

# Strategies aimed at the Entry of Space Systems Business Enterprise to the Global Market

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## Abstract

In order to survive in the space industry market and to cope with the great changes affecting space industry projects it is essential for us to adapt our space business to suit the global market. NEC aims to provide “Global space system solutions” by setting the provision of small satellites as the core item of our space business agenda. To achieve this aim, expansion of our market share as well as improved product supply is essential in order that we are able to effectively enter overseas markets, especially those of the emerging space countries. Our space business agenda aims not only at selling space components but also at providing packaged hardware and software solutions. This policy is significantly different from trying to create business opportunities in the major space countries such as the European countries, the U.S.A., China or Russia. In order to deal with the space businesses of emerging space countries, cooperation between governmental agencies and the private sector is essential to support the business environment in its financial and engineering aspects. This is because such a program would be beyond the capacity of unaided private companies. In consideration of such conditions NEC aims to offer unrivalled solutions for space business in the overseas commercial markets.

## Keywords

overseas commercial markets, emerging space countries, small satellite, ODA, technology provision  
human resource development, export licensing, global space diplomacy

## 1. Introduction

The current state of NEC's overseas commercial share of the space systems markets includes delivery of satellite-borne components and subsystems primarily to the European and US manufacturers (SS/L: Space Systems Loral, BSS: Boeing Satellite Systems, LMCSS: Lockheed Martin Commercial Space Systems, EADS Astrium, and TAS: Thales Alenia Space) and also to Chinese and Russian satellite system manufacturers.

However, due to changing market trends and industrial policies such as a shift from “development” to “practical usage” and from “component manufacture” to “usage and solution provisions,” globalization is now becoming an essential part of the space systems market. In order to cope with such changes, NEC has established a vision for itself in the space systems business by becoming an enterprise providing global space business solutions by setting small satellites as its core space business ( Fig. 1 ).

This paper describes our agenda as the NEC space systems business enters the global market.

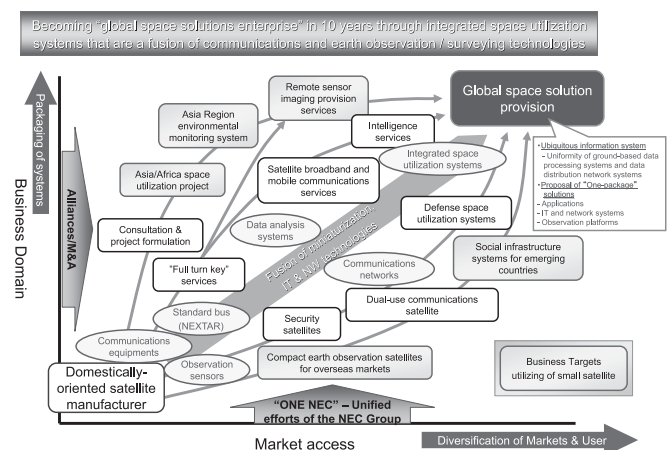


Fig. 1 NEC's space system business vision.

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### 2. Simultaneous Expansion of Product lines and Markets

Currently the main NEC space business penetration in overseas markets is the supply of component products to satellite system manufacturers. To expand our businesses scale it is essential to promote both “Product diversity (business domain)” and “Market expansion” ( Fig. 2 ).

To promote “Products diversity,” we must first of all, provide components and subsystems as our basic space business, and also promote further development of these products. We will subsequently provide satellite systems and finally will aim to provide “Total solutions” for the projected social infrastructures such as data applications to support terrestrial users.

When considering how we will promote “Market expansion,” we have to realize that the supply and demand of space businesses in Europe, Russia, China, India and Korea are almost fully served inside their own countries. Therefore, it is difficult for us to develop satellite system component businesses in these countries. Moreover, unlike communications satellites that are intended for commercial use, earth observation satellites have characteristics that suit governmental projects. Therefore, each country tries to develop earth observation satellites by itself, even if the developmental cost would be higher than that of importing them.

In consideration of such market conditions, we have decided to set our target to emerging space countries in Southeast Asia, Africa and the Middle East. These countries are expected to increase the demand for space products in the future.

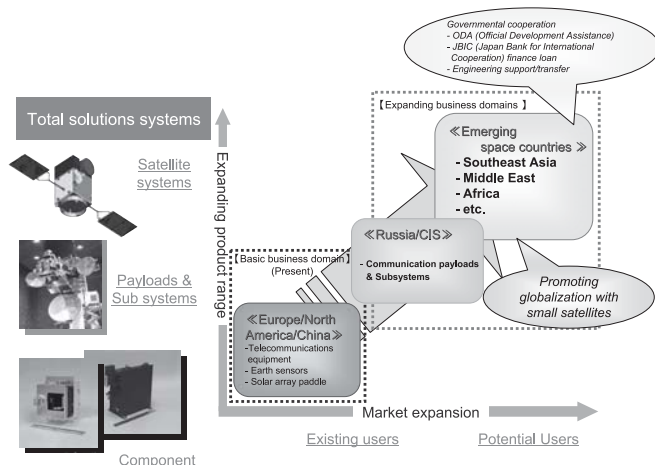


Fig. 2 Expansion of product markets.

### 3. Basic Strategies for Entering the Markets of the Emerging Space Countries

It is a fact that there is a need for space products in the emerging space countries. However, the details of these needs are not always clear, and this situation poses questions such as, “what sort of system is needed?” or “How will the systems or products be used.” It is essential first of all to consider specific needs, “What sort of problem do they have?”, “What sort of institutions or companies need the products?” or “Who will or should control these products?” In order to resolve these issues, we should provide optimum or so-called GCM (the Greatest Common Measure) solutions.

Moreover, unlike the major space countries, these emerging space countries do not have adequate financial resources for purchasing space products. It is therefore difficult for them to introduce state of the art, large-scale satellite systems that tend to be very expensive. As one solution, it is essential to propose that the emerging countries introduce rather low cost, small-size and high performance satellite systems while availing themselves of the economic assistance offered by the ODA (Official Development Assistance) or ECA (Export Credit Agency).

It is also essential to propose a human resource training menu; the so-called “Capacity Building” that is necessary when transferring such space system technologies, as most of the emerging space countries do not possess the requisite infrastructures, expert personnel or technologies.

We should first of all investigate and understand the conditions of such countries, and we should provide optimum services for them in a timely manner. Conditions vary in each of these countries. For example, some countries have to purchase existing data or minimal space systems with grant aid support, and other countries have already imported satellites and are planning to become independent participant countries in the space industry. Such countries may require entire space system facilities, including the know-how of satellite design, manufacturing methods and test equipment. NEC prepares a variety of menus to cope with such various needs flexibly, speedily and also individually.

However, as mentioned above, earth observation satellites have governmentally oriented characteristics and such tendencies are becoming more evident in the emerging space countries. The European countries such as France, U.K. Belgium, etc. and also China approach these emerging countries under umbrella of governmental-led projects. Even though NEC pre-

prepares a variety of menus to solve the needs of these emerging space countries, it is difficult for us, as an individual commercial company, to compete with the European countries or China. It is now becoming essential to arrange our strategy in the context of governmental cooperation.

NEC actively requests the Ministry of Economy, Trade and Industry, the Ministry of Finance, and the Ministry of Foreign Affairs and the Strategic Headquarters for Space Policy of the Cabinet Secretariat to create a cooperative relationship and to promote a “Space technology used for foreign diplomacy” project. This would be an interactive relationship between commercial companies and governmental agencies, “Space technology for foreign diplomacy,” which is for the establishment and promotion of friendship between countries and also for the stable supply of mineral resources and foodstuffs. “Foreign diplomacy for space technology” is for the economic assistance of the ODA, etc. and to enable leaders to negotiate between countries. Fig. 3 shows a packaged menu provision scheme for emerging space country users.

NEC’s space business domain provides total packaged menus according to the conditions of countries that introduce these menus. They cover the operational systems and technologies of advanced small-size satellites as well as human resources training menus to support the efficient operation of these systems. In cooperation with our governmental agencies, NEC will provide such systems and menus step by step within the range of a provision cycle from “the extraction and arrangement of usage needs (seeding)” to “the promotion and stabilization of using systems (industrialization)” (Fig. 4).

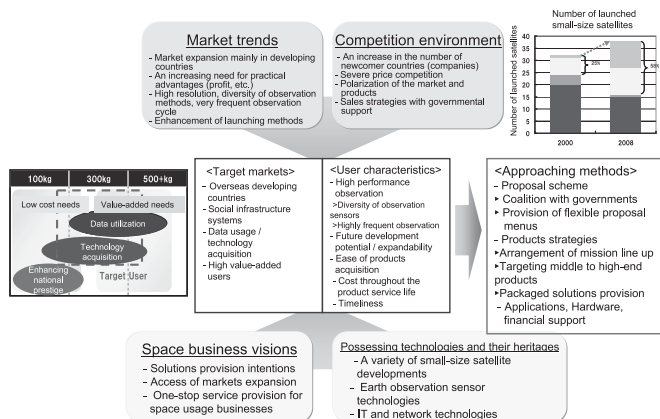


Fig. 3 Packaged menu provision scheme for emerging space countries.

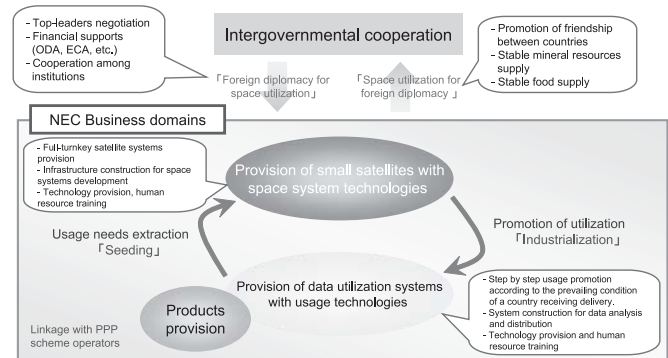


Fig. 4 Business development scheme for emerging space countries.

#### 4. Proposal Menu for Emerging Space Countries

In the earth observation satellite market of the emerging space countries, satellites to be used for remote sensing purposes support: disaster monitoring, environmental monitoring, resource and energy exploitation and agricultural applications, in most cases. However, the applications for such usages do not function with unsupported satellite systems. They also require various social infrastructures in order to be effective, including a telecommunications environment, GPS systems, etc. Other support items may be required according to the conditions of the delivered countries.

In addition, economic assistance is required for most of these countries because they do not have sufficient financial resources. Support mechanisms that correspond to the needs of each country have to be considered. Small-scale cooperative engineering schemes are ideal supports because they can be prepared in rather a short time. Financial support such as large-scale yen loans may also be considered.

Fig. 5 shows a menu of “applications,” “support items” and “support schemes (financial and technological).”

#### 5. Issues in Entering Emerging Space Country Markets

As described above, the scale of “financial resources,” “trade agreements” and “engineering skills” in emerging space countries differ significantly from those of the established space countries. To resolve these issues is far beyond the capacity of a commercial company. Cooperation and support at the governmental level is essential.

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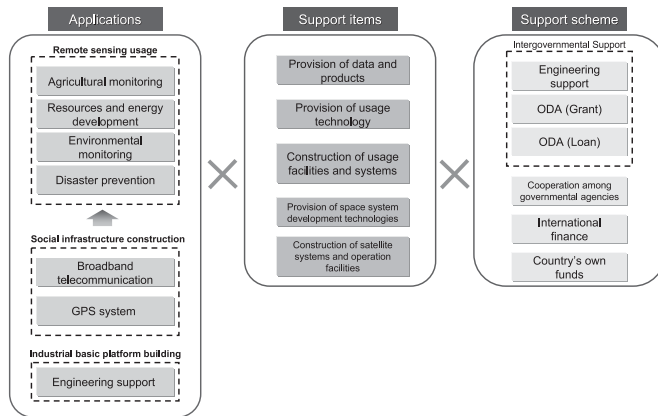


Fig. 5 Proposal menu for emerging space countries.

The following are the items that require support at the governmental level.

### (1) Expedition of ODA grant procedures

The issues to be sorted out among the related ministries (the Ministry of Foreign Affairs, the Ministry of Finance, and the Ministry of Economy, Trade and Industry) are as follows.

- 1) Is it appropriate to treat space systems as a "Basic Human Need," which is the basic premise of the ODA grant?
- 2) Is the five year term of yen loan financed support adequate for the projected satellite service life?
- 3) How can it be guaranteed that the provided space related technologies will not be applied for military usages?

### (2) Export License (EL) support

Issues regarding EL acquisition support (provision of products and technologies) and data policies (provision of image data) are as follows.

- 1) Limits of providing sensitive technologies (there is no clear definition for this matter at the moment).
- 2) A balance is sought between protection of domestic industry and competition with overseas industries while considering the implications of information disclosure in overseas markets.

### (3) Acceleration of space diplomacy

Active discussions among governmental agencies about the following issues are necessary.

- 1) Various provision opportunities (personnel training, satellite launch support, satellite data including image data, etc.)
- 2) Coordination between related ministries and agencies

It is necessary that all related ministries and agencies work together and adopt consistent concepts for the Japanese

space usage projects including agriculture, disasters (flood, etc.) and resources.

NEC has already received some governmental support and has started to promote activities to propose detailed projects targeting the emerging space countries. The export of space related systems to emerging space countries is without precedent in Japan. Such a venture will always face difficulties when being carried out without previous experience. However, we intend to resolve outstanding issues and we anticipate the establishment of suitable means of continuous prerequisite support for our space projects.

## 6. Conclusion

The outline of our strategies for entering the global space business market is given above. However, there are some issues that NEC must first of all deal with. We should cast aside preconceived ideas that the "space systems" and "satellites":

- (1) are the results of an integration of state-of-the-art technologies that are too expensive for developing countries.
- (2) involve high risk of being transferred to military usages.
- (3) are products that are too advanced to be employed by the developing countries.

As a countermeasure for item (1), we can arrange earth observation satellites or communications satellites as well as infrastructures to launch them at a reasonable cost and with a short lead time because of our satellite location superiority. If developing countries wish to build infrastructures of ground information systems of the same quality as those of the developed countries, it will require a great amount of capital and lead time. However, the small-sized high-performance satellite that NEC is developing, costs much less compared to satellites that have been developed at various research institutes so far.

As a countermeasure for item (2), it will be possible to prevent transferring them to military usages by investigating the political conditions of delivered countries, clarifying the usage purposes and suppressing the satellites performance (e.g. special resolution power, etc.) to a lower level than those of the conventional commercial satellites. Also, by adding clauses in the governmental official agreements in order to clarify the limits of usage purposes that can be expected to prevent such risks.

As a countermeasure for item (3), NEC can provide total packaged menus including technology transfer and human resource training, so that the delivered country (client country) can easily establish an infrastructure with the required facilities.

ties and human resources.

To end this paper, we would like to state that what NEC is pursuing in the space business domain is not just selling our products to gain company profits. What we pursue is contributing to developing a safe and secure social infrastructure in the emerging space countries. In order to achieve this objective, we aim to integrate NEC's IT and NW technologies with the innovative technologies of "space systems" and "satellites."

#### Author's Profile

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