

United Nations/Brazil Symposium on Basic Space Technology
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Small Satellites: Challenges of the Brazilian National Space Law and Policy

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"I was born and raised in the middle of the war. I saw violence and a lot of people dying. I was afraid, very afraid. I did not want to see hate ever again. What I want is that the humanity live in peace"

- Vietnamese broadcast on Castro's satellite. Voice message from children around the world who asked for peace between nations.

Júnior Torres de Castro (1933-2018), a Brazilian engineer who, using own resources, build the first Brazilian satellite for educational and humanitarian purposes that was launched in 1990. He was nominated for the Nobel Peace Prize. He was the first and (so far) the only private person to launch a satellite.



Oscar-Dove17

OUTLINE

- Brazilian Small Satellite Program
- Legal Framework Overview
- Policy Framework: The Brazilian National Plan For Space Activities (*PNAE 2012 – 2021*)
- The Provisional Draft of the Brazilian National Legislation for Space Activities - *a Non-Governmental Initiative*
- Recommendations for establishing a National Space Legislation
- Recommendations for establishing a Brazilian National Policy for Small Satellite

Brazilian Small Satellite Program

Begining	1993-1997: Data Collection Satellites (SCDs) series.
Purpose	education, research and operational applications
Applications	earth observation, observation of weather and Atmosphere, Experiments for Mission Technology, Exploration of Celestial Bodies
Regulatory Authority	Brazilian Space Agency (AEB)
Lauching Area	Alcantara Launch Center, Alcantara city, Maranhão, Brazil Barreira do Inferno, Natal city, Rio Grande do Norte, Brazil
Launcher Vehicle	Veículo Lançador de Microsatélites (VLM) – Microsatellite Launcher Vehicle – Brazil & Germany cooperation (in construction) Atmospheric Reentry Satellite (SARA)
Academic Institutions	Instituto Tecnológico de Aeronáutica (ITA) : Technological Institute of Aeronautics
Research Institutions	® Instituto Nacional de Pesquisas Espaciais (INPE) – National Institute for Space Research) ® Instituto de Aeronáutica e Espaço (IAE) – Institute of Aeronautics and Space - Militar Institution
Government Initiatives	® Sistema Espacial para Realização de Pesquisa e Experimentos com Nanosatélites (SERPENS)_ - Spatial System for Conducting Research and Experiments with Nanosatellites ® Centro Vocacional Espacial (CVE) – Space Vocational Center – Brazilian Space Agency program with partnership between the Barreira do Inferno Launch Center, Paramirim Education Secretary ® Multi-Mission Platform:



Tancredo-1



VLM-1

Brazilian Small Satellite Program (I)

Project/uu	Platform	Year	Launch Vehicle	Mission	Producer	Status
OSCAR-DOVE17	CubeSat – 12,92 kg	1990	Ariane 40 H10	Educational, Amateur Radio	BRAMSAT	Retired
SCD-1	115 kg	1993	Pegasus	Data collection	INPE	Active
SCD-2A	115 kg	1997	VLS-1	Data Collection	INPE	Failure
SCD-2	117 kg	1998	Pegasus	Data Collection	INPE	Active
SACI-1	60 kg	1999	CZ-4B	Scientific	INPE	Failure
SACI-2	80 kg	1999	VLS-1	Scientific	INPE	Failure
SATEC	65 kg	2003	VLS-1	Technological	INPE	Failure
UNOSAT	8 KG	2003	VLS-1		North of Para University	Failure
NANOSAT- BR1	1 KG	2014	Dnepr-1	Scientific, Technological, Academic	CRS/CCR/INPE-MCT	Active
AESP	1 kg	2015	Falcon-9	Scientific	ITA-INPE	Failure
SERPENS	Nanosatellite 3 KG	2015	H-IIB	Scientific, Technological, Academic	Consortium:	Retired
TANCREDO 1	Picosatellite 750 gr	2017	H-IIB	Geoscience, Technology	Tancredo Almeida Neves Municipal School/INPE/AEB/GAUSS	Retired
EQUARS	500 kg	2020	VLM	Scientific	INPE	Planned
VCUB1	10 kg	2020	To be defined	Remote Sensing, Data Collection	VISIONA/SENAI EMBRAPI	Planned
ITASAT-1	8 kg	2018	Falcon-9	Data Collection	ITA	Planned
Sabia-Mar	500 kg	2018	To be defined	Remote Sensing	INPE/ CONAE (Argentina)	Planned

LEGAL AND REGULATORY FRAMEWORK OVERVIEW - SMALL SATELLITES – INTERNATIONAL LEVEL

Outer Space Treaties

- Outer Space Treaty (1967): arts. VI, VII and VIII
- Liability Convention (1972)
- Registration Convention (1975)
- UNGA Resolutions and set of principles

Governmental Organizations

- ITU & UNOOSA: Guidance on Space Object Registration and Frequency Management for Small Satellites – UN Doc. A/AC.105/C.2/2015/CRP.17
- Inter-Agency Space Debris Coordination Committee (IADC)/United Nations Space Debris Mitigation Guidelines
- COPUOS Legal Subcommittee Agenda 14: “General Exchange of Views on the Application of International Law to Small Satellites
- - Questionnaire on the Application of International Law to Small Satellites: April 2018 Brazilian answer

Non-Governmental Organizations

- International Amateur Radio Union (IARU)
- CubeSat Organization

LEGAL AND REGULATORY FRAMEWORK – OVERVIEW (I) – NATIONAL LEVEL - BRAZIL

- Lack of a National Space Legislation
- No specific decree or regulation
- Coordination: Directory of Satellites and Applications of the Brazilian Space Agency (AEB)
- *Agencia Nacional de Telecomunicações (ANATEL)* – National Telecommunication Agency: frequency coordination
- AEB: Registration of space objects which is applicable to all national satellites
- AEB: No specific Licensing or Authorization for Small Satellites



POLICY FRAMEWORK: THE BRAZILIAN NATIONAL PLAN FOR SPACE ACTIVITIES (PNAE)

- Highest priority driving industrial progress
- Developing critical technologies
- Expanding international partnerships by prioritizing joint technological development
- Encouraging funding of public and/or private partnerships
- Improving domestic space governance integration
- Developing capacity building to space activities (Science without Borders federal program)
- **Creating a general law for space activities**
- Promoting public awareness



THE PROVISIONAL DRAFT OF THE BRAZILIAN NATIONAL LEGISLATION FOR SPACE ACTIVITIES – A NON-GOVERNMENTAL INITIATIVE

Elaborated by the Centre of Space Law Studies (NEDE) of the Brazilian Association of Air and Space Law (SBDA)

- Founded in 1950 and declared of public interest in 1952
- Non-profit civil organization
- Group of experts under the leadership of Professor José Monserrat Filho
- Members: Brazilian Space Law specialists from Brazil, Canada, Italy and Germany



Source: http://images.businessweek.com/ss/08/12/1230_queens_school_tour/7.htm

THE PROVISIONAL DRAFT OF THE BRAZILIAN NATIONAL LEGISLATION FOR SPACE ACTIVITIES – A NON-GOVERNMENTAL INITIATIVE (II)

- Presentation in 2014 during the 53rd Session of Legal Subcommittee of the United Nations Committee on Peaceful Uses of Outer Space.
- Paper presented at 65th International Astronautical Congress in 2014, Toronto, Canada
- 20 Articles, 15 Chapters

Developing a Provisional Draft of the Brazilian National Legislation for Space Activities: a Non-governmental Initiative



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53rd Session of UN COPUOS Legal Subcommittee, 2014



THE PROVISIONAL DRAFT OF THE BRAZILIAN NATIONAL LEGISLATION FOR SPACE ACTIVITIES A NON-GOVERNMENTAL INITIATIVE (III) – SOURCES FOR THE PROVISIONAL DRAFT

- International space law treaties
- *“Recommendations on National Legislation relevant to the peaceful use of outer space”*, approved by the General Assembly in 2013
- International Law Association (ILA) Sofia Guidelines
- International Telecommunication Union (ITU) instruments
- **Brazilian National Plan for the Space Activities (PNAE 2012-2021)**
- Law 8.854/1994 and other Administrative Acts
- Comparative approach with other national legislations
- Brazilian foreign policy conducted by the Ministry of External Relations

THE PROVISIONAL DRAFT OF THE BRAZILIAN NATIONAL LEGISLATION FOR SPACE ACTIVITIES – A NON-GOVERNMENTAL INITIATIVE (IV) – **KEY PROVISIONS OF THE DRAFT**

- Peaceful use of outer space and national development
- General definitions
- Delimitation of outer space
- Safety, security and sustainability of outer space
- administrative organization of Brazilian space activities
- Observance of ITU instruments
- **Regulations of small satellites**
- Responsibility/liability
- Insurance
- Commercial space activities
- Registration of space objects
- Distribution of remote sensing images
- Solutions of controversies
- Etc

THE PROVISIONAL DRAFT OF THE BRAZILIAN NATIONAL LEGISLATION FOR SPACE ACTIVITIES – A NON-GOVERNMENTAL INITIATIVE (V)

CAPÍTULO VIII DAS NORMAS DA UNIÃO INTERNACIONAL DE TELECOMUNICAÇÕES

Art. 9º. É competência da AEB colaborar com os órgãos pertinentes do Ministério das Comunicações e com a Agência Nacional de Telecomunicações (ANATEL) no planejamento das necessidades do País em satélites de comunicação, inclusive com a definição de órbitas e respectivas radiofrequências requeridas para atendimento de tais necessidades.

§ 1º. A AEB prestará assistência à ANATEL na missão de representar o País junto à União Internacional de Telecomunicações (UIT) e em outros organismos internacionais e regionais de telecomunicações.

§ 2º. Todos os satélites nacionais e estrangeiros lançados do território nacional e/ou que prestem serviços no País devem cumprir as normas da UIT sobre a publicação antecipada, a coordenação e a notificação, em conformidade com os tratados de que o Brasil é parte.

CAPÍTULO IX DO PROGRAMA DE PEQUENOS SATÉLITES

Art. 10. A AEB desenvolverá um programa especial de pequenos satélites, mobilizando universidades, centros de pesquisa e empresas nacionais, públicas e privadas, tanto para fomentar a formação qualificada de recursos humanos para a área espacial, quanto para atender às necessidades nacionais na exploração e uso do espaço exterior, sejam no campo da pesquisa científica e tecnológica, coleta de dados ambientais, sensoriamento remoto e observação da Terra.

Parágrafo único. Todos os pequenos satélites lançados sob a responsabilidade do Brasil serão comunicados à UIT com a devida antecedência e ao Secretário Geral das Nações Unidas, bem como inscritos no Registro Nacional de Objetos Espaciais lançados ao Espaço Exterior.

RECOMMENDATIONS FOR ESTABLISHING A NATIONAL SPACE LEGISLATION

- Working Group for a National Space Legislation of the Development Committee of the Brazilian Space Program (Decree no. 9.279/2018)

**SBDA/NEDE Provisional Draft
of the Brazilian National
Legislation for Space
Activities as a source**

**Platform of dialogue
between all players:
Gov, Non-Gov, Industry, Univ.**

RECOMENDATIONS FOR A BRAZILIAN NATIONAL POLICY FOR SMALL SATELLITE

1. SMALL SATELLITE POLICY

- PNAE recognizes the opportunity but does not give specific guidance towards their use

2. INSURANCE

- Implementation of a national policy regarding insurance, that scales the minimum third party liability, depending on the size of the launch

RECOMENDATIONS FOR A BRAZILIAN NATIONAL POLICY FOR SMALL SATELLITE (II)

3. STARTUPS PROGRAM

- Grants
- Financing
- Competitions (ESA – Copernicus Master Competition)
- Benefits: bring innovation, new jobs, increase of space industry, etc..
- Europe level: ESA Business Incubation Program (50k), Horizon 2020 (50k)
- Regional Programs: Germany – State of Hessen, FKC Financing Program
- Top 5 small satellite startups:
 - Planet Labs (US), Spire Global (US), Satellogic (Argentina), Earth I (UK), Spaceflight Industries (US)



RECOMENDATIONS FOR A BRAZILIAN NATIONAL POLICY FOR SMALL SATELLITE (III)

4. Small Satellite Government Agency/Department

- Reduces the regulatory complexity for players in the small satellite industry

5. Adoptions:

- ITU & UNOOSA: Guidance on Space Object Registration and Frequency Management for Small Satellites
- Inter-Agency Space Debris Coordination Committee (IADC)/United Nations Space Debris Mitigation Guidelines

Thank you!

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