

# Thailand Disharmony in International Practice of Satellite Business Regulation

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## Abstract

Satellite business is increasingly important to people's daily lives when it comes to telecommunication as well as adaptation to economic and social policies. Therefore, the efficient development of Thailand's satellite industry is important. For Thailand to become successful in the satellite industry, we need to focus on both space as well as earth. Besides a clear policy on whether close or open space, government agencies must design a policy to fulfill the satellite ecosystem. This is because the success of Thailand's satellite industry will affect other industries locally as well. In this paper, we will discuss satellite industry ecosystem, Satellite orbit regulatory, as well as the congestion of the geostationary satellite orbit spectrum. We will also discuss satellite regulation and licensing in Thailand. We will then study what ASEAN can learn from the European Satellite Commission. We will also take a look at literature reviews, as well as study various articles from both domestic and international space and technology ventures that experienced development issues.

## Keywords

Licensing, Orbit, Satellite, Regulation, Thailand

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## 1. Introduction

This template, The International Telecommunication Union (ITU) has allocated the satellite orbit to all countries "fair and Equitable" basis. The domestic use of said satellites in the band must work within orbit that has been allocated. And

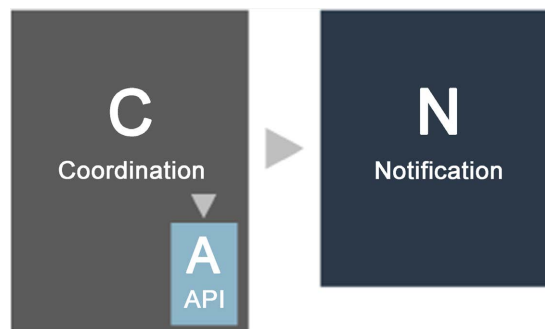
satellite must be designed for the technical specifications in accordance with the requirements of the ITU radio control (Jannat C. Thompson, 1996). Interestingly, ITU has managed satellite orbits for countries around the world under The Outer Space Treaty Article II. Thailand first signed with The Outer Space Treaty Article II in January 27, 1967 following to this contract of Outer space, including the moon and other celestial bodies. It is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means. This means that all objects in deep space are not subject to sovereignty or possession by any one country. This includes the orbits of satellites aligning with Earth or the orbit of the geostationary satellites above the Earth's equator. It cannot be allocated to any country for a distance of more than 35,000 kilometers. Or to put it another way, the geostationary satellite orbit is 120 or 78.5 degrees east. Thailand is licensed to operate by consensus among the members of the International Telecommunication Union, which has more than a hundred countries and does not fall under the sovereignty of Thailand.

Therefore, the use of geostationary orbit is subject to a mutual agreement on the basis first come first serve, starting with the country that needs to use which orbit. They must provide units for government jobs acting as ITU Admin go into the Filing process, with applicable steps starting with A (Advance Publication Information), C (Coordination) and N (Notification) as shown by **Figure 1** (ITU, 2017).

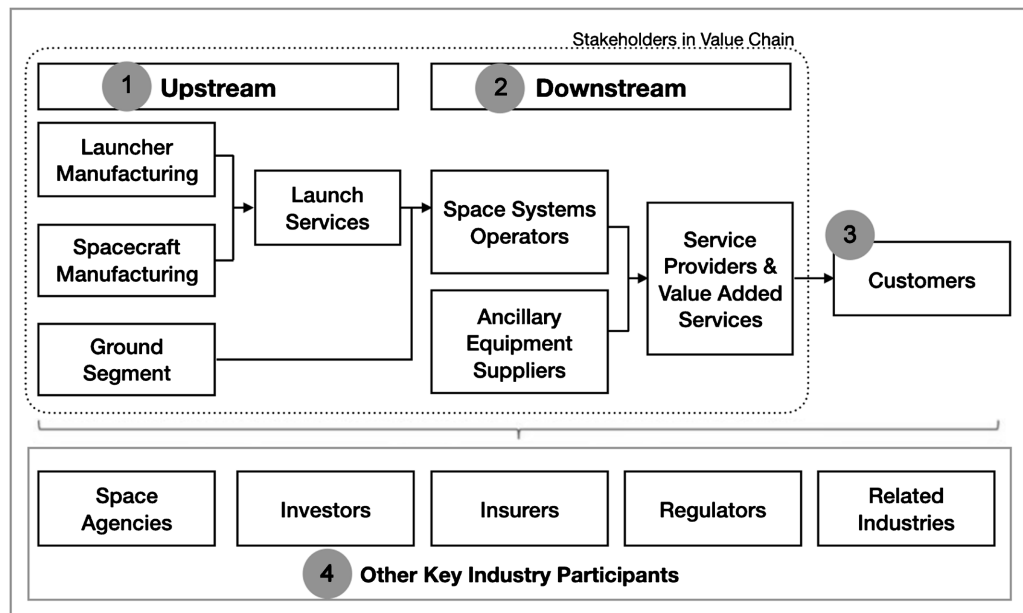
This important process will require frequency coordination with nations whose space objects are in the network and are affected when new satellites are launched in all operations. This includes the launch of satellites into orbit and must be completed within 7 years from the date of submission of documents as shown by step A. Once the filing process is complete, the country of operation will be granted access rights and orbit as requested. This however, does not mean that orbital rights are the same as ownership rights. This means blocking the use of other nations is also prohibited. In fact, any country who wishes to conduct space activities without adversely affecting other countries conducting space activities are free to do so.

## 2. Satellite Industry Ecosystem

Satellite industry ecosystem is shown in **Figure 2** (Euroconsult, 2021), that includes (Euroconsult, 2021; Alina Orlova et al., 2020):



**Figure 1.** Filing Process [Source: ITU, 2017].



**Figure 2.** Satellite Industry Ecosystem-Overview [Source: Euroconsult, 2021].

1) Upstream Business: refers to a business group before the satellite will be applied, such as launcher manufacturing, satellite manufacturing, ground station, control center, launch service, etc.

2) Downstream Business: refers to a business group derived from satellite applications in various fields such as military applications. Commercial use such as, for communication or surveys. Including to a group of distributors of accessories for use such as amplifiers, etc.

3) Customers: government sectors, private sectors and individual customers.

4) Other stakeholder: regulatory agencies, satellite business leaders and people affected by the satellite industry.

### 3. Satellite Orbit/Spectrum Regulatory System

The United Nations space treaty could be compared to a constitution that governs Earth's space. Despite the fact that in the treaty, 'space' is not clearly defined, in principle, it is looked at as the Karman Line, an imaginary boundary 100 kilometers above mean sea level.

Based on the idea that space belongs to humanity instead of one country, this means that there is no need for supervision. But those who take this view, have realized that with it, various problems occurred. This includes (Antesky Science Technology Inc., 2019):

1) The problem of damage from space objects caused by collisions between space objects or space craft crashing.

2) The problem of interfering with the frequencies caused by frequencies applied to space objects and/or the frequency used in terrestrial device interference.

Over the last few decades, the use of telecommunication satellites have increased their applications became part of day-to-day living. As the number of

satellites in space increase, spacing has become critical for countries to receive the most from their space assets. Over the decades, operators of space assets have turned to constellations that at times are in the thousands in the number of satellites. However, constellations of this size have brought about the risk of collisions and the creation of debris. Starting as a measure for spectrum management, the international community agreed to regulate the assignment of slots in the geostationary earth orbit (GEO) belt through the International Telecommunications Union (ITU). The ITU is mandated to allocate spectrum and register frequency assignments, orbital positions and other parameters of satellites. The ITU radio regulations comprise an international treaty establishing the framework for the utilization of radio frequencies and satellite orbits among its ITU member countries. The organization registers orbital slots to administrations who apply for them on behalf of satellite operators. Once assigned, the orbital slot associated with frequencies must be used for a given category of ITU service within a given time-frame. Orbital slotting is allocated on a First-Come-First-Served basis (ITU, 2012). The slotting is free and is owned for the duration of a satellite's lifetime, typically 15 years. Usually, the operators keep refiling for the slot and replace old satellites with new ones and therefore, they tend to keep the orbital slot indefinitely.

#### **4. Congestion of the Geostationary Satellite Orbit Spectrum**

The most developed countries of the world from North America, Europe and Asia have launched several thousands of objects that have congested the geostationary orbit and left few or no slots for new entrants into the market (Africanews.space, 2020). Only a few opportunities remain for satellite operators to develop new positions or make better use of existing slots. According to industry experts, making better use of existing slots is a multi-faceted debate with no easy answer as to what can be done to create additional room for more satellites. While there are arguments that more can be done to free up slots and develop existing locations more effectively, there is a unanimous agreement that there are no strong orbital slots that are unused or not already spoken for, as a majority have been allocated to satellites already under construction and expected to launch in the near future. According to the Independent UK, as of 2019, there were 1800 available spaces in the geostationary orbit, which is located approximately 35,000 km above earth's equator (Independent, 2017). Some regions are more heavily utilized than others, particularly in the C-band and Ku-band frequencies. However, growth opportunities are reported to exist in regions such as Latin America, Africa, and parts of Asia-Pacific (Morgan Stanley, 2020).

#### **5. Satellite Regulation and Licensing in Thailand**

As for the past satellite auctions in Thailand, many assumed that it was an orbital auction. Satellites that Thailand has the right to own are allocated by the International Telecommunication Union. Interestingly however, the contract of The Outer Space Treaty does not provide the right of any country to have sove-

reignty over the satellite orbit. Therefore, the satellite orbit does not possess this right. Possession of Thailand/Thai Government so that Thailand/Thai government cannot bring satellite orbit auction to raise money for the nation.

Auction in 1991, Thailand Telecom industry was monopoly-oriented scheme, can count on Thai Satellite business also. Due to concern on National security, governmental policies had been structured on “Closed Space” policy. The auction is not designed the right to use spectrum and orbit but for monopolized Thai Satellite business for 8 years and got the right to continuously operate for 30 years. At that time, Thailand’s telecommunication business was not in the context of free competition, but still under the supervision of the government mainly for security reasons. However, the winning bidder had to perform the following actions (Bhumindr, 2019):

- 1) Prepare proposals for revenue sharing.
- 2) Provide a minimum income guarantee to the state in the amount of 1.415 billion baht throughout the concession period.
- 3) The state can use the satellite circuits in the C-Band 1 transponder frequency band throughout the term of the concession contract without paying compensation.

The auction in the satellite business September 2021 is a license to use satellite orbit with a package that has been performed before the concession contract expires on September 10, 2021. However, the package will consist of the filing that are both completed and in progress. However, the winning bidder must take action to bring the satellite into orbit within the specified period.

The September 1991 satellite auction may have negatively impacted the interests of the industry and consumer benefits. This is because setting a minimum price in the auction to focus on generating the highest revenue for the government was ultimately inconsistent with industry conditions and then caused many obstacles in bringing satellites into orbit within the specified time of the International Telecommunication Union (ITU).

An example of this may have been the 50.5-degree east orbit at the license status of Thailand. According to stipulations, a country must bring said satellite into orbit within a period of less than two years. If this cannot be achieved, the right of consideration will be given to another country and in the event that Thailand wants to continue with their efforts, they must reapply for said right which is both costly and time consuming.

Because of this, it is imperative that various restrictions be lifted given the fact that the competition is so intense. The ability obtain orbit licenses should be given to any operator. The first come, first served technique, used for a long time in satellite telecommunications law in order to allocate the natural resources of space (geostationary orbit, frequency spectrum) between States, is in the foreground currently in the context of the allocation of domain names allowing access to the Internet.

In the past, the concept of telecommunication services was related to state security and would require a large investment in order to purchase Install equip-

ment and set up telecommunication networks to provide space for nationwide coverage. To put it another way, it was a business that was a state monopoly.

Later, however, Thailand joined as a member of the World Trade Organization (WTO) and has signed a general agreement on trade in services including bilateral negotiations with different countries to make agreements on free trade zones. This then obligates Thailand to liberalize the service. This now has caused an urgent need to improve the domestic legal system to support and prepare for such liberalization. This is the starting point for changes in the corporate governance system. Telecommunication needs to move from a monopoly system by government agencies into free and fair competition by the private sector and it needs to be possible to obtain a license from the regulator.

The policy guidelines of the state in this matter appear in Article 40 of the Constitution of the Kingdom of Thailand 1997 and it is provided that “The frequencies used in radio broadcasting television and radio telecommunication as a resource national communication for the public benefit, shall be an independent state organization to allocate such frequencies and regulate the care of business radio broadcasting, television broadcasting and telecommunications services. Any and all actions must take into account the best interests of the people at the national and local levels in terms of education, culture, state security and other public benefits. This of course includes “free and fair competition” which is the beginning of the abolition of the monopoly system in telecommunications. This comes under a system of authorization and supervision through the organization of the independent state which is under NBTC and drawn by the Act on the Organization to Assign Radio frequency and to Regulate the Broadcasting and Telecommunications Services B.E. 2553 (2010).

Moreover, the Telecommunications Business Act B.E. 2544 (2001) has also been enacted to repeal the telegraph and Telephone Act of 1937 which abolishes the monopoly on telecommunications by the state. In the past, the private sector only had the right to apply for a telecommunications business license.

Provided that Section 4 of the Act on the Organization to Assign Radio frequency and to Regulate the Broadcasting and Telecommunications Services B.E. 2553 (2010). “Telecommunication” is followed, “a business which provides services for transmitting, broadcasting or receiving signs, signals, letters numbers, pictures, sounds, codes, or anything else which can be understood by means of spectrum, cable system, optical system electromagnetic system or any other system, may be considered telecommunications businesses.

This however, does not include broadcasting business, television business, and radio communication. According to the aforementioned law, we can clearly see that Thailand possess legal precedent for all these matters.

Telecommunications liberalization in all types of telecommunication businesses includes the communication satellite business. Despite the fact that the goal of these laws is continual support, in practice, we find that many laws lack of specific guidelines or regulations that would be more than useful when it

comes to implementation.

The satellite positioned in a 120-degree east orbit, covers Asia, Australia, the Indian Ocean and parts of the Pacific Ocean. This is the original location of the Thaicom 1 satellite. The Ministry of Transport approved a decommission operation on January 18, 2010. The Ministry of Information Technology followed with a letter numbered No. 0100.4/1999 and dated September 8, 2011 to the Secretary-General of the Cabinet. The Cabinet approved the continued maintenance of the 120-degree east orbit by allowing Thaicom Public Company Limited to continue to be the operator and use the satellite filings at the 120-degree east position.

The work for the satellite to be procured and the Ministry of Information and Communication Technology will coordinate with NBTC to provide further consideration in issuing a license for Thaicom Public Company Limited to continue with telecommunication business.

Thaicom Public Company Limited has submitted an application for a Type Three Telecommunication Business License. The goal is to provide communication network services through satellite in the form of service for transponder using an orbit position at 120 degrees west. They of course issued and paid for the license application at a premium of 535,000 baht as laid out by the Telecommunications Business Act B.E. 2544 (2001).

This request to use the spectrum according to the Act The organization assigns frequencies and directs the radio broadcasting business. The Broadcasting, Television and Telecommunications Act B.E. 2543 (2000) allocates spectrum and regulates business operations of radio broadcast television and telecommunications business.

The Broadcasting Committee television business and the National Telecommunications Commission (NBTC) are responsible for issuing licenses and supervising telecommunications business for the telecommunications business. This corresponds to the transition from a monopoly system to a system of free and fair competition. All telecommunications are subject to law and are fully regulated by the National Telecommunications Commission. Therefore, the NBTC has approved Thaicom Public Company Limited to receive a license to operate type three telecommunication business. The goal is to provide communication network services via satellite business licensee. The third type is to provide communication network services via satellite. Any applicable regulatory measures must be observed in the future.

Therefore, the implementation of the third type of telecommunications business license issuance to Thaicom Co., Ltd is now official. As in every case, NBTC has proceeded with prudence, honesty, and correctness in accordance with the procedures prescribed by law and for the best interest of the nation.

## **6. What ASEAN Can Learn from the European Satellite Commission**

It is common knowledge that Europe has been a global leader in satellite op-

erations since 1957. In January 2021 Brussel forced a one-year feasibility study costing an astonishing 7.1 million euros to design its own independent space communications system from large European companies namely Airbus, Thalès, Orange and Eutelsat. This study will strengthen Europe's digital union and furnish secure connectivity for European citizens as well as European companies (European Space Policy Institute, 2021).

On April 27<sup>th</sup>, Paris-based Eutelsat made the unprecedented move to announce that it was using the one half billion dollar proceeds from the U.S. C-Band frequency auction to purchase 24% share in OneWeb, The London-based LEO satellite venture.

The following December, Joseph Aschbacher general director of ASE (Agence Spacial European) legislated that leading European companies must compete with SpaceX, the renown American satellite company, which is owned and managed by Elon Musk. They have now launched more than 10,000 satellites, which could ultimately deprive European companies of profit and footprint, which are also developing commercial space projects.

Joseph Aschbacher announced that in the upcoming year space will become more limited in terms of frequency and orbit. Thus the European government ought to protect European companies from non-European space programs, especially from one person that process the half of all active satellites in the world authorized by the American commission communication Federal to launch Starlink satellite without the consent of other nations.

On January 25<sup>th</sup> 2022, at the 14<sup>th</sup> European Space Conference, the European Union announced that they were officially ready to present a constellation of satellite communications as a secure project on the 9<sup>th</sup> of February 2022. This was first announced by Thierry Breton, European Commissioner in external markets, in Brussels. He said that he will present this proposition to the council and the European parliament. It's his hope that the European parliament will take the issue seriously and quickly move toward negotiations which will lead to active service before the year 2024.

The cost of this constellation in its entirety comes to 6 million euro. The European Commission will offer this constellation multi-orbital system to all European countries including the army and government. This will be especially appropriate for non-coverage signal areas (SpaceNews, 2022).

In terms of what ASEAN can learn from the European Commission, it's important to note that the heavily state-funded European space industry has a brilliant track record in technical competence because of the full support of the government. It is the belief of many analysts that were ASEAN to take a similar approach in terms of heavy support by the state, we would see continual and quick development the satellite industry. Countries like Thailand have owned and operated several communications satellites since 1991, but they have all been foreign-made, and some are owned by the private sector. Therefore, a continual push to a state-funded space industry ASEAN is seen on many levels as



the key to the future (EU, 2020).

## 7. Conclusion

ITU has issued a resolution declaring that satellite orbit is a limited natural resource somewhat similar to a frequency. Therefore, it should be used sparingly and effectively in concert with other countries around the world. Subsequently, all countries possess equal right to take advantage of satellites in orbit. Therefore, it should not be taken for granted or given to those who have not been officially approved. To reiterate, any country to play a role in this must ensure they do not cause problems for other nations.

When it comes to space law, every country that plays a part must readily realize that they are indeed subject to an international agreement and must be fully ready and willing to cooperate with the international community. This means that when considering a specific action, mutual benefit must be assured. Because of continual advancement and change, it is imperative that each country develop a legal knowledge of space and understand the various technologies at play in order to be able to effectively work with the international community.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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