit the statement as required by Sections 1.1308 and 1.1311 of the Commission's rules, 47 C.F.R. 1.1308 and 1.1311, as an exhibit to this application. A Radiation Hazard Study must accompany all applications for new transmitting facilities, major modifications, or major amendments.	<input type="radio"/> Yes <input checked="" type="radio"/> No
--	---

ALIEN OWNERSHIP Earth station applicants not proposing to provide broadcast, common carrier, aeronautical en route or aeronautical fixed radio station services are not required to respond to Items 30–34.

29. Is the applicant a foreign government or the representative of any foreign government?	<input type="radio"/> Yes <input checked="" type="radio"/> No
30. Is the applicant an alien or the representative of an alien?	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A
31. Is the applicant a corporation organized under the laws of any foreign government?	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A
32. Is the applicant a corporation of which more than one-fifth of the capital stock is owned of record or voted by aliens or their representatives or by a foreign government or representative thereof or by any corporation organized under the laws of a foreign country?	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A

33. Is the applicant a corporation directly or indirectly controlled by any other corporation of which more than one-fourth of the capital stock is owned of record or voted by aliens, their representatives, or by a foreign government or representative thereof or by any corporation organized under the laws of a foreign country? Yes No N/A

34. If any answer to questions 29, 30, 31, 32 and/or 33 is Yes, attach as an exhibit an identification of the aliens or foreign entities, their nationality, their relationship to the applicant, and the percentage of stock they own or vote. Questions 34 and 40

BASIC QUALIFICATIONS

35. Does the Applicant request any waivers or exemptions from any of the Commission's Rules? Yes No
If Yes, attach as an exhibit, copies of the requests for waivers or exceptions with supporting documents.

36. Has the applicant or any party to this application or amendment had any FCC station authorization or license revoked or had any application for an initial, modification or renewal of FCC station authorization, license, or construction permit denied by the Commission? If Yes, attach as an exhibit, an explanation of circumstances. Yes No

<p>37. Has the applicant, or any party to this application or amendment, or any party directly or indirectly controlling the applicant ever been convicted of a felony by any state or federal court? If Yes, attach as an exhibit, an explanation of circumstances.</p>	<p><input type="radio"/> Yes <input checked="" type="radio"/> No</p>
<p>38. Has any court finally adjudged the applicant, or any person directly or indirectly controlling the applicant, guilty of unlawfully monopolizing or attempting unlawfully to monopolize radio communication, directly or indirectly, through control of manufacture or sale of radio apparatus, exclusive traffic arrangement or any other means or unfair methods of competition? If Yes, attach as an exhibit, an explanation of circumstances</p>	<p><input type="radio"/> Yes <input checked="" type="radio"/> No</p>
<p>39. Is the applicant, or any person directly or indirectly controlling the applicant, currently a party in any pending matter referred to in the preceding two items? If yes, attach as an exhibit, an explanation of the circumstances.</p>	<p><input type="radio"/> Yes <input checked="" type="radio"/> No</p>
<p>40. If the applicant is a corporation and is applying for a space station license, attach as an exhibit the names, address, and citizenship of those stockholders owning a record and/or voting 10 percent or more of the Filer's voting stock and the percentages so held. In the case of fiduciary control, indicate the beneficiary(ies) or class of beneficiaries. Also list the names and addresses of the officers and directors of the Filer.</p>	

41. 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

42a. Does the applicant intend to use a non-U.S. licensed satellite to provide service in the United States? If Yes, answer 42b and attach an exhibit providing the information specified in 47 C.F.R. 25.137, as appropriate. If No, proceed to question 43. Yes No

42b. What administration has licensed or is in the process of licensing the space station? If no license will be issued, what administration has coordinated or is in the process of coordinating the space station? Brazil

43. Description. (Summarize the nature of the application and the services to be provided). (If the complete description does not appear in this box, please go to the end of the form to view it in its entirety.)

Star One S.A. amends its Petition for Declaratory Ruling to include an updated orbital debris mitigation plan pursuant to the Commission's Public Notice of October 13, 2005. All other information contained in the Petition remains materially unchanged.

Mitigation Plan

CERTIFICATION

The Applicant waives any claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise, and requests an authorization in accordance with this application. The applicant certifies that grant of this application would not cause the applicant to be in violation of the spectrum aggregation limit in 47 CFR Part 20. All statements made in exhibits are a material part hereof and are incorporated herein as if set out in full in this application. The undersigned, individually and for the applicant, hereby certifies that all statements made in this application and in all attached exhibits are true, complete and correct to the best of his or her knowledge and belief, and are made in good faith.

44. Applicant is a (an): (Choose the button next to applicable response.)

- Individual
- Unincorporated Association
- Partnership
- Corporation
- Governmental Entity
- Other (please specify)

45. Name of Person Signing
Luiz Otavio Vasconcelos Prates

46. Title of Person Signing
Director of External Affairs

→

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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THE FOREGOING NOTICE IS REQUIRED BY THE PAPERWORK REDUCTION ACT OF 1995, PUBLIC LAW 104-13, OCTOBER 1, 1995, 44 U.S.C. SECTION 3507.

**STAR ONE S.A. OWNERSHIP AND
OFFICERS AND DIRECTORS**

Star One S.A. Ownership:

Star One S.A. is 80.01% owned by Empresa Brasileira de Telecomunicações S.A. ("Embratel") and 19.99% owned by Société Européenne des Satellites S.A. ("SES"). The address of Embratel is Av. Presidente Vargas 1012, 20179-900 - Rio de Janeiro, Brazil. The address of SES is L-6815 Chateau de Betzdorf, Luxembourg.

Embratel is 99% owned by Embratel Participações S/A, a Brazilian company that is publicly traded in Brazil and the United States. The remaining 1% of Embratel is widely held by pension funds, institutions and individuals, many of who are not U.S. nationals. Telmex ("Telmex"), through its Brazilian subsidiaries Startel, Telmex Solutions, Both located at Rua Regente Feijó, 166, 16 andar, sala 1678-C, Rio de Janeiro, Brazil, and New Startel located at Av. Presidente Vargas, 1012, 20179-900, Rio de Janeiro, Brazil, and through an U.S. subsidiary Latam Telecomunicaciones LLC located at 1105 North Market Street, suite 1300, Wilmington, Delaware, 19801, owns 97.33% of the voting shares (and 72.04% of the total stock) of Embratel Participações S/A. No other shareholders hold more than 10% of the voting stock of Embratel Participações S/A.

SES is a wholly-owned subsidiary of SES Global S.A. ("SES Global"). The address of SES Global is L-6815 Chateau de Betzdorf, Luxembourg. The shareholders of a 10% or greater interest in SES Global include: (i) GE Electric Capital Corporation, a New York Corporation located at 260 Long Ridge Road, Stamford, CT 06927, holds shares representing a 30.73% economic interest and 20.10% voting interest in of SES Global; (ii) Deutsche Telekom, A.G., a German corporation located at Friedrich-Ebert-Allee 140, 53115 Bonn, Germany, holds shares representing a 13.15% economic interest and 10.35% voting interest in of SES Global; and (iii) the State of Luxembourg and Bank et Caisse d'Epargne de l'Etat ("BCEE") and the Société Nationale de Crédit et d'Investissement ("SNCF"), Luxembourg banking companies 100% owned by the State of Luxembourg and located at 1, place de Metz, L-2954 Luxembourg and 7, place du St. Esprit, L-1475 Luxembourg, respectively, together hold shares representing a 16.67% economic interest and 34.90% voting interest in of SES Global.

Star One S.A. Officers and Directors:

Officers (including title and nationality):

Edson Soffiatti- Chief Executive Officer (Brazil) (*)
Ana Beatriz Gorini - Chief Administrative and Financial Officer (Brazil)
Ricardo Cesar de Campos Cruz - Chief Broadband Officer (Brazil) (*)
Lincoln Amazonas Antunes de Oliveira - Chief Engineering Officer (Brazil)(*)
Mauro Wajnberg - Chief Space Segment Business Officer (Brazil)
Luiz Otavio Vasconcelos Prates - Chief External Affairs Officer (Brazil)
Francisco Carlos Perrota - Chief Sales and Marketing Officer (Brazil)
Andre Santos Correia - General Legal Counsel (Brazil)
Luis Fernando De Aguillar Pinho - Chief Operations Officer (Brazil)

Directors (including nationality):

Carlos Henrique Moreira - Chairman (Brazil)
José Formoso Martínez (Mexico)
Alberto de Orleans e Bragança (Brazil)
Dilio Sergio Penedo (Brazil)
Antônio Oscar de Carvalho Petersen Filho (Brazil)
Ivan Campagnolli Junior (Brazil)
Edson Soffiatti (Brazil)
Isaac Berensztejn (Brazil)
Mark L. Rigolle (Belgium)
Robert Bednarek (United States)

The address of all Star One officers and directors is Praia de Botafogo 228, 3o. Andar
22250-906 - Rio de Janeiro, Brazil.

(*) Appointed pursuant to the by laws.



**Amended STAR ONE C1 Space Debris Mitigation Plan
(prepared for the Federal Communications
Commission)**

ISSUE/REVISION: 1.0

ISSUE DATE: 18 November 2005

<i>Prepared by:</i>	<i>Title</i>	<i>Organisation</i>	<i>Signature</i>	<i>Date</i>
E. Paiva	Orbital Operations Supervisor	STAR ONE		

<i>Approved by:</i>	<i>Title</i>	<i>Organisation</i>	<i>Signature</i>	<i>Date</i>
J. Rocha	Head of Satellite System Division	STAR ONE		
L. Oliveira	Director of Engineering	STAR ONE		



STAR ONE C1 Satellite Control and Operations

Amended STAR ONE C1 Space Debris
Mitigation Plan

Date 18 November 2005

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1. Introduction

In July 2005, STAR ONE filed a petition with the Commission to place its satellite, STAR ONE C1, located at 65° W.L., on the permitted space station list.¹ Pursuant to the Commission's Second Report and Order in IB Docket No. 02-54², and its Public Notice published on October 13, 2005, STAR ONE is amending the above referenced petition to include this amended orbital debris mitigation plan.

2. Related Documents

2.1. Applicable Documents

The following documents are applicable to the extent specified herein.

1. STAR ONE General Debris Mitigation Plan. IT_MECCEL_G20.
2. FCC. Orbital Debris Mitigation Standard Practices. FCC 04-130. June 21, 2004.

2.2. Reference Documents

The following documents have been used to support the preparation of this present document:

1. IADC Space Debris Mitigation Guidelines. IADC-02-01. 15 Oct 2002.
2. Space Product Assurance. Safety. ECSS-Q-40A. 17 May 2002.
3. Orbital Debris Mitigation Standard Practices. FCC 04-130. 21 June 2004.
4. NASA Safety Standard. Guidelines and Assessment Procedures for limiting Orbital Debris. NSS 1740.14. Aug 1995.
5. Environmental Protection of the Geostationary-Satellite Orbit. ITU-R S.1003. 1993.
6. UNCOPUOS. Technical Report on Space Debris. 1999, New York.
7. U.N. Article VI and VII of The Outer Space Treaty.
8. Public Notice – Disclosure of Orbital Debris Mitigation Plans; DA 05-2698, Report No. SPB – 112; October 13, 2005.
9. Risque de collision en mise à poste géostationnaire, DCT/SB/MS/2004-141, CNES.
10. Risques de collisions sur orbite d'injection GTO, ASP-03-TL/PS/IA-33, ALCATEL Space.
11. Collision risks in STAR ONE C1 Leap and recommendations for risk mitigation.
12. STAR ONE Quality Manual.

¹ STAR ONE S.A, Petition for Declaratory Ruling to Add the STAR ONE C1 Satellite at 65° W.L. to the Permitted Space Station List, SAT-PPL-20050706-00143 (filed July 5, 2005).

² *Mitigation of Orbital Debris*, Second Report and Order, 19 FCC Rcd 11567 (2004).



3. STAR ONE C1 Hardware Design

- STAR ONE C1 is being manufactured by ALCATEL ALENIA SPACE ("ALCATEL") according to ALCATEL standards and specifications, in accordance with STAR ONE's contractual requirements.
- STAR ONE C1 carries a chemical propulsion system for attitude and orbit control.
- STAR ONE C1 will not experience any planned release of debris during its operation, other than outgassing materials and thruster firing gases. Furthermore, the STAR ONE C1 satellite will retain all separation and deployment mechanisms and any other potential source of debris.
- STAR ONE C1 will be launched in mid 2006, and the end of useful life is not expected to occur before early 2021.
- STAR ONE has assessed and limited the probability of STAR ONE C1 becoming a source of debris by collisions with small debris or meteoroids that could cause loss of control and prevent post-mission disposal.
- ALCATEL has assessed the probability of damage to a satellite with the same basic design as STAR ONE C1 caused by debris or meteoroids smaller than one centimetre in diameter and has limited the effects of such collisions through the installation of shielding.
- STAR ONE C1 carries several subsystems necessary to accomplish end-of-life disposal. Each subsystem has been assessed by ALCATEL for its vulnerability to collision with small debris.
 - The propulsion subsystem was designed in such a way that it will not be separated from the spacecraft after deorbit manoeuvres. It has been reasonably protected from the effects of collisions with small debris through shielding. Moreover, propulsion subsystem components critical to disposal (e.g. propellant tanks) are located deep inside the satellite, while other components, such as the thrusters, externally placed, are redundant to allow for deorbit despite a collision with debris.
 - All components of C1's TT&C subsystem are redundant, and there are no single points of failure in the subsystem. The STAR ONE C1 TT&C system is equipped with two omni directional antennas mounted on opposite sides of the spacecraft. Each antenna provides greater than hemispherical coverage patterns, for both command and telemetry, and each is capable of accomplishing orbit raising independent of the other. The command receivers, decoders, telemetry encoders and transmitters are totally redundant. While STAR ONE's access to TT&C capability will be reduced in the event one of the omni directional antennas is damaged by debris, the redundancy built into the antenna system ensures that STAR ONE will be able to complete disposal of the satellite. Any failure of one TT&C component due to collision with debris or small meteoroids will not impact STAR ONE's ability to control the C1 satellite.
 - The remaining electrical supply, data handling, attitude and orbit control, and thermal control subsystems have been evaluated by ALCATEL for their susceptibility to collisions with small debris.

- ALCATEL has determined in its assessment that the probability of failure of the analysed satellite (same basic design as STAR ONE C1) due to orbital debris penetration is no greater than one percent.

4. Minimizing Accidental Explosions

- STAR ONE will operate STAR ONE C1 in conformance with ALCATEL's recommended operational procedures that control and limit the probability of accidental explosions during on-going operations. ALCATEL has performed a Failure Mode Effects and Criticality Analyses (FMECA) for STAR ONE C1.
- As part of the end-of-life activities, STAR ONE C1 power conversion and distribution units will be rendered inactive, such that debris generation will not result from the conversion of energy sources on board the spacecraft into energy that fragments the satellite. For STAR ONE C1, this involves the following:
 - Depleting the propulsion system and, where possible, leaving open propellant lines and valves.
 - Leaving all batteries in a state of permanent discharge by isolation of the battery charge circuits and leaving certain loads connected to the batteries.

5. Safe Flight Profiles

- STAR ONE has assessed and limited the probability of STAR ONE C1 becoming a source of debris by collisions with large debris or other operational space stations. Reference documents # 9, 10, 11 are related to Low Earth Orbit Phase assessments. STAR ONE subscribes to Space-track for space surveillance data, and it is currently assessing several studies on collision risk assessment for ongoing operations in stationkeeping.
- STAR ONE C1 will support geostationary operations at 65° W.L., filed with the ITU and ANATEL, as a replacement to the BRASILSAT B2 satellite after a short period of collocation with BRASILSAT B2. STAR ONE will use a collocation technique known as eccentricity-inclination vectors separation. STAR ONE has conducted an extensive Monte Carlo analysis in order to guarantee a minimum 10 Km separation between the B2 and C1 satellites at all times.
- STAR ONE has reviewed the ITU database (SNS) for networks for which a coordination request has been published, the LyngSat database and the Commission's IBFS database to identify every space station that is in operation, or is progressing toward launch, in the range of 65° W.L. +/- 0.2°. At this time, only the BRASILSAT B2 satellite operates at 65° W.L. There are no pending applications before the Commission to use the 65° W.L. slot. With regard to networks filed with the ITU, the only non-Brazilian filing in the immediate vicinity of 65° W.L. is the V-band USASAT-41G network 65° W.L. This network has not been assigned to any operator nor does the Federal Aviation Administration Commercial Space Station Third Quarter 2005 Launch Report show a pending launch for this network. STAR ONE

concludes that physical coordination of the STAR ONE C1 satellite with another satellite operator will not be required.

- STAR ONE will engage in physical coordination discussions with operators of any future satellites destined for 65° W.L.
- STAR ONE has already performed several satellite relocations, from one orbital location to another, during its 20 years of orbital operations activities. For all of them, the minimum drift rate used was 0.3 deg/day in order to comply with a minimum height of 20 Km from the nominal geostationary orbit. Fly-by coordination with all satellite operators, in the range of the initial and final longitude, has been undertaken accordingly, as well as coordination before any special commanding or emergency activities.
- STAR ONE C1 will be controlled within its designated orbit control window by standard routine periodic orbit correction manoeuvres. In case of anticipated violation of the window, correction manoeuvres would be implemented to avoid such violation.
- STAR ONE C1's design is such that high levels of thruster activity and orbit perturbation are not expected to happen due to foreseeable on-board events.

6. STAR ONE C1 Post-Mission Disposal

STAR ONE has planned the post-mission disposal activities for STAR ONE C1 as follows:

- STAR ONE C1 will be manoeuvred to a disposal orbit with a minimum perigee of 300 Km above the normal GSO operational orbit as determined by the IADC formula required under the Commission's Second Report and Order.³ Sufficient fuel shall be retained to raise the satellite to an orbit having a perigee of at least such altitude with a probability of success of 99%. The necessary number of manoeuvres will raise the satellite orbit such that the above minimum perigee is obtained.

The parameters used to calculate C1's disposal orbit follows:

- Solar radiation pressure coefficient (C_R): 1.3
- End-of-life area-to-mass ratio (A/m): 0.049 m²/Kg

Therefore the Minimum Disposal Orbit Perigee Altitude:

$$\begin{aligned} &= 36021 \text{ km} + 1000 \times C_R \times A/m \\ &= 36021 \text{ km} + 1000 \times 1.3 \times 0.049 \\ &= 36084.7 \text{ Km} \\ &= 298.7 \text{ Km} \end{aligned}$$

³ Second Report and Order at ¶ 68.



The actual disposal orbit will be increased to 300 Km above the normal geostationary orbit.

- STAR ONE will reserve approximately 9 Kg of propellant to complete STAR ONE C1's deorbiting manoeuvres.
- Orbital dynamics software was used to generate the amount of propellant required to raise the orbit at the end of life, considering that the final spacecraft mass will be a sum of satellite dry mass, the propellant residuals and the uncertainty associated with the amount of propellant allocated for dispersion corrections.
- ALCATEL has assessed propellant-gauging uncertainty and has provided an adequate margin of propellant reserve to address the assessed uncertainty.
- The satellite tracking, TM and TC usage are planned so as to avoid electrical interference with other satellites and are coordinated with any potentially affected satellite networks.
- During the orbit raising manoeuvres, the tracking, TM and TC frequencies will be limited to those where the satellite is authorized to operate.

7. Notifications

STAR ONE undertakes to provide the relevant bodies as required (UNCOPUOS, FCC, ITU, etc) with all appropriate notifications as required by law or regulations for STAR ONE satellites including but not limited to those concerning initial entry of service, location, relocations, inclined orbit operations and re-orbiting operations.

8. ISO 9001:2000 Certified Company

STAR ONE is an ISO 9001:2000 certified company and received its certificate of conformance from ABS Quality Evaluations, Inc., applicable to PROVISION OF SATELLITE CONTROL, TRACKING AND LAUNCH SUPPORT SERVICES, originally in 22 July of 1998. ISO 9001:2000 is a series of international guidelines / standards used for the development of quality systems for worldwide acceptance (Certificate Number : 33784).