

BETWEEN CONCORD AND RIVALRY

Requirements for and Political Feasibility of Modifications of Planetary Operations Legal Regime

Jakub Ryzenko

Polish Space Office

&

Institute of International Relations,

Warsaw University, Poland

ryzenko@onet.pl

Anna Burzykowska

European Space Policy Institute

&

Institute of Air and Space Law,

Leiden University, Netherlands

aburzykowska@wp.pl

In recent years the world can observe the rebirth of serious political interest in space exploration. Consequent conduct of increasingly extensive planetary operations will raise legal challenges that should be addressed in the interest of efficiency of exploration. Authors argue that establishment of multilateral legal regime governing planetary operations is politically feasible and the time to undertake this effort has already come. The experience of development of the deep seabed regime is briefly analysed as it provides an important lesson to be learnt.

In the early period of development of space law, when the Outer Space Treaty (1967) and the Moon Treaty (1979) were negotiated, the realm of planetary operations was considered as an issue of sufficiently distant future to formulate only general regulations governing activities on the Moon, Mars and other celestial bodies. The detailed provisions were left for future generations to conclude, when human presence and active exploration of extraterrestrial lands would become feasible. In this paper authors argue that this time has already come.

Space law community should ensure that law governing space operations, in particular planetary operations, will not hinder exploration efforts but will be responsive to the prerequisites such as political stimulation (*what is negotiable*), economic justification (*what is viable*) and legal soundness (*what needs to be*

regulated, what can be freed from detailed provisions). As the history of the regulatory frameworks of other “common lands” (Antarctica, high seas and the deep seabed) shows, it can be expected that the development of technological capability will foster detailed legal solutions. Logically, we should be prepared to derive from those already successfully negotiated regimes.

Renewed interest in space exploration

The interest in continuous human space exploration beyond Earth orbit had been emerging several times since the time of first landings on the Moon. Different visions and programs were envisioned and sometimes declared, but none had been implemented. They lacked either wider political support or economic feasibility or proved technically unrealistic.

Nowadays we can observe yet another return to the theme of exploration. However, several circumstances suggest that current case may be different and declarations of today may actually lead to real planetary operations of tomorrow.

American Space Exploration Vision, however its origin is directly related to Columbia accident, first and foremost reflects a more fundamental change. It is deeply rooted in a growing belief that NASA may not achieve its strategic mission (and expectations the society puts in NASA) limiting itself to operations in low Earth orbit.

As a result, NASA is evolving towards becoming an exploration agency. And it has to be remembered that American space agency has always had a very stable share of federal budget – the resources that now are being redirected to exploration. Moreover, at least until now, this move seem to have had a strong and, very importantly, bipartisan support in Congress.

Furthermore, recently presented NASA Exploration Architecture, however often criticized for being too conservative technologically, is certainly feasible – both technically and economically.

Chinese human space programme and its intentions are much more difficult to evaluate. On the one hand, pace of capabilities development is rather moderate, on the other landing on the Moon has been declared as a long-term goal and can be regarded as technologically feasible. Taking into account geopolitical context, growing competition between US and China together with strategic importance of space and its visibility encourage assumption that it will not be an Apollo-like, single-shot program, but rather consecutive planetary operations will follow. It should be also noted that this will represent additional incentive for US space activities beyond LEO.

Today exploration ambitions of similar scale do not have sufficient political backing within other space powers like Europe or Japan. Nevertheless, it is reasonable to expect that as exploration programs of others mature, these countries (as well as some other emerging space players) may find the participation a political and strategic necessity.

Altogether, it seems to be a well-grounded assumption that within 15 years perspective planetary operations will commence and their scale will significantly expand within next 10 years. Close prospects of real planetary operations will pose a challenge for international space law.

Upcoming planetary operations

It is very difficult to foresee today a precise character of Moon operations that will be conducted. On the other hand, their general nature is rather clear.

Efficient utilisation of local resources is a pre-condition for cost-effective planetary operations. Actually, learning to “live off the land” is even declared by NASA as an overarching goal for its initial lunar surface operations.

A thick layer of regolith will almost certainly be used to provide sufficient protection against radiation for permanently occupied structures. During further development the regolith can be chemically processed and used as a source of energy and to build new construction elements. Some of already considered concepts suggest that regolith should also be chemically processed to build large open areas covered with solar panels – solar farms.

Currently discussed plans of in-situ resource utilisation (ISRU) do not limit to very abundant regolith. If water ice is found on the Moon, it will most probably be heavily exploited, regardless of its limited quantities.

Local resources will not be used only on the surface and for local needs. Current concept of NASA Crew Exploration Vehicle foresees that its engines will be able to use in-situ developed fuels. Furthermore, planetary resources can be used not only for actual base operations, but also for space flights, both Earth-Moon communication and interplanetary flights. In a longer perspective local resources could also be used to manufacture structures of future spacecraft.

Surface operations will require establishment of certain standards. Initial Moon activities will certainly be conducted in accordance with planetary protection requirements. However, during further operations this issue will be of growing importance as an actual level of protection will directly influence costs of long term activities.

Safety concerns may also arise in case of use of nuclear energy. In 15 years Project Prometheus of NASA should result in development of small nuclear reactor. As soon as it becomes available, it will represent an encouraging technical solution to provide planetary bases with efficient source of almost unlimited quantities of energy.

Promotion of participation of entrepreneurial companies in space exploration is regarded today as potential solution for long-term reduction of costs for governmental programs and a potential factor fuelling space exploitation.

Several activities, instead of being fully funded by governmental agencies, could be purchased in a form of services, with long term contract guarantees securing the investment. As an example, solar farm providing energy for Moon base could be developed and funded by entrepreneurial company. Then, such company could also be interested in further development of its activities, e.g. beaming energy to Earth. Yet, commercial companies will be willing

to invest only if legal environment will be safe, clear, and predictable.

Legal challenges

Summarising, within the perspective of 15–25 years three areas will probably represent the most significant legal challenges for space-exploring nations:

- ◆ defining legal framework for exploitation of planetary resources (including abundant and limited resources; public and commercial use thereof; for in-situ and distant operations)
- ◆ establishment of universally accepted standards and procedures safeguarding and protecting critical interests of all space-exploring nations and/or humanity
- ◆ securing legal environment for real business operations on celestial bodies

Political feasibility of multilateral regulations

All of those issues will have to be addressed at the dawn of space exploration. It is not clear today whether states will choose unilateral actions and development of bilateral agreements based on reciprocity, or will cooperative, multilateral approach prevail. Though, authors argue that development of multilateral regime is politically feasible.

For the sake of efficiency, which is in the interest of all space-exploring nations, codes of conduct governing hazardous activities should be universal and their development and modifications – commonly agreed. The same applies to legal regime governing planetary business operations – wider it is accepted, the higher will be the legal safety of private space investments.

Interestingly, similar argument can be constructed in case of resource exploitation. Nowadays, the unilateral approach may seem attractive for certain governments, particularly as a mean of avoiding “unnecessary limitations” with regard to

freedom of their actions and potential benefits. But wisely and realistically developed international space law should not be considered as inevitably harmful for those benefits nor excessively restraining. Furthermore, space exploration is absolutely not a field, political dimension of which can be analysed in a short time perspective or limited scope. And when geopolitics comes to play, one has to take into account evolutionary shift of the global balance of power, potentially even leading again towards more polarized world. In such a world the international space law may become acknowledged again, together with the added value of efforts of international community, simply by the virtue of the authority that stands behind them.

The discussed regulatory challenge is triggered by the growing political will for and forthcoming technological feasibility of planetary exploration. Today both phenomena seem to have a potential to remain long-lasting factors. In these circumstances it is a role of space law community to voice a need for new regulations, to convey a message promoting benefits of multilateral regime and to prove its long-term political feasibility. To convince that under international regime states can realize their interests with minimal burden and at the same time gain its benefits.

It is also the role of this community to offer a wide scope of options, different paths that states could choose from.

The science and the fiction behind the Moon Treaty

The famous Moon Treaty of 1979 was the first and so far the last attempt to provide a codification of the existing customary and international laws found specifically applicable to the planetary operations. Nevertheless, its provisions occurred to be unsatisfactory and incomplete for the overwhelming majority of states sealing its fate as a document

irrelevant to the larger scheme of space exploration, especially with the view of commercial use and exploration of extraterrestrial resources.¹

While listing the major obstacles for ratification of the Moon Treaty the particular attention is usually brought to provisions of Art. 11 which identifies "Moon and other celestial bodies" as the common heritage of mankind (CHM) and stipulates the establishment of the legal regime governing the exploitation of natural resources thereof. The most troublesome is the idea of the distribution of profits derived from such activity, regarded as deterring any private (or commercial) undertaking. Simply the Moon Treaty regime at the time of its conclusion favoured the interests of developing states without securing essential incentives for *de facto* space-faring nations. The vague definition of the CHM principle applicable to the space resources and the critical restriction of the exploitation rights thereof pending the specific international agreement (Art. 11 (3)&(5)) caused many justified fears and abstentions from ratification of this treaty or the recognition of its binding force. The Moon Treaty as a standalone document only postulating development of a further detailed regime proved to be not satisfactory to legally secure the activities in place.

The parallel scenarios for the organization of planetary exploration

Similarities to the CLOS

For several decades a similar problem was a subject of the discussions on other international legal forum. For the purpose of this paper the history of the negotiations of the regime pertaining to the deep seabed is serving as an example of the successful political and legal considerations, paving the way to the conclusion of the

¹ A. Browne, The Law of the sea Convention and U.S. Policy, Foreign Affairs, Defence and Trade Division, February 14, 2001

universally accepted rules and procedures governing activities in the "common lands".

The deep seabed and the subsoil of the high seas had remained free from regulation by widely recognized multilateral treaties as in the view of some countries they were bearing the same difficult characteristics of the common heritage of mankind as the Moon and other celestial bodies in the Moon Treaty. Therefore, 1982 Law of the Seas Convention (CLOS) became a milestone of the regulatory effort by the states to set a legal framework governing the exploration and exploitation of minerals at the deep seabed, enshrined as CHM in Art. 136. Part XI (The Area) and Annexes: III (Basic Conditions of Prospecting, Exploration and Exploitation) and IV (Statute of the Enterprise) set the basis for the legal regime and the structure of the international organization regulating future use and exploitation of the international areas beyond the national jurisdiction by public and private entities. This regime was defined as follows.

The first model for exploitation proposed by CLOS in 1980's was based on the centrally controlled economic plan that had a precedence before free market principles, giving to the states of major interests and capability in seabed mining no voice in a decision making process commensurate to their interests. International Seabed Authority (ISA) was conceived to organize, control and administer the activities on the deep ocean floor. Nevertheless, the Council (ISA decision making body) was dominated by the developing countries (as per Art. 161). Other controversial requirement provided that seabed mining applicants would have to turn over one-half of their mine site to The Enterprise - ISA's operating arm created to develop those resources on behalf of the organization (and the mankind *per se*). In the first version of the CLOS the transfer of the mining technology by developed states to The Enterprise or even possibly to the

developing countries was conceived as another form of the realization of the CHM principle. In addition the regime established the production controls over certain minerals available "on Earth" and special favourable economic advantages to The Enterprise (Art. 150&151 - Production Policies). Finally, the system of annual payments to finance ISA and to share revenues was consequently reducing commercial feasibility of the seabed mining. The possibility to amend provisions of Part XI of the CLOS without the consent of most interested states could result in evolution of the regime towards even more radical forms.

After the CLOS was open for ratification, most of the industrialized countries objected its provisions, referring specifically to the seabed mining and declared their non adherence pending significant changes to the sections dealing with the resources beyond national jurisdiction. At the beginning of 1990 the additional negotiations started and resulted the adoption of the 1994 Agreement Relating to the Implementation of Part XI of the UN Convention of the Law of the Sea (and its Annex known as the "Seabed Protocol"). The Agreement was a decisive factor to take industrialized countries aboard and to ensure universal participation in the Convention on the Law of The Sea.

The Seabed Model

The provisions of the Protocol were to be interpreted and applied together with the Convention as a form of *lex specialis* to the Part XI of CLOS. Countries with major economic interest got the adequate influence over future decisions on possible seabed mining. For the state having the largest economy in terms of GDP on the date of the entry of the convention into force (i.e. USA) the seat on the Council has been permanently guaranteed (SEC 3.15). The Protocol provided also that administration of the seabed regime will be based on the free market principles which

eliminated obligatory technology transfers (SEC 5) or onerous fees for entering the mining Area (SEC 1.6). It abolished the production control placed in order to protect land-based producers as well as incentives for already existing initiatives such as The Enterprise (SEC 6). By doing that no state or entity could arrange its exploitation on the conditions less favourable than the best granted to previous claimants.² Compulsory dispute settlement's provisions had been sustained. Finally the Protocol assured the ability to veto the most important financial decisions by industrialized countries in the Finance Committee (a Council's organ dominated by the biggest economies) as well as the decisions related to adoption of amendments to seabed regime and to the distribution of royalties directly in the Council (SEC 3). With respect to the latter states agreed on the economic assistance to the states economically suffering from the adverse effect of the seabed mining, setting special fund from which on the case-by case basis necessary support would be granted (SEC 7).

The UNGA Resolution 48/263 opening the Seabed Protocol to signature was adopted on 28 July 1994 with 121 for, no against and 7 abstentions. All industrialized countries, including US and EU signed the Agreement on July 29th. Nevertheless, the process of ratification did not fully succeed. After the objection of the US Senate that prevented the ratification of the entire CLOS Convention, USA still holds an observer status in the International Seabed Authority, without executing its guaranteed seat in the Council – a decision making body. Legally speaking that means that US government

² With exception of the registered "pioneer investors" - countries and mining consortia that had made large investments in the survey and location of polymetallic nodules prior to the entry into force of the 1982 Convention. By the virtue of the Resolution II which was adopted with 1982 Convention they acquired exclusive rights to carry out pioneering activities in the areas already allocated to them.

still regards deep seabed mining as a freedom of high seas under customary international law.³ As a consequence US contends that its nationals enjoy the right of access to seabed minerals and this can be only altered by the US's acceptance of a different legal regime through the process of conventional or customary international law. Until that, US citizen can engage in activities concerning the mining of a seabed only in accordance with the license issued by the Federal Government pursuant to customary law.

It can be argued that lack of any directly applicable or widely recognized agreement concerning exploitation of natural resources on the Celestial Bodies will make perspective analogous to the US standpoint described above the most probable scenario for the countries not adhering to the Moon Treaty. The legal boundaries drew by four other space treaties (the Outer Space Treaty of 1967 in particular) will be the ultimate constrain for them while defining the rights to access spatial mineral resources for themselves and their nationals. Needless to say, most states having essential interest in space exploration are ultimately favouring the principle of the freedom of use of outer space and enjoy their *de facto* exclusive right to determine how they share the benefits and results of their space activities.⁴ Moreover there is a general accordance to assume that the status of space environment deals minimally with the rule of non-appropriation which neither

³ K. Mwenda, Deep Sea-Bed Mining Under Customary International Law, Murdoch University Electronic Journal of Law, Vol. 7, No 2 (June 2000) at 16, see also The Deep Seabed Hard Mineral Resources Act of 1980

⁴ Treaty On Outer Space, Report Of The Senate Committee On Foreign Relations, Ex. Rept. No. 8, 90th Congress, 1 St Session, P.4 April 18, 1967: "*It is the understanding of the Committee (...) that nothing in Article I, paragraph 1 of the treaty diminish or alters the right of the United States to determine how it shares the benefits and results of its space activities*"

specifically forbids nor regulates any engagement in the exploration and use (including exploitation) of space resources. Analogically to the view that the ocean areas were allowed for community needs and enjoyments, but were not open to exclusive sovereign claims or limitations, the spatial areas are immensely vulnerable to the free execution of those rights as well. In the end the only unarguable obligations that states have are:

- ◆ to avoid sovereign claims to the extraterrestrial territories,
- ◆ to conduct the activities in outer space, at least without detriment to the interests of the other countries and
- ◆ the basic principles of planetary and environmental protection.

In this context we need to remember that the entire body of the space treaties is very general in character. In the case of the Moon Treaty the critique focuses on its incompleteness. The treaty provides difficult terminology (like CHM), without adequately addressing ideas standing behind it. As it was proven by the seabed regime and also CLOS Convention, the detailed and exhaustive regulation, which introduces clarity and comprehensiveness, may be easier to accept than another general, wide-ranging document.

Bringing earth to space

There is a lesson to be learned from the regime governing the exploitation of mineral resources of the deep seabed. First two observations lead to the conclusion that the activities on the so called “common lands” can not be and are not politically destined to be left without any specific regulation. Political stimulation, economic justification and legal soundness are the necessary prerequisites to adequately encourage, control and secure planetary operations. If outer space and celestial bodies are to be considered as areas of parallel legal regime, the particular protection of law should include:

1. Detailed provisions explaining CHM principle destined to be compliant with private economic activity and market principles;
2. Evolutionary approach which would take into account: functional needs of envisaged organs and international bodies regulating and administering the spatial areas in question; cost-efficiency; and minimal size of the administration;
3. Principle of the reasonableness in the “benefits sharing” and economic assistance to non-space faring nations;
4. Adequate influence by the industrialized countries in the decision-making process.