IAC-05-E6.1.06

POLICY FOR COMMERCIALIZING CBERS DATA

Álvaro Fabricio dos Santos
National Institute for Space Research (INPE)
São José dos Campos, SP, Brazil
alvaro@dir.inpe.br

ABSTRACT

Since the launching of the Chinese-Brazilian CBERS-2 Satellite[1], in 2003, Brazil and China have joined these elite ranks of countries with remote sensing capacity, thereby shifting from user to supplier status. The quality of CBERS-2 images has been approved worldwide, leading China and Brazil to sign further agreements during the visit of the President of China to Brazil on November 12, 2004. Reflecting their commitment to enter the restricted market of commercializing remote sensing data, China and Brazil signed a joint research and development Protocol which included an annexed document entitled "CBERS[2] Data Policy". This policy was written in accordance with the current 1986 United Nations Principles Relating to Remote Sensing of the Earth from Outer Space, including special consideration for the developing world. Both States also signed another agreement to build and launch CBERS-2B by 2006 in order to replace CBERS-2 and thereby guarantee the continuous supply of remote sensing data. As with any emergent technology, remote sensing monopolies have deterred global development. The CBERS data provides new hope for world economic growth through self-sustaining commercialization of the images to third parties, without neglecting a commitment to free access when China and Brazil agreed to the need. This paper presents the criteria for commercializing CBERS data and its role in Chinese and Brazilian joint research and development in remote sensing. As is well known, Brazil has long defended the revision of the 1986 UN Principles on Remote Sensing in the COPUOS[3] Legal Subcommittee, which haven proven to be ineffective in dealing with current issues. The Brazilian proposal was not ever approved, primarily because developed countries were afraid that the revision of those Principles might jeopardize their commercialization of remote sensing data and, consequently, reduce the profits of their private companies. An explanation of Brazil's current position on reform issue in the COPUOS Legal Subcommittee is presented in this paper along with current status of Brazilian legislation and the need of an improved legal framework in remote sensing.

BACKGROUND

In the 47th Colloquium on the Law of Outer Space[4], held in Vancouver, Canada, in 2004, the paper "Evaluation of Space Cooperation Between China and Brazil: An Excellent Example of South-South Cooperation", written by Prof. Yun

Zhao, Lecturer of the City University of Hong Kong was presented.

Tracing the history of cooperation between China and Brazil, Prof. Zhao noted that "*Brazil is among one of the earliest countries to have cooperative projects with China. CBERS project, set up in 1986, was jointly financed by China and Brazil. And the Protocol on Research and Production of the Earth Resource Satellite was signed by both Governments in 1988. However, the first consequence of the Protocol came only after eleven years when the CBERS-1 was launched in 1999 from the Chinese base in Taiyuan. It was China's first generation transmition earth resources satellite developed by China and Brazil (...) In view of such joint creative work, both parties were able to reach further cooperative protocol in 2002. Soon after, CBERS-2 was launched from Taiyuan in October 2003...*"

On May 24, 2004 China and Brazil signed a Memorandum of Understanding to extend the scope of the CBERS Program, in order to establish the criteria for commercializing CBERS data. As a result of that Memorandum, a new Protocol was signed on November 12, 2004, defining the goals of CBERS application systems, including the commercialization of CBERS products to third countries through joint projects. The Chinese National Space Administration – CNSA – and the Brazilian Space Agency – BSA -were chosen to implement the activities determined in the Protocol. Another Protocol dealing with the launching of CBERS-2B by 2006 was also signed on the same date.

The schedule for CBERS satellite launchings is: CBERS-2B by 2006; CBERS-3 by 2008; and CBERS-4 by 2010.

THE 2004 PROTOCOL

According to the Protocol signed on November 12, 2004, hereinafter called "the Protocol", China and Brazil have agreed to:

a) establish the requirements for tasks, functions, and specifications of the application system's infrastructure;

b) consolidate the technical organization of the application system's infrastructure; and

c) define a plan for developing and producing an application system that shall privilege Chinese and Brazilian companies.

A cooperation program to develop software for a reception and processing system for CBERS data for use by other countries was also established in the Protocol.

China and Brazil have agreed to:

a) develop and improve software for CBERS data application and for generating products for end users;

b) organize meetings for exchanging experiences regarding CBERS data;

c) promote technical exchange of CBERS data among users from China, Brazil, and other countries;

d) establish and implement criteria and patterns for evaluating CBERS products; and

e) promote and summarize discussions of feedback from users in order to improve CBERS sensors and then propose new onboard sensor technical requirements.

The Protocol states that disputes and doubts regarding its terms will be solved through mutual consultations between China and Brazil. It also states that questions related to intellectual property will be established in specific agreements which will take into account

the national legislation of both parties and international rules accepted by them.

The Protocol will remain valid for five years and will be renewed automatically for successive periods, unless a party notifies the other within six months in advance that it wishes to terminate the agreement.

Both parties have also agreed to distribute CBERS products according to the conditions established in the document "CBERS Data Policy" which is an annexed and integral part of the Protocol.

CBERS DATA POLICY

"CBERS Data Policy" is annexed to the Protocol. It establishes the policy for commercializing CBERS data and includes provisions for receiving, processing, and disseminating CBERS images to countries other than Brazil and China.

According to the document, CBERS images will be made available to any country or organization through a network of licensed representatives operating an application system which can receive and process the CBERS data.

International ground stations will not have access to the onboard data recorder (OBDR), which will be operated exclusively by CRESDA[5] and INPE. Each ground station will receive raw data only for specific regions as determined by contract and will then process it into image products, which will then be distributed to users. The licensing of CBERS data downlinks will be based on fees which are charged on a per-minute basis. Distribution of CBERS images to third parties will be done solely on the basis of the international price list, as agreed to by China and Brazil. China and Brazil may, in a few special cases, upon mutual consultations, decide on the transfer of data free of charge.

Brazil has had just 30% of participation in the CBERS budget[6], but, in spite of that, the revenues resulting from the distribution of CBERS data will be equally shared between China and Brazil. Moreover, ground stations operated by INPE in Brazil and by CRESDA in China will have unlimited access to all data collected within their footprint.

The following guidelines regulate the use of the OBDR:

a) The number of hours monthly available for OBDR will be established periodically by the engineering teams of CBERS. INPE and CRESDA will equally share the available time, i.e., 50% to CRESDA and 50% to INPE, on a non-cumulative basis, so unused hours in a month cannot be accumulated for subsequent periods;

b) Images stored in OBDR will be downloaded at the Brazilian and Chinese ground stations;

c) Data downlinks to ground stations will have priority over the use of OBDR, except in the case of emergency situations, as determined by INPE and CRESDA.

The interface between satellite and ground station is regarded as intellectual property of INPE and CRESDA and will not be disclosed to third parties unless agreed to in writing by both parties. INPE and CRESDA will encourage Brazilian and Chinese companies to act as suppliers of components and equipment for CBERS application system infrastructure.

As for Chinese and Brazilian ground stations, each party is free to decide on its own development strategy that will preferably be carried out only by national companies. The parties agree that any component of the ground station that

cannot be built by its national industry will first be requested from the other partner, before any contracts are placed in the international market.

The document also deals with the licensing policy for international ground stations. The licensed representative will commercialize CBERS data downloaded to ground stations based on an annual fixed fee, to be determined by INPE and CRESDA. This commercial strategy is the same as the one adopted by the United States Geological Survey – USGS – the American company that commercializes Landsat satellite data. The annual fee will be determined by the conditions of the ground stations, including geographical location and tracking system footprint.

The licensed representatives shall hold annual meetings with their customers and promote the diffusion of any news and decisions regarding CBERS.

Finally, the document establishes terms and conditions for commercial agreements between licensed representatives and CBERS data distributors. It establishes that images distributed within the distributor's national market may not be exported abroad.

CURRENT EXPERIENCE

Since China and Brazil have autonomy for establishing their own policy for distributing CBERS data within their territories, Brazil, through its Ministry of Science and Technology, has decided to distribute CBERS data free of charge to Brazilian users during an initial period of two years. Both parties had agreed that, during such an experimental phase, CBERS data could not be distributed to foreign States or people, or even to nationals living abroad.

The CBERS site on the Internet was opened experimentally in April, 2004, but it was officially inaugurated on June 15, 2004[7], through an announcement of the Brazilian Ministry of Science and Technology.

The decision to distribute CBERS data free of charge has popularizated its use as a tool among Brazilian users. Brazilian remote sensing companies have also been improving their products and services due to the easy access to CBERS data.

On June 17, 2005, just one year after the inauguration of the CBERS site, INPE celebrated the distribution of 100,000 CBERS-2 images for Brazilian users. Just as a comparison, the French Spot-5 satellite, for instance, provides around 20,000 images per year; and the North American Landsat satellite provides around 12,000 images per year. According to the registry controlled by INPE, there are currently over 12,000 CBERS data users. The average of requests for CBERS-2 data is over 3,000 per month, and over 10,000 images are downloaded monthly.[8]

The demand for CBERS-2 images can be divided as follows: 25% from Brazilian governmental entities; 25% from Brazilian Universities; and 50% from the private sector, including companies and individuals[9].

In 2005 at the XII Brazilian Symposium on Remote Sensing, more than 70 papers involving the use of CBERS data were presented[10].

However, on April 13, 2005, CBERS-2 satellite presented technical problems[11]. One of its two batteries stopped working. Since then, this failure has been interfering directly in data provided by CBERS, especially when its solar panels are not receiving sunlight. Due to this problem, Brazil has decided to

keep providing CBERS-2 data free of charge up to the launching of CBERS-2B, which is scheduled for October, 2006. So, the policy for commercializing CBERS data will only go into effect after the launching of CBERS-2B.

"CBERS DATA POLICY" IN ACCORDANCE WITH THE 1986 UN PRINCIPLES ON REMOTE SENSING

The document "CBERS Data Policy" establishes that international ground stations will not have access to OBDR, which will be operated exclusively by CRESDA and INPE. The document emphasizes that images distributed within the distributor's national market may not be exported abroad. This policy is in accordance with the provisions of Principle IV of the 1986 UN Principles on Remote Sensing.

The document foresees that, in a few special cases, China and Brazil may, upon mutual consultations, decide on the transfer of data free of charge. So, it is probable that some developing countries and academic and scientific institutions will receive CBERS data free of charge for a certain period of time. It is expected that as users become more economically competitive through the use of this tecnology, they will eventually develop the economic capacity to pay a reasonable price for the images. This policy is in accordance with Principles II and XII of the 1986 UN Principles on Remote Sensing.

International cooperation is also a concern of the "CBERS Data Policy", because China and Brazil are committed to developing CBERS application system infrastructure in other countries. This policy is accordance with Principles V, VI, VII, and XIII of the 1986 UN Principles on Remote Sensing.

It may, therefore, be concluded that the document "CBERS Data Policy" is in accordance with the 1986 UN Principles on Remote Sensing.

BRAZIL'S POSITION IN THE COPUOS LEGAL SUBCOMMITTEE

In 2002, Brazil proposed a discussion regarding the revision of the 1986 United Nations Principles Relating to Remote Sensing of the Earth from Outer Space[12]. In its original version, the proposal established the possibility of implementing a single convention on remote sensing because the 1986 UN Principles were deemed no longer effective in dealing with the current state of affairs.

In 2004, at the beginning of the 43rd Session of the COPUOS Legal Subcommittee, Brazil agreed to change its proposal to a mere discussion of the feasability of updating the 1986 UN Principles on Remote Sensing in response to requests from other delegations. At the end of the Session, Brazil's proposal was modified once again to a simple analysis of national practices on remote sensing. Although the last version was supported by the majority of the delegations, including the States that belong to the European Space Agency, it was not possible to overcome the objections made by the North American and Japanese delegations and the proposal was not adopted.

In 2005, during the next Session of the COPUOS Legal Subcommittee, Brazil decided to withdraw its proposal regarding the 1986 UN Principles on Remote Sensing, because it was obvious that a consensus could still not be reached.

Mr. Carlos Eduardo da Cunha Oliveira, the head of the Brazilian Delegation in the 44th Session of the COPUOS Legal Subcommittee, explained Brazil's reasons for withdrawing its proposal and Brazil's current position.

He reminded delegates that Brazil had participated in the period of discussions that led to the approval of the 1986 UN Principles on Remote Sensing and that Brazil continued to abide by them. Other countries had joined Brazil in requesting the COPUOS Legal Subcommittee to analyze national practices related to remote sensing to enforce the 1986 UN Principles.

He made it clear that the Brazilian proposal of 2004 had never attempted to subvert these Principles as demonstrated by the document "CBERS Data Policy" which was written in accordance to them.

He emphasized that the compliance with the question of providing better access to the benefits associated with the use of remote sensing technologies was not devoid of interest to the work of the Subcommittee, especially with regard to disaster prevention and mitigation.

He reassured delegates that Brazil remained committed to the development and dissemination of remote sensing applications. Brazil had proved the value of initial free access as provided to Brazilian users as a means of national development.

Finally, he nonetheless noted that current Principles or even new ones were not totally incompatible with commercialization and private enterprise. But without full support from the developing world and cooperation from all members of the Subcommittee, Brazil considered that it was not the appropriate time to pursue the proposal. Chile and Colombia disagreed with such a decision and will re-present a proposal regarding remote sensing issues at the next session.

BRAZILIAN NATIONAL LEGISLATION ON REMOTE SENSING

Remote sensing activities in Brazil are regulated by Decree # 2.278, of July 17, 1997.

Actually, the Decree does not deal with remote sensing activities, but with aerial photography, i.e., pictures of a terrestrial area taken from planes.

According to the Decree, remote sensing activities are wrongly treated as aerial photography, the unique difference is the place where the sensor is installed: in a plane or on a satellite.

Due to this misapplication of the law, the Decree contains dispositions which are inappropriate. For instance, to undertake remote sensing activities in Brazil, a company should get an authorization from the Brazilian Ministry of Defense. However, as is well known, technically speaking, such an authorization is not effective, because there is no way to avoid remote sensing surveillance; any State is a potential sensed State.

In practice, Decree # 2.278/97 has not been considered by the Brazilian companies that carry out remote sensing activities, and its dispositions have been restricted to aerial photography activities. Notwithstanding, it is officially valid, so it should be updated immediately, in order to limit its scope to aerial photography.

Around five years ago, the Brazilian Space Agency started efforts to implement specific legislation regarding remote sensing, and to update Decree # 2.278/97 as well. A work group composed by members of the Brazilian

Ministry of Defense, Ministry of Foreign Affairs, and Ministry of Science and Technology was created. However, since consensus was not reached, work was interrupted.

Taking into account the current status of remote sensing activities in Brazil, the debates which were started by the Brazilian Space Agency should be reinitiated in order to develop sound, comprehensive, national legislation.

SOME REMARKS

Although the United Nations has encouraged international cooperation in space activities, it should be noted that developing countries have been facing obstacles in establishing agreements with developed countries, especially in remote sensing. According to INPE's General Coordinator of Earth Observation, Dr. Gilberto Câmara, "*the current trend in developed nations is to consider that their countries' taxpayers should not subsidize the use of spatial data by the developing nations. Therefore, such nations are increasingly dealt with as customers of the developed countries' commercial sector*"[13].

Since cooperation between developed and developing countries faces such obstacles, cooperation between developing countries that carry out space activities seems to be the best solution. The agreement that Brazil has signed with China may be considered a good example of such cooperation.

The Brazilian decision to initially provide CBERS data free of charge correctly emphasized that public interest should prevail over private. The incredible number of CBERS images that has been accessed by Brazilian users in just one year – 100,000 – shows the importance of remote sensing activities for developing countries. Prof. José Monserrat Filho has noted that: "*The easy access to CBERS data and the benefits derived from the continuous use of satellite images have already brought and still will bring social and cultural consequences (...) Due to the wide distribution of CBERS data, the Brazilian space program shows, finally, its value and utility and has become a concrete reality for a growing number of Brazilians*[14].

Taking into account its current technological status, Brazil needs specific national legislation to regulate remote sensing activities.

References

---

[1] CBERS-2 was launched on October 21, 2003.
[2] China-Brazil Earth Resources Satellite
[3] Committee on the Peaceful Uses of Outer Space
[4] This Colloquium is annually organized by the International Institute of Space Law (IISL).
[5] Chinese Center for REsource Satellite Data and Applications
[6] The costs of CBERS Program are estimated in US$ 300 millions.
[7] See www.obt.inpe.br/catalogo
[8] Data provided by José Monserrat Filho in his paper "CBERS: Satellite Images for Giving and Selling".
[9] Data provided by Mr. Jose Carlos Neves Epiphanio, INPE's Manager of CBERS Application System.
[10] See www.ltid.inpe.br/sbsr2005
[11] Information provided by Mr. Janio Kono, INPE's Manager of CBERS Program.
[12] The Principles were approved by the United Nations General Assembly Resolution # 41/65, on December, 9, 1986.
[13] In his paper "Frameworks for Sustainability of GIS and Earth Observation Technologies in Developing Countries", presented at the 18th International CODATA Conference, Montreal / Canada, October 2002.
[14] In his paper "CBERS: Satellite Images for Giving and Selling", available on the site www.sbda.org.br