THE DEVELOPMENT OF FINANCING OF SPACECRAFT

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Abstract

When in 1958 the first Colloquium took place in The Hague, the construction of spacecraft was still in its infancy. The only states, which where involved, the United States and the Soviet Union, were paying for their own expenses. Since then not only the construction of spacecraft but also the financing of it has gone through a big development so that now all kind of financial cooperation taking also the form of leasing has come into being.

Introduction

At this Colloquium we are (re)considering the History and Development of Space Law.

With Dr. Eilene Galloway, Prof. A. Cocca and Prof. S. Gorove I am one of the surviving participants of the first Colloquium on the Law of Outer Space, held in The Hague in 1958 in one of the rooms of the prestigious Knights Hall, where the Queen of the Netherlands has the custom of opening the new year of the Parliament.[1]

Dr.Haley was the President and Dr. Pépin and I were Vice-Presidents.

Then I spoke about the responsibility of States for the damage caused by launched space-bodies but today I would like to say some words about the developments related to financing of spacecraft.

In 1958 only the United States and the Soviet Union were active participants in space constructing satellites, each paying for the expenses of their own activities. In later years the United States stressed the importance of the Shuttles and the Apollo plan, the Soviet Union giving their attention to the construction of the space station Mir, till now the only space station in action.

With the development of satellites and in addition the more and more complicated construction of space engines, while outer space commercial activities such as the development of information technology and the great demand of telephone services are increasing, cooperation in the field of financing also became more and more necessary.

Means of financing

In their book Astrobusiness, Finch and Moore cite a scheme of Raeder mentioning as financial sources corporations, banks, institutions, venture funds, individuals[2] and the public market.

Space cooperation in the field of financing can be realized by governmental agreements, memorandums of understanding and individual contracts. In the USA the Federal Communications Commission (FCC) which was established in 1934 by the Communications Act, serves as licensing authority for communications satellites.[3]

One of the first Agreements between the USA and Europe was already concluded in 1973 between NASA and ESRO. Besides scientific cooperation one of the keynote provisions is 'no exchange of fund' rule according to which each partner is financially responsible for project elements it develops.[4]

Cooperation in Europe

In Europe there is a cooperation between States in the European Space Agency (ESA). ESA has been founded in 1975 and the ESA Convention is in force since 30 October 1980. 'The ESA Convention provides that member—States have to vote for the level of resources for a five-year period, a level which is reviewed after three years, in order to carry out ESA's mandatory activities, namely the ones relating to the general budget and to the scientific program.'[5]

'The Ministers established a Council working group responsible for reviewing the tables establishing a ceiling for common operation costs, allowing Partners to plan in the longterm and with a certain accuracy their financial responsibilities based on fair contribution.'

There are also optional and operational activities. The states are free to participate in optional activities contributing also in the costs, whereas operational activities are effectuated for the requirements of other organizations as f.i. for Arianespace.

Transfers of responsibility have taken place between Eutelsat, Eumetsat and Arianespace.[6]

Before ESA, there was some scientific cooperation between its predecessors, the European Space and Research Organization (ESRO) and the European Organization for the Development and Construction of Space Vehicle Launchers (ELDO) but with the creation of ESA not only scientific research but also financing found a good base. Funding levels are approved by ESA's sovereign legislative council. Individual national space organisations are funding specific ESA spacecraft.

Farand observes that 'ESA's energies also concentrated on negotiations, formally begun in April 1994, to bring Russia into the Association of Partners. These negotiations are complex.'[7]

As 'for example Europeans are demanding the adoption of rules allowing a Partner to pay its portion of the common exploitation costs in goods and services it produces itself thereby reducing to a minimum the exchange of funds between interested parties and rules for the calculator of contributions used to finance ESA's mandatory activities and asked the Director General to elaborate proposals based on the group's conclusions for the implementation of appropriate measures as of 1 January 1997.' After a transition period running from 1997 to 1999, during which contributions in national currencies will continue on a decreasing basis, member States will have to pay their entire contribution in ECU.

Space Station

The Space Station project is a striking example of international cooperation. In 1982 discussions started between NASA's Space Station Task Force, USA, the Canadian Ministry of State and Technology, Europe (ESA) and Japanese experts for a construction and cost sharing of an International Space Station and lead to the Memorandum of Understanding in 1988. As Focke mentions, the legal instruments for this cooperation took about three years to be concluded.[8]

In Article 15 of the Intergovernmental Agreement, concluded on 29 September 1988 (into force on 30 January 1992) the funding has been regulated. The basis is to be found in Paragraph 1 whereas the other four paragraphs elaborate the financial obligations. Paragraph 1 states 'Each Partner shall bear the costs of fulfilling its respective responsibilities under this Agreement, including sharing on an equitable basis the agreed common system operations costs or activities attributed to the operation of the Space Station as a whole, as provided in the MOUs and implementing arrangements'.

In an Annex has been mentioned for which activities of the space station each Partner will provide.

Article 24 entitled: Space Station Cooperation Review states that 'In view of the long-term, complex, and evolving character of their cooperation under this Agreement, the Partners shall keep each other informed of developments which might affect this cooperation. Beginning in 1999, and every three years thereafter, the Partners shall meet to deal with matters involved in their cooperation and to review and promote Space Station cooperation'.[9]

General Cooperation

To stimulate the international cooperation and exploration and use of outer space the United Nations delivered a Declaration[10] in which Item 5 says: 'International cooperation while taking into particular account the needs of developing countries, should aim, inter alia, at the following goals, considering their need for technical assistance and rational and efficient allocation of financial and technical resources: Promoting the development of space science and technology of its applications, fostering the development of relevant and appropriate space capabilities in interested States, facilitating the exchange of expertise and technology among States on a mutually acceptable basis.'

Industrialised countries do provide considerable amounts of money for building satellite utilization capacities in developing countries, especially in the field of telecommunications and remote sensing activities.

Most cooperation is to be found in the field of telecommunication and in international launching activities. Therefore international agreements were necessary to establish institutions for specific operational space functions as Intelsat, Inmarsat, Arabsat and Eutelsat.

Although governments bear the large fixed costs of developing launch systems, some companies may incur significant costs for expension of production capabilities beyond those established by the government, replacement of worn-out tooling equipment and buildings; and improvements to existing vehicles and launch infrastructure. General Dynamic reports that it has invested more than US$ 400 million in upgrading its commercial and military Atlas programs. Governmental needs related to space actitivites could hamper commercial needs.

Financing in Organisations

It is interesting to see how the financial contributions of the States are incorporated in the operating agreement relating to the International Telecommunications Satellite Organisation (Intelsat).[11] In Article 4 it is determined that 'each Signatory shall make contributions in proportion to its investment share as determined pursuant to Article 6 of this Operating Agreement and shall receive capital repayment and compensation for use of capital in accordance with the provisions of Article 8 of this Operating Agreement.' Intelsat is in force since 12 February 1973.

Inmarsat (Convention of the International Maritime Satellite Organisation), in force since 16 July 1976, has stated in article 5 that each Signatory shall have a financial interest in the Organization in proportion to its investment share which shall be determined in accordance with the Operating Agreement.[12]

Arabsat (Arab Corporation for Space Communications) is in force since 16 July 1976. In this agreement has been stated that the contribution by the Member States to the capital of the Corporation shall be in accordance with the proportions set out in the appendix attached to this agreement.[13]

Eutelsat (European Telecommunication Satellite Organization) is an international organization based on an intergovernmental convention to which all European states can accede. It has the same regulation as Intelsat. Article 5C states: 'Each Signatory shall have a financial interest in Eutelsat in proportion to its investment share and this shall correspond to its percentage of all utilization of the Eutelsat Space Segment by all Signatories as determined under the Operating Agreement. However, no Signatory, even if its utilization of the Eutelsat Space Segment is nil, shall have an investment share less than the minimum investment share specified in the Operating Agreement.'[14]

Eumetsat (Exploitation of Meteorological Satellites) is in force since 19 July 1986. Eumetsat is an international organization based on an intergovernmental convention to which all European states can accede. The expenditure of Eumetsat shall be covered by the financial contributions of the Member States and by any other Eumetsat income (art. 9).[15]

The International Telecommunication Union (ITU) is a very important organization.[16] As Lyall observes 'the original purposes of the ITU were first technical specification, standards, compatibility and intercommunication and second, question of rates for communications.' The third purpose was to help development in countries not able to provide for telecommunications themselves. These purposes are represented in three sections.

The membership as big 'M' member of ITU can only be obtained by States. The abovementioned organizations (Inmarsat, Intelsat, etc.) are not allowed to participate. The ITU has a scale of units to regulate their finances.

The members elect the class of contribution they want to make. Although Lyall has no objections against this method of financing itself, he points out that the discrepancy between the conventional highest unit class and the minimum unit class is too big. Moreover he states that more than 80% of the ITU budget is contributed by less than 10% of its members but that every member has one vote.[17]

UNCOPUOS

Of course as a form of international cooperation has to be mentioned also the Uncopuos (United Nations Committee on the Peaceful Uses of Outer Space) established in conformity with Art. 2, section 1 of the UN Charter.[18]

Based on UN resolutions the Treaty of 1967 emerged and was followed and elaborated by four other Treaties and three Resolutions on Principles on practical appliations.[19]

However none of these regulations does contain provisions on financial means.

Launch Services

Prior to the 1980's the US Government was essentially the only provider of space launch services to the western world. In 1979 the Ariane (European satellite) had been launched. Pursuant to the Commercial Space Launch Act the US President established an office within the Department of Transportation dedicated to commercial space transportation.[20]

Competition between the US Government and Arianespace had driven prices down to levels where private US launch companies had difficulties to compete. Commercial launch markets were encouraged to compete with Arianespace.

Competition takes also place with the launching vehicle Long March in China which delivers services rather cheaply.

As Gabler observes 'Terms affecting prices of launch services need to be considered in light of the payment and financing terms attached to it.'[20]

Payments for launch goods and services are almost always made in cash usually in US dollars. Lower European interest rates enable Arianespace to compete against the US Shuttle. Financing for launches is usually arranged through commercial lending channels. Export-import loan guarantees can be arranged through national governments.

Nesgos mentions that also a number of national projects have been supported by export financing such as Brazil's Brazilsat, Mexico's Morelos and Indonesia's Palapa telecommunications satellites.[21] Business of space insurance has been almost exclusively involving communications satellites which operate in geostationary orbit. According to Nesgos the fact that debris in this area are relatively scarce is the cause that 'debris has not had a material adverse effect on the placement of insurance'.[22]

According to Space News France and Japan are with the United States, Russia, China and India important space powers, each investing the equivalent of about $ 2 billion annually in space programs.[23]

The United States

In the United States the space policy is the task of the Government. Regarding communications the Communication Act of 1934 (revised by the Telecommunications Act of 1996 which made no significant change on Telecommunications satellites) and later the Communication Satellite Act of 1962 are applicable whereas also the Federal Communication Commission is supervising the activities of these satellites. This Commission provides also rules for the owning and operating of telecommunications satellites.

The NASA Act of 1958 provides for the transportation and manufacture sector.

US Launch services are covered by the Commercial Space Launch Act of 1984. Remote Sensing is regulated by the Land Remote Sensing Commercialisation Act of 1984 and by bilateral agreements whereas on 28 October 1992 US President Bush signed the Land Remote Sensing Policy Act.[24]

As an illustration of the bilateral approach the Landsat agreements may best be taken as an example.[25] These are agreements concluded between the National Aeronautics and Space Administration (NASA) of the USA and a number of countries spread over the world: Argentina, Australia, Brazil, Canada, India, Italy, Japan and Sweden. For those countries, the agreements involve the building of ground stations for the acquisition and processing of SRS data, at their own expense. The authority for NASA to enter into such agreements derives from the NASA Act of 1958, which provides 'that activities in space should be devoted to peaceful purposes for the benefit of all mankind', while Section 205 of that Act empowers NASA to 'engage in a program of international cooperation in work done pursuant to this Act, and in the peaceful application of the results thereof'. In addition to each country paying for its own share in the project, it is also agreed under Landsat arrangements that data obtained from experiments will be made available to the international scientific community. Besides, countries without Landsat facilities but within range of the ground stations will be served with information.

The Land Remote Sensing Policy Act of 1992 is a compromise between several views which have been expressed along the years, since the Land Remote Sensing Commercialization Act of 1984 concerning the operation of the US Landsat Program.[26]

Russia

The Law of the Russian Federation on Space Activities gives in Section III, Article 12 some rules about Financing Space Actitivies and Foreign Investment:

'1. The financing of space activities for scientific and national economy purposes shall be realized within the republican budget of the Russian Federation in acordance with the Federal Space Program of Russia, and figured in the republican budget of the Russian Federation as a separate item. The financing of space activities for the purpose of defense and security of the Russian Federation shall be provided by the republican budget of the Russian Federation as part of defense expenditures.

2. Space activities shall be financed from the republican budget of the Russian Federation in a purpose—oriented manner through state customers for works to create and use space technics, and shall be distributed between contractors in accordance with state contracts. The state customer and the contractor shall have the right to resort to non-budget sources of financing, including their own resources, provided this does not contradict the objectives of the space project.'[27]

The only US contribution is for a special project as e.g. for Mir.

China

China is a developing country with limited funds. Its investment into space technology is low. But the development of China's space technology has its own characteristics and the Long March is now again rather successful.[28]

Asia

In Asia, the Palapa System of Indonesia is well known, whereas India was also one of the first countries which used space activities as telecommunications and remote sensing for the education of its extensive population. As Kosuge mentions 'In 1992, Palapa offered the ASEAN countries satellite coverage of Japan, Korea, Taiwan, Hong Kong, the Pacific Islands and coastal China. The Palapa system itself has plans to expand its network further over the next five years to add new services including VSATs. Palapa will be subject to competition from a consortium comprising an Indonesian company, PT Mediacitra Indostar and International Technologies, who intend to launch a satellite, Indostar 1, which will provide TV and radio services throughout Indonesia.'

A combination of companies also launched in 1990 the Asiasat I satellite which is positioned over Indonesia and cover India, Pakistan, Thailand, Malaysia, all of China, Japan, Mongolia, Korea, the former Russian republics, and even into the Middle East.[29]

Australia

As Johnson-Freese observes 'In the 1960s, Australia was one of the world's leading nations in space research. Not only was it the third country to launch a scientific satellite from its own territory, Australian scientists were also deeply involved with experimental projects. But when the United States and ELDO stopped using the Woomera launch site in the early 1970s, Australian politicians seemed quickly to lose interest in funding further space activities.'[30]

In the mid-1980s, the State of Queensland had some interest to enable several companies under which the Martin Marietta corporation to build a space port and to finance support structures. Till now plans seem not to have been realized but new activities are in the making.

South America

As Monserrat Filho observes a New Brazilian Space Agency has been established in 1994.[31] There is some cooperation in South America for instance between Brazil and China.[32]

Conclusion

Our conclusion is that the financial means are organized and obtained now by national and international measures. Cooperation has become a necessity and will increase more and more, given the fast development and the complexity of space activities and the limitation of economic resources which have to be found in public as well as in private sources.

Notes

1. Proceedings 1st Colloquium on the Law of Outer Space, (The Hague, 1958).

2. E.R. Finch Jr. and A.L. Moore, Astrobusiness, A Guide to the Commerce and Law of Outer Space, 1985, p. 51 et seq. See for more information K.J. Madders and W.H. Thiebaut, 'Two Europes in One Space: the Evolution of Relations Between ESA and the EC in Space Affairs', Journal of Space Law, Vol. 20 (1992), pp. 117-132.

3. P.L. Meredith, 'A Comparative Analysis of US Domestic Licensing Regimes for Private Commercial Space Activities', Proceedings 32nd Colloquium on the Law of Outer Space, (Malaga, 1989), pp. 373-381.

4. E. Sadez, J.P. Lester and W.Z. Sadez, 'Modeling International Cooperation for Space Exploitation', Space Policy, August 1996, pp. 297-223, at p. 216.

5. See for text of the Convention for the Establishment of European Space Agency, N. Jasentuliyana & R.S.K. Lee, Manual on Space Law, Vol. II, 1979, pp. 259-289.

6. G. Lafferranderie, 'The European Space Agency - Present and Future', Proceedings of the 38th Colloquium on the Law of Outer Space, (Oslo, 1995), pp. 189-198, at p. 196-197.

7. A. Farand, 'Recent Developments at the European Space Agency', Annals of Air and Space Law, 1996, Vol. XXI, Part II, pp. 371-381.

8. K. Focke, 'International Cooperation in Space - Legal Aspects for the Future', Proceedings of the 33rd Colloquium on the Law of Outer Space, (Dresden, 1990), pp. 192-194.

9. See for the text of this agreement Proceedings of the Colloquium on Manned Space Stations - Legal Issues, (Paris, 7-8 November 1989), ESA SP-305, ISBN 92-9092-062, January 1990.

10. UN Doc. A/AC105/L211 of 11 June 1996. See also M. Benkö and K.-U. Schrogl, 'The 1996 UN Declaration on "Space Benefits" ending the North-South Debate on Space Cooperation', Proceedings 39th Colloquium on the Law of Outer Space, (Beijing, 1996), pp. 183-186.

11. See for text of this agreement N. Jasentuliana & R.S.K. Lee, Manual on Space Law, Vol. II, 1979, pp. 216-238.

12. See for text of this agreement N. Jasentuliana & R.S.K. Lee, Manual on Space Law, Vol. II, 1979, pp. 291—344.

13. See for text of this agreement N. Jasentuliana & R.S.K. Lee, Manual on Space Law, Vol. II, 1979, pp. 345—362.

14. See S. Courteix, 'EUTELSAT': Europe's Satellite Telecommunications' in: Regulation of Transnational Communications, European Perspectives, Michigan Yearbook of International Legal Studies, 1984, pp. 85-101.

15. See M.G. Bourely, 'EUMETSAT - A New European Space Organization for Cooperation in the Field of Meteorology', Proceedings of the 26th Colloquium on the Law of Outer Space, (Budapest, 1983), pp. 195-196.

16. F. Lyall, 'The International Telecommunication Union Reconstructed', Proceedings of the 36th Colloquium on the Law of Outer Space, (Graz, 1993), pp. 78-88. See also for the History F. Lyall, ibidem, p. 78 a.f.

17. F. Lyall, 'The Role of the International Communication Union', in: Outlook on Space Law over the Next 30 Years, (G. Lafferranderie and D. Crowther, eds.) 1997, pp. 253-267.

18. Resolution No. 1348 (XIII) of 13 December 1958.

19. F. von der Dunk, 'The Undeniably Necessary Cradle - Out of Principle and Ultimately Out of Sense', Outlook on Space Law over the Next 30 Years, (G. Lafferranderie and D. Crowther, ed.) 1997, pp. 401-414.

20. E. Gabler, 'Product and Service pricing: Launch Vehicles in Space Economics', Progress in Astronautics and Aeronautics Space Economics (J.S. Greenberg and H.R. Hertzfeld, eds.), 1992, pp. 263-293.

21. P.D. Nesgos, 'Commercial Space Law - Practical Examples Relating to Contracts, Insurance and Finance', Proceedings 37th Colloquium (Jerusalem, 1994), pp. 305-314.

22. Ibidem.

23. P.B. de Selding, Space News, 2-8 June 1997, p. 5.

24. P. Salin, 'The New Landsat Set of Regulations as per the Land Remote Sensing Policy Act (1992)', Issues in International Air and Space Law, and in Commercial Law (Essays in Commemoration of Prof.Dr. Doo Hwan Kim's Sixtieth Birthday), 1994, pp. 355-364.

25. See E. Galloway, 'Remote Sensing from Outer Space: Legal Implications of Worldwide Utilization and Dissemination of Data', Legal Implications of Remote Sensing from Outer Space, Proceedings of a Symposium (Montreal, 1975), N.M. Matte and H. DeSaussure, eds., pp. 91-104 at p. 91 a.f.

26. See Salin, op.cit., note 24, supra.

27. The text that is used is the English translation contained in the ESALEX database with the European Space Agency in Paris, accessible by Internet or modem; slightly revised as to grammatical aspects and lay-out.

28. Zhu Yilin and Xu Fuxiang, 'Status and Prospects of China's Space Programme', Space Policy, February 1997, pp. 69-76.

29. T. Kosuge, 'Satellite Communications Systems and Legal Issues in the Asia-Pacific Region', Issues in International Air and Space Law, and in Commercial Law (Essays in Commemoration of Prof.Dr. Doo Hwan Kim's Sixtieth Birthday), pp. 305-316.

30. J. Johnson-Freese, Changing Patterns of International Cooperation in Space, 1990, (Orbit series) at p. 71-77.

31. J. Monserrat Filho, 'The New Brazilian Space Agency (AEB): a Political and Legal Analysis', Proceedings 37th Colloquium on the Law of Outer Space, (Jerusalem, 1994), pp. 262-267.

32. J. Monserrat Filho, 'Brazilian—Chinese Space Cooperation: An Analysis of its Legal Performance' Proceedings of the 39th Colloquium, (Beijing, 1996), pp. 164-175.