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GUARANTEED ACCESS TO SPACE: EXTENSION TO COUNTRIES WITHOUT LAUNCHER?

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ABSTRACT:

Space fairing nations have always been looking after a guaranty for access to space, in an independent or sovereign way, initially motivated by prestige, military and science interests. This is also verified now for the new countries joining the space arena. But without owning their launcher they cannot really profit from freedom of access to space as guaranteed to all States by the Outer Space treaty.

In this context, this paper addresses two main questions: Could a *space emerging nation* that does not possess a launcher consider itself as having a guaranteed access to space, by means of an Intergovernmental Agreement? And what could be the motivations of a *space fairing nation* in having such agreement?

INTRODUCTION*

The title of this article is somehow provocative in asking how countries without having their own developed launcher could profit in a sovereign way from the free access to space given by the Outer Space Treaty[13]. The geopolitical world scene seems to evolve towards increased cooperation among states, while the space launcher's developments slowly quits the domain of national sovereignty and prestige to evolve towards a service-oriented approach, shared today between public and private investments and operations[14].

This article can be seen as the first of a series, trying to initiate a wide discussion on this subject, later reporting on the progresses made in understanding all elements of it and hopefully one day drafting an agreement proposal.

BACKGROUND

Outer Space Conquest and First Treaties

At the time the Outer Space treaties were discussed, space activities were mainly concentrated in only two nations. In the facts the treaties involved much more nations, and one point of view is to say that the other nations, while not expecting any space activity or launcher developments in a close future, they were interested in safeguarding their access to space for the future[37] and also restricting weaponisation.

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Therefore, from the point of view of the space access, the Outer Space Treaties requested the two space-racing nations to share their newly conquered space while not sharing the transport means. This seamed to have been acceptable to all parties, safeguarding their present and future interests.

Securing Access to Space

The Outer Space treaty gives a guaranteed *freedom* of access to space to all States, that they cannot really profit without owning their launcher.

The space fairing nations, those from the space-race and those emerging later, have always been looking after a guaranty for access to space, in an independent or sovereign way: their space developments were initially motivated by prestige, military and science interests and a secured access to space was then seen as a key element[15].

Even today, some of the countries showing an increasing role in space applications and substantially investing in space developments seems to find a need for developing a launcher[34], despite the huge cost and risk when compared to the very low economic and application return, at least initially[24][18][19]. Certainly some countries find (or found) a synergy with their military developments of missiles[29], but this cannot be the only justification of these highly risked investments when compared with the return of a similar investment in space focused for example on science, telecommunication or environmental satellites[16][17][30][31].

Therefore one can say that for "space emerging nations", owning a guaranteed access to space is seen as a necessary condition to be recognised among the "space fairing nations", possibly expecting to become one of them later.

Some exceptions exist, however, and possibly the main exceptions are the EU States that do share a common launcher, not all participating to its development, but all having a guaranteed access to it through the ESA convention they agreed on[38][18].

Towards Commercial Launches

Interesting to note the evolution of the launcher sector, going towards a increased role given to commercial (private) interests[10][18][19].

For former space fairing nations like US, Russia and European countries, the space access slowly becomes more seen as an important economic asset rather than only national prestige, encouraging the launchers industry to look towards other sources of funding than public space agencies, on which they still strongly depend[15][10][12][22][23][27][32].

This may open the door to some types of cooperation in this sensitive area.

For example the private company that exploited Spacehab as a carrier for payloads and selling space commercially did not own the launcher itself (Shuttle). Therefore cooperating with a country on its institutional launcher could include carrier-like services to be offered commercially as services or design of specific adapters while not owning the launcher itself.

A parallel situation can be found in the aviation industry, that has roughly fifty years advance over space transportation: cooperation is made possible in technology developments or transport services, driven by economic interests rather that national prestige. Obviously the economical activity

involving a given plane is not limited to the state owning the development and manufacturing of the plane itself.

SECURING ACCESS TO SPACE FOR SPACE EMERGING NATIONS

Other Means of Securing Access to Space, without a Launcher

What are the other means to secure access to space without owning a launcher?

One shall recognise that most States are free to buy a launch for their satellite, but this is a market-oriented approach and certainly cannot be considered as a State's guaranteed access to space, in a sovereign level.

Under certain limits, it is even possible today to buy a complete launcher from an old proven generation like the Russian launchers. This is considered as a valid option at private commercial level as well as state level, like some European States.

The only viable and large-scale option seems therefore to consider bilateral or multilateral agreements guarantying access to space under practical conditions and with a long term commitment and for peaceful purposes.

Why an IGA?

An Intergovernmental Agreement guarantying access to launches on a non-discriminatory basis and on reasonable costs terms, could help securing States' access to space, while also providing a source of income for the launcher industry.

It could be enough to avoid, at least in a first phase, the costly and risky development of a launcher for that space emerging nation.

This IGA should be seen in the point of view of the cooperation, for exclusively peaceful purposes, fostering participation on space related developments with a faster visible return, like disaster management or telecommunications, and possibly extending later onto the participation to larger projects involving international cooperation and why not involving next-generation launchers.

The suggested access at "non-discriminatory basis and on reasonable costs terms", for exclusively peaceful purposes, is given here as a reference to the United Nation Resolution on Remote Sensing[13] that somehow can be seen as having similar point of view in the sense that giving access to space (data) on a cooperative basis rather than protecting technological advance can be fruitful for both parties[16][30].

Prestige versus Development of a Launcher?

However for at least some countries, the question will remain as if a State that does not possess a launcher can consider itself as having a guaranteed access to space, by means of this IGA, and whether this will be enough in the prestige or sovereignty point of view?

In a first answer, it seems that such IGA is not considered enough by big countries like China and India, because of the military dual-use of the launcher technology, and maybe also because the prestige of access to space is still important for them in affirming their growing role in the world. However for some others, certainly such agreement would be an important incentive to start a long-term participation in national and international space developments.

EXISTING LAUNCHER AGREEMENTS[1]

ESA Ariane series

The Ariane series launchers developed under a programme of the European Space Agency (ESA) are ruled by some agreements between European countries sharing the development and qualification of the launcher, and by the ESA convention itself[38][36], giving de facto a guaranteed access to space to all EU states and even those not directly involved in developing the launcher[12][25][28][26][35].

TSA (Technology Safeguard Agreements)

Some TSA agreements were signed up to now to secure the access to a launcher while safeguarding interests of the state contracting a launch[6][7][8][2][3][4].

These agreements concerned mainly US securing alternatives for launches, and not countries without a launcher, however they are a good basis on how to safeguard the interests of both parties[33].

An exception seems to be the TSA agreement (not ratified) proposed with Brazil[6], not to exploit their launcher under development but to create a launch pad in Alcantara under US control. Eventually this proposed agreement was not seen as an equilibrated cooperation.

Mutual Launcher Backup

A few references are found about so-called Backup agreements between launchers owners, some considering commercial launches[23][21] and probably some considering institutional launches[9].

Although these agreements, signed or only under discussion, concern countries or organisations having a launcher, they are interesting in the sense that they show a possible cooperation between competitors, obviously under well defined commercial conditions.

Other signed Bilateral Agreements[1]

Some other agreements between states exist, like those securing the exploitation of old-generation Russian launchers that are still a valuable commercial asset[4]. However these agreements consist essentially in buying a launcher and seems to concern private companies in developed countries having most of them already an access to space[21][3], therefore not contributing in securing access to space to space emerging nations without a launcher.

MOTIVATIONS FOR SHARING ITS ACCESS TO SPACE WITH SPACE EMERGING NATIONS

Possible Interest of Launchers Owners

Would countries be ready to "share" their access to space, considering the potential income, or for other reasons?

It is very unlikely that the potential income originating from such IGA guarantying access to space at reasonable conditions is high enough to justify by itself the interest of a space fairing nation in signing such agreement. But the income being at least not zero, this should not avoid such agreement on being considered.

Other reasons are certainly to be found on the more global point of view of the benefits from peaceful international cooperation on high-technological space projects.

The on-going (slow) tendency on privatisation of the exploitation, if not the development, of

launchers[18] should also be a favourable element for reaching such agreement as being a way to establish a long-term confidence relation with potential future users of launch services[9][20].

Interesting to note that today even countries like US or European countries does use "low-cost" launchers from foreign countries like India, thus minimising the relative importance of or support to their sovereign launcher for pure economic considerations.

Limits of Cooperation on Launchers Technology

Apart from commercial considerations, the cooperation in space technology and launchers in particular remains a difficult area due to the dual use nature of the launchers and security oriented agreements controlling the exportations or limiting developments[5].

An agreement on guaranteed access to a launcher will certainly reinforce possible cooperation on space projects, however can the launcher development itself be the object of a cooperation?[10][11]

Such agreement possibly fits the context of international cooperation "on an equitable and mutually acceptable basis" as encouraged by the United Nations[13][34].

Up to recently, launcher's technology were considered as highly sensitive, and this does go in parallel with the consideration that a launcher is an object of national prestige and sovereignty, with military implications. However the tendency towards launches as private services may open the way for a possible cooperation in a few years, considering also that a launch involves many annex technology domains less "sensitive" including ground stations, telemetry...

The same happens with the aeronautics developments: while a plane has certainly a military dual-use nature, it is involved in many forms of cooperation, both at development and transport service levels.

CONCLUSIONS

This paper addressed two main questions related to the freedom of access to Outer Space: Could a *Space Emerging Nation* that does not possess a launcher consider itself as having a guaranteed access to space, by means of an Intergovernmental Agreement? And what could be the motivations of a *space fairing nation* in having such agreement?

This subject is wide and linked to many different areas, and this paper tried to introduce each of them. They certainly deserve a deeper analysis on a follow-up work, before an agreement could be considered.

Some recommendations can be highlighted from this paper:

- cooperation in the field of space transportation in view of guarantying access to Outer Space can be interesting for both parties even without involving, at least initially, substantial exchange of funds,

- cooperation in launchers technology will be soon possible, as the launchers move towards commercial exploitation, like airplanes, and some forms of cooperation are less sensitive like ground support and transport services,

- the United Nations are a good framework for such cooperation in an equitable way, for both space fairing and space emerging nations[34].

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