The Sustainable Development of Mineral Resources in the International Seabed Area: the Role of the Authority in Balancing Economic Development and Environmental Protection

James Harrison

Working Paper No. 3
The Sustainable Development of Mineral Resources in the International Seabed Area: the Role of the Authority in Balancing Economic Development and Environmental Protection

James Harrison*

Abstract: This paper considers recent developments in the international regime for the exploration and exploitation of seabed minerals beyond national jurisdiction. In particular, it analyses the role of the International Seabed Authority in regulating access to seabed mineral resources and the mechanisms through which the Authority balances the objectives of economic development and environmental protection.

‘The known resources of the sea-bed and of the ocean floor are far greater than the resources known to exist on dry land.’¹

‘A new phase in the life of the Authority is steadily approaching. This new phase involves the reality of deep seabed mining and the prescribed role of the Authority in organizing and monitoring such activities where they pertain to the Area.’²


The presence of minerals on the deep seabed was first discovered by the HMS Challenger expedition in 1873. Trawls of the seabed pulled up potato-sized nuggets, which were found to contain a range of substances, including nickel, copper, cobalt and manganese. These so-called polymetallic nodules were distributed across the abyssal plain, either sitting on the surface or half-buried. Yet, it was not for almost hundred years that it became possible to exploit these riches. Even today, the technological challenges of mining the deep seabed floor should not be underestimated. One industry source has described deep seabed mining as, ‘like standing on top of the Empire State Building trying to pick up small stones on the

* Lecturer in International Law, University of Edinburgh School of Law. Contact email: james.harrison@ed.ac.uk.

¹ Arvid Pardo, Speech to the First Committee of the United Nations General Assembly, 1 November 1967, para. 91.

pavement using a long straw at night. Yet, the profits to be gained have pushed forward technology to the point where it is now technologically feasible to conduct seabed mining on a commercial basis.

We also now know that it is not only nodules that are awaiting us on the ocean floor. As our knowledge of the deep seas has increased, we have also discovered additional sources of marine minerals hidden beneath the oceans. Alongside the deposits of polymetallic nodules, we are now aware of mineral accumulations on seamounts and underwater mountain ranges thousands of metres below the surface. Not only do they offer an additional source of cobalt and copper, but they have also been identified as a possible source of rare earth elements, a set of metals which are increasingly used in modern technological applications and for which there is high demand and limited land-based supplies. In addition, scientists have discovered marine deposits of polymetallic sulphides, formed by chemical reactions between seawater and rocks at underwater hot springs know as smokers. Polymetallic sulphides constitute a valuable source of copper, zinc, lead and gold.

To date, none of these resources are being commercially exploited. However, industry analysts have suggested that this is about to change. Firstly, it is has been noted that, ‘some base metals (like copper) are becoming depleted on land-based deposits and present-day market prices make the search for marine minerals more attractive.’ Secondly, technology continues to develop, making the extraction of seabed minerals less expensive. It is therefore predicted that deep seabed mining could become a commercial reality within the next decade. This is also partly reflected by the increasing interest from the private sector in

---


6 There have been a number of trade disputes concerning land-based sources of these minerals, demonstrating concerns about security of supply. See China - Measures Related to the Exportation of Rare Earths, Tungsten, and Molybdenum, Reports of the Appellate Body, Documents WT/DS431/DS432/DS433, AB/R, 7 August 2014; China - Measures Related to the Exportation of Various raw Materials, Reports of the Appellate Body, Documents WT/DS394/DS395/DS398/AB/R, 30 January 2012.

7 International Seabed Authority (n4) 49.

8 Madureira (n5) 114.

9 Nautilus Minerals has recently announced the completion of its first seafloor production tool designed to collect polymetallic sulphides; see ISBA Press Release, ‘ISA Secretary-General gets first look at Nautilus Minerals Polymetallic Sulphides Mining Technology’, 17 September 2014.

10 Report of the Secretary-General of the International Seabed (n2) para. 92.
applying for exploration licences.\textsuperscript{11}

Moreover, it has been argued that there are certain advantages to developing seabed mining. In particular, it has been noted that, in contrast to land-based deposits which are often buried deep within the earth and therefore ‘require the removal of large amounts of barren overburden rock, leaving a significant footprint in the landscape, […] most marine mineral deposits sit at the seabed with little or no overburden to remove.’\textsuperscript{12} That is not to say that the exploitation of these resources has no impact on the seabed environment. In fact, extraction of seabed minerals can be equally, if not more, controversial than land-based mining and there is a need to balance the economic gains to be made from seabed mining with the impact it will have on seabed ecosystems.

The international regime that has been developed to oversee the exploration and exploitation of the seabed beyond national jurisdiction is vital to achieving this balance. This chapter will consider the legal status of resources on the deep seabed and the regulatory regime that applies to them. It will explain the mandate and powers of the institutions set up to oversee deep seabed mining as well as the rules and regulations that apply to this type of activity. Finally, it will identify the challenges that remain for the international community in implementing the deep seabed mining regime in a manner that is consistent with and promotes the objective of sustainable development.

2. The Institutional Framework for Seabed Mining

2.1 Designation of Resources in the Area as the Common Heritage of Mankind

With the advancement of technology in the mid-twentieth century that made the exploitation of seabed resources practically feasible, many states began to view the seabed as ‘a place of concentrated wealth, which had not been subject to national appropriation and could, therefore, be used to correct the profound inequalities amongst states, particularly the newly-independent states created as a result of the decolonization process.’\textsuperscript{13} This interest led to seabed minerals assuming a prominent place on the international agenda. In particular, fair and equitable access to the potential wealth to be gained from seabed mining was promoted

\textsuperscript{11} See below.

\textsuperscript{12} Madureira (n5) 115.

by developing states as part of their agenda for a new international economic order. It was argued that these minerals should not be permitted to be subject to exploitation by the world’s richest countries, but that the benefits of seabed mining should accrue to all states.

The issue of regulation of deep seabed mining was first raised by Ambassador Pardo of Malta in his now famous speech to the First Committee of the United Nations General Assembly on Wednesday 1 November 1967. Ambassador Pardo talked about the rich resources that were located on the seabed and the need to prevent ‘a competitive scramble for sovereign rights over the land underlying the world’s seas and oceans.’ To this end, the Maltese delegation proposed the establishment of ‘a special agency with adequate powers to administer in the interests of mankind the oceans and the ocean seafloor beyond national jurisdiction.’

In response to the speech, the United Nations General Assembly agreed to establish a Committee on the Peaceful uses of the Seabed whose initial mandate was to prepare a survey of state practice on the deep seabed and the ocean floor, an account of the scientific, technical, economic, legal and other aspects of the issue, and an indication of practical means of promoting international cooperation in the exploration, conservation and exploitation of the ocean floor. The work of the Committee led to the adoption of the 1970 Declaration of Deep Seabed Principles in which states agreed that the seabed beyond national jurisdiction was to be designated as ‘the common heritage of mankind.’ According to this Declaration, ‘no State shall claim or exercise sovereignty or sovereign rights over any part [of the seabed and ocean floor beyond national jurisdiction].’ They also agreed to continue negotiating a regime for the exploration and exploitation of seabed minerals in the interests of the international community as a whole.

---

15. Pardo (n1) para. 91.
17. Examination of the question of the reservation exclusively for peaceful purposes of the sea-bed and the ocean floor, and the subsoil thereof, underlying the high seas beyond the limits of present national jurisdiction, and the use of their resources in the interests of mankind, UNGA Resolution 2340(XXII), 18 December 1967, para. 2.
19. Ibid, para. 2.
This issue was subsequently taken up by the Third United Nations Conference on the Law of the Sea\(^{21}\), where deep seabed mining was one of the major issues on the agenda.\(^{22}\) The resulting 1982 United Nations Convention on the Law of the Sea confirms the designation of the deep seabed and its resources as the common heritage of mankind.\(^{23}\) In furtherance thereof, Part XI of the 1982 Convention defines the seabed and ocean floor beyond national jurisdiction as the International Seabed Area or simply the Area.\(^{24}\) The Convention also creates a mechanism to delineate this zone from the continental shelf under national jurisdiction, involving an independent Commission on the Outer Limits of the Continental Shelf.\(^{25}\) At present, this process of delineation continues and there is therefore some ‘uncertainty regarding the effective size of the Area.’\(^{26}\) Indeed, the workload of the Commission means that this process is likely to take several decades to complete. From the perspective of exploring and exploiting marine minerals at the interface of these two legal regimes, ‘the uncertainties relating to the delimitation of maritime spaces can lead to a paralysis’\(^{27}\), which will only be solved once the Commission has completed its work. Nevertheless, there are many spaces which clearly fall within the Area, particularly the Clarion-Clipperton Fracture Zone in the eastern central Pacific Ocean. These regions can be confidently explored and exploited subject to the international regime for seabed mining established by the 1982 Convention.

Part XI of the 1982 Convention applies to the ‘resources’ of the Area, which are defined in the Convention as ‘all solid, liquid or gaseous mineral resources in situ in the Area at or beneath the seabed, including polymetallic nodules.’\(^{28}\) Thus, despite the fact that polymetallic nodules are the only source of mineral explicitly mentioned and ‘the nodules

---

21 *Reservation exclusively for peaceful purposes of the sea-bed and the ocean floor, and the subsoil thereof, underlying the high seas beyond the limits of present national jurisdiction and use of their resources in the interests of mankind, and convening of a Conference on the Law of the Sea*, UNGA Resolution 2750 C (XXV) 17 December 1970.


24 UNCLOS, Article 1(1).

25 UNCLOS, Article 76 and Annex II.

26 Bastos (n13) 131. See also E Franckx, ‘The International Seabed Authority and the Common Heritage of Mankind: The Need for States to Establish the Outer Limits of their Continental Shelf’ (2010) 25 *LIMCL* 543-567.

27 Bastos (n13) 132.

28 UNCLOS, Article 133(a).
played a significant role in driving the development of the Convention\(^{29}\), the regime is broad enough to cover all types of non-living resources found on the deep seabed.\(^{30}\) At present, this includes polymetallic sulphides and cobalt-rich crusts, although it is possible that other deep seabed mineral resources could also be subject to the common heritage regime in the future, including frozen gas hydrates.\(^{31}\)

2.2 A Universal Regime for Seabed Mining

Deep seabed mining had been one of the most contentious issues at the Third United Nations Conference on the Law of the Sea and it was objections to the provision in Part XI of the Convention which ultimately led to the rejection of the treaty by the United States and other industrialized countries.\(^{32}\) Yet, it must be understood that the objections were not directed towards the principle of common heritage of mankind, as such. In fact, no states had opposed the adoption of the 1970 Declaration\(^{33}\) and national legislation implementing an interim regime for seabed mining in states that had not accepted the Convention nevertheless implicitly accepted that seabed resources were the common heritage of mankind and that they could not be exploited in the interests of any single state.\(^{34}\) Rather, the disagreements related to the manner in which this principle should be operationalized.\(^{35}\)

\(^{29}\) International Seabed Authority (n4) 58.

\(^{30}\) It should be noted that Part XI does not apply to non-living resources of the Area. As a result, there is disagreement about whether genetic resources of the deep seabed are the common heritage of mankind. This issue has been debated in the UN Ad Hoc Informal Open-Ended Working Group on the Conservation of Biological Diversity beyond in Areas beyond National Jurisdiction, without any resolution to date. See L de la Fayette, ‘A New Regime for the Conservation and Sustainable Use of Marine Biodiversity and Genetic Resources beyond the Limits of National Jurisdiction’ (2009) 24 IJMCL 221-280; A Broggiato et al, ‘Fair and Equitable Sharing of Benefits from the Utilization of Marine Genetic Resources in Areas beyond National Jurisdiction: Bridging the Gap between Science and Policy’ (2014) 49 Marine Policy 176-185.

\(^{31}\) Madureira (n5) 114.


\(^{33}\) Declaration of Principles Governing the Sea-Bed and the Ocean Floor, and the Subsoil Thereof, beyond the Limits of National Jurisdiction (n18). The Declaration was adopted by 108 votes in favour, 0 votes against, with 14 abstentions. The vote was unrecorded.


\(^{35}\) President Reagan explained that the United States decision not to sign the Convention rested upon ‘several major problems in the Convention's deep seabed mining provisions [which] are contrary to the interests and principles of industrialized nations and would not help attain the aspirations of developing countries’; see http://www.reagan.utexas.edu/archives/speeches/1983/31083c.htm. See also the answers by the UK Foreign Secretary (Malcolm Rifkind) on 2 December 1982, HC Deb 02 December 1982 vol 33 cc404-10: ‘the provisions relating to deep seabed mining including the transfer of technology are not acceptable. They are based on undesirable regulatory principles and could constitute unsatisfactory precedents. A number of our friends and allies share our misgivings on those points. We need to obtain satisfactory improvements in the deep sea mining regime and will therefore explore the prospects with interested States. As the convention is open for signature for two years, there is ample time for revision before taking a final decision. It is our wish that there should be generally agreed provisions for regulating marine matters and we wish to continue to work with the international community to achieve that. I should emphasise to the House that we could not participate in a
After several years of stalemate, it became clear that further negotiations would be necessary if progress was to be achieved. In 1989, the United Nations General Assembly called on all states to make renewed efforts to facilitate universal participation in the Convention. In furtherance of this mandate, the United Nations Secretary-General initiated a series of informal negotiations between interested parties in order to achieve the goal of universal participation. Between 1990 and 1994, fifteen meetings took place, which eventually led to a new settlement, set out in the 1994 Part XI Implementing Agreement. This agreement was adopted by the General Assembly on 28 July 1994 by 121 votes for, with zero votes against, and only seven abstentions. This instrument successfully bridged the divide between the developed and developing countries on the issue of the deep seabed. Although it is not explicitly a protocol of amendment, the provisions in Part XI of the Convention must now be read in light of the 1994 Agreement. The new arrangements have meant that the Authority can take up its role as ‘the organization through which States Parties (...) organize and control activities in the Area.’ Indeed, the regime set out Part XI has arguably achieved the status of an objective regime that is binding on all states regardless of whether they are a party to the 1982 Convention or the 1994 Agreement. Even the United States, which remains one of the most prominent non-parties to the Convention on the Law of the Sea, signed the 1994 Agreement and participated in the Authority in the early years by virtue of its status as a ‘provisional member’, demonstrating its acceptance of the principles underpinning the Part XI regime and the mandate of the Authority. Indeed, the United

36 Law of the Sea, UNGA Resolution 44/26, 20 November 1989, para. 3. The preamble refers to the expressions of willingness to explore all possibilities of addressing issues in order to secure universal participation in the Convention, made at the meeting of the Preparatory Commission in August/September 1989.
40 Part XI Agreement, Article 2(1).
41 Part XI Agreement, Annex, Section 1, para. 1.
43 Part XI Agreement, Article 7.
44 It has been argued elsewhere that “[the US] support for the conclusion and implementation of the Part XI Agreement could be interpreted as acceptance that Part XI provides the only applicable legal framework for
States continues to actively participate in the Authority to date as an observer.\textsuperscript{45} Thus, through achieving consensus on the new arrangements, states have created a truly universal multilateral regime for the regulation of seabed mining.

2.3 The International Seabed Authority

Part XI of the 1982 Convention establishes the International Seabed Authority as the international organization to oversee the conduct of activities in the Area.\textsuperscript{46} The Authority is established as an autonomous institution, with international legal personality\textsuperscript{47} and its own secretariat.\textsuperscript{48} All States Parties to the 1982 Convention are automatically members of the International Seabed Authority. The Authority has a range of substantive powers to adopt rules to regulate deep seabed mining, as well as the ability to enforce these regulations. Yet, the original institutional structure of the Authority has been significantly altered by the conclusion of the Part XI Agreement. On the one hand, the new arrangements address the political balance within the organization between different interest groups, notably industrialized countries and developing countries; the composition, powers and decision-making procedures of the organs of the Authority have been modified in order to ensure that all major interest groups have a say in how the seabed mining regime evolves over time. On the other hand, the Part XI Agreement introduces changes to the institutional structure of the Authority, with a view to promote the ‘cost-effectiveness’ of the organization.\textsuperscript{49}

\textit{a) The Assembly}

The Assembly is the plenary organ of the Authority\textsuperscript{50}, consisting of all Member States.\textsuperscript{51} It has a broad mandate and is competent to establish general policies on any question or matter within the competence of the Authority.\textsuperscript{52} However, its powers have been somewhat

\begin{footnotesize}
\textsuperscript{46} According to UNCLOS, Article 157: ‘The Authority is the organization through which States Parties shall, in accordance with this Part, organize and control activities in the Area, particularly with a view to administering the resources of the Area.’
\textsuperscript{47} UNCLOS, Article 176.
\textsuperscript{48} UNCLOS, Article 158, 166-168.
\textsuperscript{49} Part XI Agreement, Annex, Section 1, para. 2.
\textsuperscript{50} It is described in Article 160 of the Law of the Sea Convention as the ‘supreme organ of the Authority.’
\textsuperscript{51} Law of the Sea Convention, Article 159(1).
\textsuperscript{52} Law of the Sea Convention, Article 160(1). Article 160(2) goes on to elaborate a detailed list of powers and functions of the Assembly.
\end{footnotesize}
diminished by the Part XI Agreement, which states that the Assembly must act in collaboration with the Council on all issues.\(^\text{53}\) In practice, this means that the Assembly has become a rubber stamp for decisions of the Council on most matters.\(^\text{54}\) It is perhaps for this reason that the Assembly has struggled to attract the interest of states and that participation has been problematic.\(^\text{55}\)

**b) The Council**

The Council is designated as the ‘executive’ organ of the Authority\(^\text{56}\), although it is arguably the most important body within the institution and its mandate extends to a range of functions, not all of which are executive in character. The Council consists of thirty-six representatives of the Member States, elected every four years by the Assembly.\(^\text{57}\) Which states that were to have a seat on the Council and how it would make decisions were the subjects of intense discussion during the consultations leading to the conclusion of the Part XI Agreement.\(^\text{58}\) As a result of these negotiations, the composition of the Council is finely balanced to guarantee that all the major interest groups are represented. This is achieved through the creation of four so-called “chambers”, which are composed as follows:\(^\text{59}\)

- (a) Four members from among those States Parties which, during the last five years for which statistics are available, have either consumed more than two per cent in value terms of total world consumption or have had net imports of more than two per cent in value terms of total world imports of the commodities produced from the categories of minerals to be derived from the Area, provided that the four members shall include one State from the Eastern European region having the largest economy in that region in terms of gross domestic product and the State, on the date of entry into force of the Convention, having the largest economy in terms of gross domestic product, if such States wish to be represented in this group.\(^\text{60}\)

---

\(^{53}\) Part XI Agreement, Annex, Section 3, para. 1.

\(^{54}\) See discussion on the adoption of rules and regulations, below.

\(^{55}\) This is an issue regularly taken by the UN General Assembly. See e.g. Oceans and Law of the Sea, UNGA Resolution 68/70, 9 December 2013, para. 56.

\(^{56}\) UNCLOS, Article 162(1). For a full list of the powers and functions of the Council see Article 162(2). To describe it solely as an executive organ is misleading as it also plays an important part in policy-making.

\(^{57}\) Elections are staggered so that there are in fact elections for half the members every two years; UNCLOS, Article 161(3). For details of the first election of the Council, see M. Wood, ‘International Seabed Authority: The First Four Years’ (1999) *Max Planck U. N. Ybk* 172, 201-209.

\(^{58}\) The Part XI Agreement ‘disapplies’ the original provisions of the Convention, replacing them with an amended text; Part XI Agreement, Annex, section 3, paras 15 and 16.

\(^{59}\) Part XI Agreement, Annex, section 3, paras 15(a)-(d), replacing UNCLOS, Article 161(1).

\(^{60}\) The drafting of this provision essentially guarantees a seat for the United States on the Council, were it to become a party to the Convention.
(b) Four members from among the eight States Parties which have made the largest investments in preparation for and in the conduct of activities in the Area, either directly or through their nationals;
(c) Four members from among States Parties which, on the basis of production in areas under their jurisdiction, are major net exporters of the categories of minerals to be derived from the Area, including at least two developing States whose exports of such minerals have a substantial bearing upon their economies;
(d) Six members from among developing States Parties, representing special interests. The special interests to be represented shall include those of States with large populations, States which are land-locked or geographically disadvantaged, island States, States which are major importers of the categories of minerals to be derived from the Area, States which are potential producers of such minerals and least developed States.

In addition to the chambers, a further eighteen members are elected according to the principle of equitable geographical distribution of seats so that each geographical region of the United Nations shall have at least one seat. In practice, the composition of the Council is also subject to a detailed political compromise. On this basis, the agreed allocation of seats in the Council is ten seats to the African Group, nine seats to the Asian Group, eight seats to the Western European Group, seven seats to the Latin American and Caribbean Group, and three seats to the Eastern European Group. As this adds up to thirty-seven and the official total of seats on the Council is thirty-six, it is agreed that each regional group other than the Eastern European Group will relinquish a seat in rotation.

**c) The Legal and Technical Commission**

The Legal and Technical Commission is a group of independent experts, specializing in subjects relevant to the exploration, exploitation and processing of mineral resources, oceanography, protection of the marine environment, or economic or legal matters relating to ocean mining and related fields of expertise. Members of the Commission are elected by the

---

61 Africa, Asia, Eastern Europe, Latin America and the Caribbean and Western Europe and Others.
62 Part XI Agreement, Annex, Section 3, para. 15(e).
63 See Wood (n57) 208.
64 Ibid.
65 UNCLOS, Article 165(1).
Council. They hold office for five years, although they are eligible for re-election. Formally speaking, the Commission fulfills a largely advisory role, ensuring that decisions of the Authority are based upon sound scientific and technical advice and information. In practice, however, it is probably one of the most influential organs of the Authority as it has the first say on most proposals that are subsequently considered by the political organs. Indeed, as will be seen below, the Commission has de facto decision-making authority on certain issues, subject to formal approval by the Council.

The Convention originally foresaw the establishment of a second technical commission to be called the Economic Planning Commission. However, in an effort to improve the ‘cost-effectiveness’ of the Authority and to streamline institutional structures, the Part XI Agreement mandates the Legal and Technical Commission to carry out the functions of the Economic Planning Commission, until such time as the Council decides otherwise or until the approval of the first plan of work for exploitation. In any case, the requirements of the Authority to adopt a production policy limiting the production of contractors has been reduced by the Part XI Agreement which instead dictates that ‘development of the Area shall take place in accordance with sound commercial principles.’ Thus, the need for an Economic Planning Commission has been reduced.

d) The Finance Committee

The Finance Committee is established as an additional organ under section 9 of the Part XI Agreement. It is composed of fifteen members with appropriate qualifications relevant to financial matters, serving in an individual capacity. Members are elected by the Assembly. However, the composition of the Committee is designed so that the major contributors to the budget of the Authority are guaranteed a seat and therefore have a greater say over the

66 See UNCLOS, Article 163. The Commission is composed of at least fifteen members. In practice, however, the number has been greater as the Council has exercised its powers under Article 163 of the Convention to increase the size of the Commission. As a consequence, the size of the Commission has steadily grown; it was 22 in 1996, 24 in 2001 and 25 in 2006. It is likely that the size of the Commission will stay at 25 in the future; see Press Release, ‘Seabed Council continues discussion of size and composition of Authority’s Expert Body – the Legal and Technical Commission’, Document SB/16/10, 30 April 2010.
67 UNCLOS, Article 163(6).
68 Part XI Agreement, Annex, Section 1, para. 2.
69 Part XI Agreement, Annex, Section 1, para. 4.
70 Part XI Agreement, Annex, Section 6.
71 UNCLOS, Article 162(2)(y) mandated the Council to establish a subsidiary organ to deal with financial matters.
72 Part XI Agreement, Annex, Section 9, para. 3.
financial affairs of the organization. In addition, the Committee shall include at least one member from each of the ‘chambers’ represented in the Council. In electing other Members of the Finance Committee, the Assembly shall take into account the need for equitable geographical representation. Whilst the Finance Committee has no primary decision-making powers under the Convention, the Part XI Agreement makes clear that decisions having financial or budgetary implications shall be based on the recommendations of the Finance Committee. Therefore, the Committee wields significant power over certain types of decisions made by the Authority.

2.4 Sources of Law in the International Seabed Mining Regime

a) Treaties

The 1982 Convention, as modified by the 1994 Agreement, acts both as the constituent instrument for the Authority, as well as containing a number of detailed rules concerning the manner in which mining on the deep seabed is to be carried out. These treaty rules are what one may call the ‘primary legislation’ of the Part XI regime and the Authority and the States Parties are directly bound by the treaty rules. Formal amendments may be introduced to the treaty framework in accordance with the provisions in Article 314 of the Convention. Yet, these procedures make it difficult to alter the legal framework and they favour the status quo. In addition, the Convention introduces special protection for the principle of the common heritage of mankind, which may not be amended at all.

b) Regulations

It was never anticipated that the Convention would contain all the rules relevant to seabed mining. Rather, ‘it was intended that the legal regime should develop gradually over time as

---

73 Part XI Agreement, Annex, Section 9, para. 3. This privilege only exists as long as the administrative costs of the Authority are funded by assessed contributions.
74 Part XI Agreement, Annex, Section 9, para. 3.
75 Part XI Agreement, Annex, Section 3, para. 7. There is a question over the interpretation of the phrase ‘based on.’ Similar language is found in other parts of the Convention, i.e. Article 76(8) which says that ‘the limits of the continental shelf established by a coastal state on the basis of [the recommendations of the Commission on the Outer Limits of the Continental Shelf] shall be final and binding.’ For a discussion of the interpretation of this provision, see T. McDorman, ‘The Role of the Commission on the Limits of the Continental Shelf: A Technical Body in a Political World’, (2002) 17 IJMCL 301, 314; Committee on Legal Issues of the Outer Limits of the Continental Shelf, in Report of the Seventy First Conference (International Law Association, 2004) 803.
76 UNCLOS, Article 134.
77 UNCLOS, Article 314; see also Article 316(5).
78 See Harrison (n42) 131-134.
79 UNCLOS, Article 311(6).
knowledge of the deep seabed expands.\textsuperscript{80} To this end, the Authority was given the power to adopt a variety of rules and regulations to deal with all aspects of prospecting, exploration, and exploitation of polymetallic nodules and other deep sea mineral resources located in the Area, including regulations relating to the prevention and control of pollution\textsuperscript{81}, the protection and conservation of natural resources in the Area\textsuperscript{82}, the protection of human life\textsuperscript{83}, and the erection, emplacement or removal of installations for the purpose of pursuing mining activities in the Area.\textsuperscript{84} These regulations form what one could call ‘secondary legislation’\textsuperscript{85}, which provides the specific rules concerning the conduct of seabed activities beyond national jurisdiction.

In order to safeguard the interests of all states, the power of the Authority to adopt rules, regulations and procedures is subject to a complex set of decision-making procedures. The standard setting process starts with the Legal and Technical Commission, which drafts proposals for further consideration by the Council.\textsuperscript{86} The Council undertakes a detailed scrutiny of the draft regulations and it may make any modifications to the draft regulations it considers appropriate. As noted above, the Council has a limited membership, but it is explicitly under an obligation to ‘seek to promote the interests of all members of the Authority.’\textsuperscript{87} Under Article 161(8)(d) of the Convention, the Council must adopt any rules or regulations by consensus, that is, with the agreement of all Council members.\textsuperscript{88} Given the representative composition of the Council, any decision to adopt regulations should therefore be guaranteed to take into account a cross-section of interests. Once the proposed regulations have been adopted by the Council they are sent to the Assembly for approval. A two-thirds majority of the Assembly is necessary in order to approve the proposal from the Council, although it will first attempt to achieve consensus on the issue.\textsuperscript{89} This stage would appear in

\begin{itemize}
\item \textsuperscript{80} Harrison (n42) 116.
\item \textsuperscript{81} UNCLOS, Articles 145 and 209. Article 209 requires States to adopt national laws which are at least as effective as the rules adopted by the Authority. See also Article 214.
\item \textsuperscript{82} UNCLOS, Articles 145 and 209. Article 209 requires States to adopt national laws which are at least as effective as the rules adopted by the Authority. See also Article 214.
\item \textsuperscript{83} UNCLOS, Article 146.
\item \textsuperscript{84} UNCLOS, Article 147.
\item \textsuperscript{85} Bastos (n13) 135.
\item \textsuperscript{86} See UNCLOS, Article 165.
\item \textsuperscript{87} Part XI Agreement, section 3, at para. 5.
\item \textsuperscript{88} Rule 59 of the Rules of Procedure of the Council defines consensus as ‘the absence of any formal objection.’ However, consensus in this context appears to have a different meaning to the use of the word in the other sections of Part XI as there are no alternative rules on voting which apply in the absence of consensus. Rather, it would appear that the procedure comes closer to unanimity than to consensus as it is understood in other contexts.
\item \textsuperscript{89} See Rule 61 of the Rules of Procedure of the Assembly.
\end{itemize}
practice to be a mere formality and the Assembly carries out little substantive scrutiny of the proposed regulations. Amendments to Regulations are adopted using the same procedures.

To date, the Authority has adopted Regulations on Prospecting and Exploration for Polymetallic Nodules, Polymetallic Sulphides, and Cobalt-Rich Crusts. It is these regulations that collectively form the core component of the legal regime for deep seabed mining, supplementing the provisions of the Convention. They are informally referred to as the Deep Seabed Mining Code.

These regulations are automatically binding on all Members of the Authority and there is no ability for individual states to opt-out of rules with which they disagree. This power to adopt binding rules and regulations differentiates the Authority from many other international organizations whose standard-setting powers usually depend upon the subsequent consent of states. It further emphasizes the importance of the decision-making procedures, discussed above, in balancing the various interests involved in the deep seabed mining regime. It is also notable that the rules may be enforced against Member States by the Authority. The Seabed Disputes Chamber of the International Tribunal for the Law of the Sea is given compulsory jurisdiction over disputes arising between the Authority and Member States concerning ‘acts or omissions of the Authority or of a State Party alleged to be in violation of [Part XI] or the Annexes relating thereto or of rules, regulations and procedures of the Authority adopted in accordance therewith.’ Such a centralized enforcement machinery is also incredibly rare in international law and is another feature which sets the Authority aside from most other international organizations.

90 For a more detailed analysis of these decision-making procedures, see Harrison (n43) 124-127.
91 Decision of the Assembly on the regulations for exploration and exploitation for polymetallic nodules in the Area, Document ISBA/6/A/18, 13 July 2000. See also Decision of the Assembly of the International Seabed Authority regarding the amendments to the Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area, Document ISBA/19/A/9, 25 July 2013; Decision of the Assembly of the International Seabed Authority relating to amendments to regulation 21 of the Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area, Document ISBA/20/A/9, 24 July 2014.
92 Decision of the Assembly of the International Seabed Authority relating to the regulations on prospecting and exploration for polymetallic sulphides in the Area, Document ISBA/16/A/12/Rev.1, 7 May 2010. See also Decision of the Assembly of the International Seabed Authority relating to amendments to regulation 21 of the Regulations on Prospecting and Exploration for Polymetallic Sulphides in the Area, Document ISBA/20/A/10, 24 July 2014.
95 See also Law of the Sea Convention, Articles 208 and 209.
97 UNCLOS, Article 187(b)(i). See also Article 189.
Another remarkable feature of the Regulations adopted by the Authority is that they are also applied directly to private actors carrying out activities in the Area through incorporation into contracts. The standard clauses for contracts to explore the Area stipulate that ‘the Contractor shall carry out exploration within the terms and conditions of the contract, the Regulations, Part XI of the Convention, the Agreement and other rules of international law not incompatible with the Convention.’ The Authority is given the ability to bring proceedings against contractors for failure to comply with their legal obligations under the Convention or the Regulations.

A challenge for the legal framework is to make sure that the evolving rules and regulations are applied fairly to all contractors. In accordance with general principles of contract law, Article 19(2) of Annex III of the Convention makes clear that ‘any contract entered into in accordance with [the Convention] may be revised only with the consent of the parties.’ Thus, it is necessary to negotiate changes to contracts on a case-by-case basis. In these circumstances, the contractor is likely to retain a strong position in negotiations and amendments to regulations cannot be imposed on existing contractors against their will.

This has become a practical problem ever since the decision of the Authority to introduce a standing charge for all contractors to cover the costs of administration and supervision of contracts. The Authority adopted amendments to the standard terms of contracts to this effect in 2013, and some contractors have consented to amend their contracts to include the new charges. However, the Council has ‘expressed concern about the fact that some contractors had not yet accepted the new standard clauses on overhead charges.’ The Secretary-General was requested to ‘find ways to ensure that the decision of the Assembly on overhead charges is implemented on the same footing.’ In practice, however, the consent of all contractors is necessary.

---

98 See e.g. Polymetallic Nodules Regulations, Annex 4, Section 13.1.
99 UNCLOS, Article 187(c).
100 This provision has been implemented in section 24.2 of the current standard terms of contract which provides that a contract “may also be revised by agreement between the Contractor and the Authority to facilitate the application of any rules, regulations and procedures adopted by the Authority subsequent to the entry into force of this contract.”
101 This opinion is supported by the Secretariat; see Review of outstanding issues with respect to the draft regulations on prospecting and exploration for polymetallic sulphides in the Area, Document ISBA/14/C/4, 8 April 2008, para. 32.
102 It has been suggested that contractors themselves should be permitted to request a review of relevant regulations; see ibid., at para. 33.
103 Decision of the Assembly of the International Seabed Authority concerning overhead charges for the administration and supervision of exploration, Document ISBA/19/A/12, 25 July 2013. See below for discussion.
contractors will be necessary to achieve this result and there is no way in which the Authority can force contractors to change the terms of the regulatory structure into which they entered.

c) Recommendations
As well as developing the regulatory framework for deep seabed mining through binding regulations, the Authority has also used non-binding instruments to this end. The adoption of non-binding instruments is expressly envisaged by the Regulations as a means of developing the regulatory framework of deep seabed mining. The Commission issued its first set of recommendations relating to environmental baseline studies in 2002, based on the outcomes of a workshop convened by the Authority in June 1998. These recommendations aim to define the biological, chemical, geological and physical components to be measured by the contractors in order to ensure the effective protection of the marine environment. They define the type of data that a contractor should gather in order to perform its duties under the Regulations. They also set out which activities require prior environmental impact assessment and monitoring programmes and they specify some of the measurements and observations that the contractor should make both during and after performing a specific activity. These recommendations have since been updated to take into account scientific developments in the field, as well as to apply them to the other mineral resources under exploration in the Area. The Commission has also adopted recommendations on the

---

106 See e.g. Sulphides Regulations, Reg. 41.
107 See Recommendations for the guidance of the contractors for the assessment of the possible environmental impacts arising from exploration for polymetallic nodules in the Area, Document ISBA/7/LTC/1/Rev.1, 13 February 2002. The Council took note of the recommendations and said that further consideration should take be given to them at a future session; see Statement of the President on the work of the Council at the seventh session, Document ISBA/7/C/7, 12 July 2001, para. 9.
109 Recommendations for the guidance of contractors for the assessment of the possible environmental impacts arising from exploration for polymetallic nodules in the Area, Document ISBA/16/LTC/7, 2 November 2010; Recommendations for the guidance of contractors for the assessment of the possible environmental impacts arising from exploration for marine minerals in the Area, Document ISBA/19/LTC/8, 1 March 2013.
reporting of expenditures and on developing training programmes under work plans for exploration.

Whilst recommendations are, by their very nature, non-binding, they represent an important indication of what is expected in relation to seabed mining. Indeed, the fact that recommendations are drafted and adopted by the same body that initially determines whether contractors are complying with their obligations under the Convention suggests that they carry significant influence, despite their formal status.

3. The Regulation of Seabed Mining

3.1 The nature and scope of activities in the Area
Activities in the Area are carried out in three distinct phases and a different regulatory framework applies to each phase.

a) Prospecting
Firstly, entities can carry out prospecting for seabed resources in the Area. Prospecting is defined as ‘the search for deposits of [resources] in the Area, including estimation of the composition, size and distribution of deposits of [resources] and their economic values, without any exclusive rights.’ The ultimate purpose of prospecting is to identify parts of the Area that are worthy of commercial exploration and exploitation.

Prospecting can be carried out in any part of the Area, provided there are no pre-existing contracts of exploration or exploitation for the resources that is being prospected. Given that prospecting entails no exclusive rights, it follows that ‘prospecting may be conducted simultaneously by more than one prospector in the same area or areas.’ There is no requirement of authorization to carry out prospecting. However, any prospector must notify the Authority of its intention to carry out prospecting and it must provide a written undertaking that it will comply with the Convention and the relevant rules, regulations and

---

110 Recommendations for the guidance of contractors for the reporting of actual and direct exploration expenditures as required by annex 4, section 10, of the Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area, Document ISBA/15/LTC/7, 25 May 2009.
111 Recommendations for the guidance of contractors and sponsoring States relating to training programmes under plans of work for exploration, Document ISBA/19/LTC/14, 12 July 2013.
112 Sulphides Regulations, Reg. 1(3)(e).
113 Sulphides Regulations, Reg. 2(3)
114 UNCLOS, Annex III, Article 2(2).
procedures of the Authority.\textsuperscript{115} This procedure allows the Authority to police prospecting in the Area and to ensure that prospecting is not carried out in a way that may be to the detriment of other contractors\textsuperscript{116} or the marine environment.\textsuperscript{117}

\textit{b) Exploration}

The next phase of activity is called exploration, which is defined as searching for deposits of [mineral resources] in the Area with exclusive rights, the analysis of such deposits, the use and testing of recovery systems and equipment, processing facilities and transportation systems, and the carrying out of studies of the environmental, technical, economic, commercial and other appropriate factors that must be taken into account in exploitation.\textsuperscript{118} This is a more in-depth exercise than prospecting and it entails significant expenditure on the part of the explorer. To reflect this fact, the Convention allows interested parties to apply for exclusive rights.\textsuperscript{119}

\textit{c) Exploitation}

The final phase of activity is called exploitation, which is defined as the recovery for commercial purposes of [mineral resources] in the Area and the extraction of minerals therefrom, including the construction and operation of mining, processing and transportation systems, for the production and marketing of metals.\textsuperscript{120} As noted by the Seabed Disputes Chamber, [t]hese activities include: drilling, dredging, coring, and excavation; disposal, dumping and discharge into the marine environment of sediment, wastes or other effluents; and construction and operation or maintenance of installations, pipelines and other devices related to such activities.\textsuperscript{121} This is the phase in which commercial production commences. There are a variety of techniques that may be used by mining companies in order to bring the minerals to the surface. The most common method is likely to involve the separation of the minerals from the seabed and their transportation to the surface through a pumping mechanism. The deposits from the seabed will be placed onboard a processing vessel, where

\begin{footnotes}
\footnotetext{115}{Law of the Sea Convention, Annex III, Article 2. See also Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area, Document ISBA/6/A/18, 4 October 2000, Part II; Sulphides Regulations, Reg. 3.}
\footnotetext{116}{Sulphides Regulations, Reg. 4(3).}
\footnotetext{117}{For the environmental regulation of prospecting, see below.}
\footnotetext{118}{Crusts Regulations, Reg. 1(3)(c).}
\footnotetext{119}{See below.}
\footnotetext{120}{Sulphides Regulations, Reg. 1(3)(a).}
\footnotetext{121}{Seabed Disputes Chamber of the International Tribunal for the Law of the Sea, Responsibility and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area, Advisory Opinion of 1 February 2011, para. 87.}
\end{footnotes}
excess water will be removed and returned to the ocean. The deposits will then be further processed before being transshipped to a cargo vessel for transport to shore. The Authority is responsible for regulating all of these activities, both at the seabed and at the surface, up to the point at which resources are transferred to a vessel for transportation to land.\textsuperscript{122}

### 3.2 Types of Contractors

Applications may be made to the Authority for exclusive rights to carry out exploration or exploitation activities in relation to a particular type of mineral resources. There are four types of entity, which are eligible to carry out activities in the Area.\textsuperscript{123}

#### a) The Enterprise

Firstly, applications may be made by the Enterprise, an organ of the Authority which was intended to directly carry out mining activity on behalf of the international community.\textsuperscript{124} However, the Part XI Agreement essentially suspends the establishment of the Enterprise for the foreseeable future, stating that ‘the Secretariat of the Authority shall perform the functions of the Enterprise until it begins to operate independently of the Secretariat.’\textsuperscript{125} These functions are initially restricted to monitoring trends in seabed mining and the collation of relevant information.\textsuperscript{126}

The Part XI Agreement also provides that ‘the Enterprise shall conduct its initial deep seabed mining operations through joint ventures.’\textsuperscript{127} The Part XI Agreement envisions that the Authority will have to make a decision on the functioning of the Enterprise at the time when it receives a request for joint venture with a commercial operator.\textsuperscript{128} Such a decision must be based upon ‘sound commercial principles.’\textsuperscript{129} At the nineteenth session of the Authority in 2013, the Council determined, in response to an inquiry by a mining contractor as to the possibility of a joint venture\textsuperscript{130}, that it was ‘premature’ for the Enterprise to function independently.\textsuperscript{131} Indeed, it is possible that Members will never authorize the autonomous

\textsuperscript{122} Ibid., paras 95-96.
\textsuperscript{123} UNCLOS, Article 153. Repeated verbatim in Regulation 9 of the Polymetallic Nodules Regulations and Regulation 9 of the Polymetallic Sulphides Regulations.
\textsuperscript{124} UNCLOS, Article 170 and Annex IV.
\textsuperscript{125} Part XI Agreement, Annex, Section 2, para. 1.
\textsuperscript{126} Ibid..
\textsuperscript{127} Part XI Agreement, Annex, Section 2, para. 2.
\textsuperscript{128} Ibid..
\textsuperscript{129} Ibid., para. 2.
\textsuperscript{130} See Proposal for a joint venture with the Enterprise, Document ISBA/19/C/4, 20 March 2013.
\textsuperscript{131} Statement on the work of the Council during the nineteenth session, Document ISBA/19/C/18, 24 July 2013, para. 16.
functioning of the Enterprise and the Part XI Agreement removes the positive obligation of States Parties to fund mine sites of the Enterprise.\textsuperscript{132} If the Enterprise does come into operation, the Part XI Agreement makes it clear that it shall not have any commercial advantage over other contractors and that it shall be subject to the same regulatory framework.\textsuperscript{133}

\textit{b) States Parties}

The Convention provides that States Parties may directly apply to carry out activities in the Area. Currently, South Korea, India and the Russian Federation have obtained such authorization. The Government of Korea and the Government and India were both registered as so-called pioneer investors, as they had committed significant sums into the development of seabed mining prior to the entry into force of the 1982 Convention.\textsuperscript{134} Thus, they entered into contracts for the exploration of polymetallic nodules upon the adoption of the appropriate regulations by the Authority. Both states have since entered into further contracts for the exploration of polymetallic sulphides.\textsuperscript{135} The Russian Federation\textsuperscript{136} is another state that has expressed a keen interest in seabed mining and it has entered into contracts for the exploration of polymetallic sulphides\textsuperscript{137} and cobalt-rich ferromanganese crusts.\textsuperscript{138}

\textit{c) State Enterprises}

Many other states have chosen to carry out seabed activities through the vehicle of a state enterprise. Indeed, this is the largest category of contractors at present. There is no definition of a state enterprise in the Convention, although their common feature is that they are owned and controlled by the sponsoring states. Several of these entities qualified as pioneer

\footnotesize{\textsuperscript{132} Part XI Agreement, Annex, Section 2, para. 3.  
\textsuperscript{133} Part XI Agreement, Annex, Section 2, para. 4.  
\textsuperscript{135} Decision of the Council relating to an application for approval of a plan of work for exploration for polymetallic sulphides by the Government of the Republic of Korea, Document ISBA/18/C/24, 26 July 2012 (the contract is yet to be signed); Decision of the Council relating to an application for the approval of a plan of work for exploration for polymetallic sulphides by the Government of India, Document ISBA/20/C/26, 21 July 2014 (the contract is yet to signed).  
\textsuperscript{136} Decision of the Council relating to an application for approval of a plan of work for exploration for polymetallic sulphides by the Government of the Russian Federation, Document ISBA/17/C/17, 19 July 2011.  
\textsuperscript{137} Decision of the Council relating to an application for approval of a plan of work for exploration for polymetallic sulphides by the Government of the Russian Federation, Document ISBA/17/C/17, 19 July 2011.  
\textsuperscript{138} Decision of the Council relating to an application for the approval of a plan of work for exploration for cobalt-rich ferromanganese crusts by the Ministry of Natural Resources and Environment of the Russian Federation, Document ISBA/20/C/24, 21 July 2014.}
investors under the arrangements agreed by the Preparatory Commission, namely the Interoceanmetal Joint Organization, Yuzhmorgeologiya, China Ocean Mineral Resources Research and Development Association, Deep Ocean Resources Development Ltd, and Institut Francais de Recherche Pour L’Exploitation de la Mer. Several of the pioneer investors have subsequently sought additional contracts with the Authority. For example, the China Ocean Mineral Resources Research and Development Association has entered into contracts for the exploration of polymetallic sulphides and cobalt-rich ferromanganese crusts. Similarly, the Institut Francais de Recherche Pour L’Exploitation de la Mer has obtained a contract for the exploration of polymetallic sulphides. Since the entry into force of the Convention, several additional contracts have been awarded to state enterprises or companies effectively controlled by states, including the Federal Institute for Geosciences and Natural Resources for Germany, the Japan Oil, Gas and Metals National Corporation, Marawa Research and Exploration Ltd, Nauru Ocean Resources Inc, the Cook Islands Investment Corporation, and Companhia de Pesquisa de Recursos Minerais.

139 See Churchill and Lowe (n134) 236-237.
141 Decision of the Council relating to an application for approval of a plan of work for exploration for cobalt-rich ferromanganese crusts by the China Ocean Mineral Resources Research and Development Association, Document ISBA/19/C/13, 19 July 2013. The contract for exploration entered into force on 29 April 2014.
142 Decision of the Council relating to an application for approval of a plan of work for exploration for polymetallic sulphides by the Institut français de recherche pour l’exploitation de la mer, Document ISBA/18/C/26, 26 July 2012. The contract has yet to be signed.
146 Decision of the Council relating to a request for approval of a plan of work for exploration for polymetallic nodules submitted by Marawa Research and Exploration Ltd, Document ISBA/18/C/25, 26 July 2012. The entity is controlled by the Republic of Kiribati. The contract of exploration is yet to be signed.
149 Decision of the Council relating to an application for the approval of a plan of work for exploration for cobalt-rich ferromanganese crusts by Companhia de Pesquisa de Recursos Minerais, Document ISBA/20/C/30, 21 July 2014.
**d) Private contractors**

The final category of entities which may apply to carry out activities in the Area are ‘natural or juridical persons which possess the nationality of States Parties or are effectively controlled by them or their nationals, when sponsored by such States.’

This category covers either private corporations or public-private partnerships. Demonstrating the increased interest in deep seabed mining as a commercial venture, there have been a number of private corporations that have applied for contracts with the Authority in the last few years, including G-TEC Sea Mineral Resources from Belgium, UK Seabed Resources from the United Kingdom, Tonga Offshore Mining Limited, and Ocean Mineral Singapore Pte Ltd from Singapore.

To make the determination of nationality possible, the Regulations require an applicant to provide ‘sufficient information to determine the nationality of the applicant.’

It would appear that the registration of a company in a State Party is sufficient to satisfy the conditions of the Convention. For example, the application of UK Seabed Resources Ltd was accepted by the Authority, even though it was a wholly-owned subsidiary of Lockheed Martin UK Holdings Ltd, which in turn is a wholly-owned subsidiary of Lockheed Martin, a corporation with the nationality of a non-State Party, namely the United States. In other words, the Authority is not concerned with piercing the corporate veil of a corporation in order to determine its corporate nationality, provided that the sponsoring state can demonstrate that it exercises effective authority over the company concerned.

All applications must be ‘accompanied by a certificate of sponsorship issued by the State of which it is a national or by which or by whose nationals it is effectively controlled.’ In the case of a consortium of operators, a certificate of sponsorship is

---

149 UNCLOS, Article 153(2)(b).
152 Decision of the Council relating to a request for approval of a plan of work for exploration for polymetallic nodules submitted by Tonga Offshore Mining Limited, Document ISBA/17/C/15, 19 July 2011. Tonga Offshore Mining is a subsidiary of Nautilus Minerals Incorporated, which itself has a number of shareholders including Teck Cominco, AngloAmerican and Gazmetall.
154 Nodules Regulations, Reg. 10(3)(a); Sulphides Regulations, Reg. 10(3)(a).
155 Nodules Regulations, Reg. 11(1); Sulphides Regulations, Reg. 11(1).
required from each state involved in a consortium. The sponsoring state plays an important role in the regulation of seabed mining as they have to put in place a legal framework in national law that ensures that individual contractors ultimately comply with the regulations and decisions relating to deep seabed mining.

3.3 The Approval Process

Potential contractors are required to submit an application for the approval of a plan of work for exploration to the Authority in accordance with the conditions contained in the applicable regulations. The Convention, as modified by the Part XI Agreement, sets out a strict and carefully designed decision-making process for dealing with applications.

In the first place, applications are considered by the Legal and Technical Commission, whose task it is to advise on whether or not the applicants meet the financial and technical requirements of the Convention and requisite regulations. The Commission considers such applications in closed session and it generally invites a representative of the applicant to come and present the application. This allows the applicant to clarify certain issues of a technical nature and to respond to specific queries. The Commission reports to the Council, and it is the latter that has the final say on the approval of plans of work. However, the discretion of the Council is also restricted by the provisions of the Part XI Agreement. Thus, ‘the Council shall approve a recommendation by the [Commission] for approval of a plan of work unless by a two-thirds majority of its members present and voting, including a majority of members present and voting in each of the chambers of the Council, the Council decides to disapprove a plan of work.’ In practice, the decision-making procedure makes it very difficult for the Council to overturn recommendations made by the Commission. Moreover, the Part XI Agreement requires the Council to take a decision within a prescribed time period, thus preventing the Council from delaying applications. Both of these innovations in the decision-making procedure are intended to remove the politics from what are perceived to be decisions of a purely technical nature.

---

156 Nodules Regulations, Reg. 11(1); Sulphides Regulations, Reg. 11(1).
157 See UNCLOS, Article 139 and Annex III, Article 4(4). For an interpretation of these provisions, see Seabed Disputes Chamber of the International Tribunal for the Law of the Sea (n121).
158 UNCLOS, Article 165(2)(b) which makes clear that the Commission shall ‘base its recommendations solely on the grounds stated in Annex III and shall report fully thereon to the Council.’
159 See e.g. Report and Recommendations to the Council relating to the application by the German Federal Institute for Geosciences and Natural Resources, Document ISBA/11/C/7, para. 3.
160 UNCLOS, Article 162(2)(j).
161 Part XI Agreement, Annex, Section 3, para. 11(a).
162 Ibid..
3.4 The Parallel System and the Reservation of Mining Sites

As originally drafted, the Convention envisaged a so-called parallel system of mining in the Area. Under this system, an application to undertake exploration activities was required to cover a total area sufficiently large to sustain two mining operations, one which was to be conducted by the contractor and the other which was to be reserved to the Authority itself.\(^\text{163}\) The purpose of this system was to give an opportunity to the Enterprise to carry out mining directly on behalf of the international community. Whilst the parallel system remains a part of the mining regime in the Area, a number of changes have been introduced to reflect the different approach to deep seabed mining that was agreed in the negotiations of the Part XI Agreement.

Firstly, as noted above, the Part XI Agreement specifies that the initial deep seabed mining of the Enterprise should be conducted ‘through joint ventures.’\(^\text{164}\) Moreover, it goes on to say that ‘a contractor which has contributed a particular area to the Authority as a reserved area has the right of first refusal to enter into a joint-venture arrangement with the Enterprise for exploration and exploitation of that area.’\(^\text{165}\) In other words, the right of the Enterprise to independently submit applications for plans of work has been drastically curtailed by the new arrangements.\(^\text{166}\)

It is not only the Enterprise that can carry out activities in reserved areas, however. Article 9(4) of the Annex III of the Convention also allows ‘any state party which is a developing state or any natural or juridical person sponsored by it and effectively controlled by it or by another developing state which is a qualified applicant’ to notify the Authority that they submit a plan of work with respect to a reserved area. Such a notification is forwarded to the Enterprise, which must indicate whether it intends to carry out activities in that particular reserved area.\(^\text{167}\) The Enterprise has six months in which to make a decision. To date, three applications in relation to reserved areas have been made by mining companies based in or controlled by developing countries.\(^\text{168}\)

Finally, the Part XI Agreement puts a time limit on the period for which areas can be reserved. It provides that ‘[i]f the Enterprise does not submit an application for a plan of work

\(^{163}\) UNCLOS, Annex III, Article 8; Part XI Agreement, Annex, Section 1, para. 10.

\(^{164}\) Part XI Agreement, Annex, Section 2, para. 2.

\(^{165}\) Part XI Agreement, Annex, Section 2, para. 5.

\(^{166}\) These changes modify the provisions in the UNCLOS, Annex III, Article 9.

\(^{167}\) Sulphides Regulations, Reg. 18.

\(^{168}\) Tonga Offshore Mining; Marawa Research and Exploration Ltd; Nauru Ocean Resources Inc; Ocean Mineral Singapore Pte Ltd.
for activities in respect of such a reserved area within 15 years of the commencement of its functions independent of the Secretariat of the Authority or within 15 years of the date on which that area is reserved for the Authority, whichever is later, the contract which contributed the area shall be entitled to apply for a plan of work for that area provided it offers in good faith to include the Enterprise as a joint-venture partner.\(^{169}\)

### 3.5 Equity Interests

Developments in the regulatory regime since the establishment of the Authority have also led to an alternative model of securing the interests of the international community in deep seabed mining. This alternative model has arisen because of the difference in the characteristics of the mineral resources that have been discovered in the Area since the negotiation of the regime. The former Secretary-General has explained that ‘the localised nature of the deposits [of sulphides and crusts] [means] there will be differences relating \textit{inter alia} to the size of the area allocated for exploration under the contract, the size of the eventual exploitation area and the system for participation by the Authority...’\(^{170}\) Rather than demanding the application of the parallel system in this context, the Authority has developed an alternative method of participation for the international community in seabed mining for sulphides or crusts. In these cases, the Regulations permit applicants wishing to undertake exploration for resources to choose between either nominating a reserved area or offering an equity interest in the joint venture to the Enterprise.\(^{171}\) Under this second option, there is no area that is reserved to the Authority for future exploration and exploitation. Instead, the Enterprise is to obtain, without payment, a minimum of twenty per cent of the equity in the joint venture arrangement although it will only be entitled to profits on half of its equity participation until the applicant has recovered its total equity participation in the joint venture arrangement.\(^{172}\) The Enterprise will also be entitled to purchase a further thirty per cent of the equity participation in the joint venture if it elects to do so.\(^{173}\) Thus, the Enterprise could in theory obtain up to half of the shares of a company involved in mining for polymetallic

\(^{169}\) Part XI Agreement, Annex, Section 2, para. 5.
\(^{171}\) Sulphides Regulations, Reg. 19; Crusts Regulations, Reg. 19.
\(^{172}\) Ibid..
\(^{173}\) Ibid..
sulphides. Shares of the Enterprise will be treated the same as other shares in the joint venture. It would appear that several contractors have taken advantage of this opportunity.\textsuperscript{174}

3.6 Fees, Royalties and the Equitable Sharing of Benefits

According to the Part XI Agreement, the financial terms of contracts should follow a number of key principles:\textsuperscript{175}

i. the system of payments should be simple and fair to both the contractor and the Authority;

ii. the rate of payments should be within the range of those prevailing in respect of land-based mining of the same or similar minerals;

iii. the system should be revised periodically in the light of changing circumstances.

There are two types of fees anticipated under the regulatory regime. Firstly applicants are required to pay an administrative fee to cover the costs of processing the application. To this end, applicants are required to submit a fee to the Authority of US$500,000 at the time of the application.\textsuperscript{176} Although this is described as ‘a fixed fee’, the regulations make clear that ‘if the administrative costs incurred by the Authority in processing an application are less than the fixed amount (...) the Authority shall refund the difference.’\textsuperscript{177} At the same time, if the administrative costs are more than the initial fee, contractors must pay the difference subject to a cap of US$50,000. In 2012, prompted by the rising costs of supervising contracts, the Assembly adopted amendments to the regulations, which call for an additional annual fee of US$47,000.\textsuperscript{178} This decision emphasizes the importance attached to cost-effectiveness and the willingness to avoid a situation whereby states were subsidizing mining contractors.\textsuperscript{179}

\textsuperscript{174} See e.g. Report and recommendations of the Legal and Technical Commission to the Council of the International Seabed Authority relating to an application for the approval of a plan of work for exploration for polymetallic sulphides by the Federal Institute for Geosciences and Natural Resources on behalf of the Federal Republic of Germany, Document ISBA/20/C/16, 9 July 2014; Report and recommendations of the Legal and Technical Commission to the Council of the International Seabed Authority relating to an application for the approval of a plan of work for exploration for cobalt-rich ferromanganese crusts by Companhia de Pesquisa de Recursos Minerais, Document ISA/20/C/17, 9 July 2014. Neither of these documents refer to an area to be reserved to the Authority.

\textsuperscript{175} Part XI Agreement, Annex, Section 8, para. 1.

\textsuperscript{176} Nodules Regulations, Reg. 19(1); Sulphides Regulations, Reg. 21(1)(a); Crusts Regulations, Reg. 21(2).

\textsuperscript{177} Crusts Regulations, Reg. 21(2).

\textsuperscript{178} Decision of the Assembly concerning overhead charges for the administration and supervision of exploration contracts, Document ISBA/19/A/12, 25 July 2013.

\textsuperscript{179} See Report of the Secretary-General to the 19th Session of the Authority, Document ISBA/19/A/2, 22 May 2013, paras 65-66.
Ultimately it is anticipated that contractors will also pay an annual fee from the date of commencement of commercial production.\textsuperscript{180} One of the issues to be addressed by the Authority in drawing up regulations for the exploitation of resources will be the nature of fees to be paid by contractors during this phase. In its preparatory work on the subject, the Secretariat has noted that ‘the Authority faces the challenge of developing an exploitation framework that ensure that the exploitation (…) will (a) benefit mankind as a whole (including future generations) and (b) foster commercially viable and sustainable exploitation (including reasonable economic returns) of the Area’s mineral resources.’\textsuperscript{181} The Secretariat’s report envisages a form of royalty payment and it highlights a number of different possibilities, including ‘(a) unit-based royalties based on units of volume or weight; (b) ad valorem royalties based on value of sales; (c) hybrid royalties; and (d) profit-based royalties.’\textsuperscript{182} It remains to be seen which model will be selected by the Authority.

The significance of these fees is that they will be distributed in a manner that will be to the benefit of mankind as a whole, in order to achieve the objective of ‘equitable sharing of the financial and other benefits derived from activities in the Area.’\textsuperscript{183} Thus, the Authority is also charged with designing an ‘appropriate mechanism’ for the distribution of benefits ‘on a non-discriminatory basis.’\textsuperscript{184}

Another aspect of benefit sharing under the Part XI regime is the transfer of technology, which was another controversial issue in the negotiation of the Convention. The original provisions of the Convention have been substantially modified by the Part XI Agreement and the original obligation of contractors to make technology available on ‘fair and reasonable commercial terms and conditions whenever the Authority so requests’\textsuperscript{185} has been replaced by a more general duty to ‘cooperate (…) in facilitating the acquisition of deep seabed mining technology (…) consistent with the effective protection of intellectual property rights.’\textsuperscript{186} This significantly weakens the original duty and the extent to which contractors are expected to share the benefits of seabed mining with the Authority or

\textsuperscript{180} Part XI Agreement, Annex, Section 8, para. 1(d). Initially, the Convention had anticipated an annual fixed fee of US$1 million from the commencement of commercial production, but this requirement has been disapproved by the Part XI Agreement; see Annex, Section 8, para. 2.
\textsuperscript{181} Towards the development of a regulatory framework for polymetallic nodule exploitation in the Area, Document ISBA/19/C/5, 25 March 2013, para. 5.
\textsuperscript{182} Towards the development of a regulatory framework for polymetallic nodule exploitation in the Area, Document ISBA/19/C/5, 25 March 2013, para. 15. The report notes that these different options promote administrative efficiency and economic efficiency to different degrees.
\textsuperscript{183} UNCLOS, Article 140(2).
\textsuperscript{184} UNCLOS, Article 140(2).
\textsuperscript{185} UNCLOS, Annex III, Article 5(3)(a). Disapproved by Part XI Agreement, Annex, Section 5, para. 2.
\textsuperscript{186} Part XI Agreement, Annex, Section 5, para. 1.
developing states wishing to carry out similar activities. However, this requirement was a crucial part of the compromise which facilitated the entry into force of the deep seabed mining regime and it therefore must be seen as part of the price to be paid for any benefits from seabed mining to accrue to the international community.

Another way in which contractors are expected to positively contribute to benefit sharing is through the provision of training and associated capacity-building activities. Contractors are required to draw up a ‘practical programme for the training of personnel of the Authority and developing States (...) [focusing on] training in the conduct of exploration.’\(^\text{187}\) In practice, such opportunities include at-sea training in sampling techniques and analysis, engineering training in using advanced technology and bursaries for further study.\(^\text{188}\)

The Authority has also established an endowment fund for marine scientific research in the Area.\(^\text{189}\) The endowment fund is aimed at promoting and encouraging the conduct of marine scientific research in the Area for the benefit of mankind as a whole and is particularly focused on ‘supporting the participation of qualified scientists and technical personnel from developing countries in marine scientific research programmes and by providing them with opportunities to participate in international technical and scientific cooperation.’\(^\text{190}\) To start off the endowment fund, the Authority donated the balance of the application fees paid by pioneer investors that was still remaining at 18 August 2006.\(^\text{191}\) It also called upon Members of the Authority, other states, relevant international organizations, academic scientific and technical institutions and private persons to make additional contributions to the fund to ensure that it can provide on-going support to developing countries.\(^\text{192}\) This is one of the more practical ways in which the Authority has promoted benefit sharing to date, independently of its explicit duties under the Convention.

4. Sustainable Development of Deep Seabed Resources

4.1 The Goal of Sustainable Development

\(^\text{187}\) UNCLOS, Article 144(2) and Annex III, Article 15.
\(^\text{188}\) See Considerations relating to the recommendations for the guidance of contractors and sponsoring States relating to training programmes under plans of work for exploration, Document ISBA/19/LTC/7, 22 January 2013.
\(^\text{189}\) Resolution establishing an endowment fund for marine scientific research in the Area, Document ISBA/12/A/11, 16 August 2006.
\(^\text{190}\) Ibid, para. 2.
\(^\text{191}\) Ibid, para. 3.
\(^\text{192}\) Ibid, para. 4.
It will now be clear that the original inspiration of the Part XI regime was to promote fair and equitable access to deep seabed resources. It follows that one of the principal objectives of the Authority is to promote the carrying out activities in the Area ‘in such a manner as to foster healthy development of the world economy and balanced growth of international trade.’ Yet, this is not the only consideration to be taken into account in overseeing the deep seabed mining regime. There is significant concern in some quarters about the impacts of seabed mining on the marine environment and particularly on rare and fragile deep seabed ecosystems. For example, Greenpeace has argued that ‘because deep-sea species live in rarely disturbed environments and tend to be slow growing and late maturing, with some unique to their particular habitat types (…) or even specific locations, they are highly vulnerable to disturbance or even extinction.’ They go on to highlight the potential impacts on deep seabed ecosystems, which includes not only direct damage to marine species and habitats but also pollution from sediment plumes, noise pollution, and light pollution.

The Authority has itself admitted that seabed mining will cause ‘inevitable environmental damage.’ Indeed, as part of its mandate, it is obliged to take ‘necessary measures (…) with respect to activities in the Area to ensure effective protection for the marine environment from harmful effects which may arise from such activities.’ Such measures include the adoption of rules for the prevention, reduction and control of pollution of the marine environment and the protection and conservation of the natural resources of the Area, including flora and fauna. The adoption of rules, regulations and procedures for the protection of the marine environment was one of the priority areas for the Authority identified by the Part XI Agreement.

In practice, the Authority will be required to balance the competing objectives of economic development and environmental protection. In doing so, it can be guided by the goal of sustainable development, a concept that is neatly captured by Principle 4 of the Rio Declaration on Environment and Development, according to which:

---

193 UNCLOS, Article 150.
194 Greenpeace, Deep Seabed Mining: An Urgent Wake-UP Call to Protect Our Oceans (July 2013) 3.
195 Ibid., 6-12. See also UNEP.
197 UNCLOS, Article 145.
198 Ibid. See also Article 209.
199 Part XI Agreement, Annex, Section 1, para. 5(g).
“In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.”

In other words, neither environmental protection nor economic development should be pursued in isolation, but rather they must be balanced against each other. Although there is no mention of sustainable development in the Convention, the Part XI Agreement or the Regulations, it is nevertheless a concept that can help to guide the work of the Authority in balancing its obligations to protect the environment and its objective of promoting the utilization of the resources of the Area. The decision-making procedures of the Authority, described in detail above, will play an important role in ensuring that all interests are taken into account in this balancing process. Yet, as will be seen below, it is likely that decisions about the sustainability of seabed mining will differ, depending upon the characteristics of the resource and the phase of activity. The following sections will outline the different ways in which the protection of the marine environment has already been taken into account by the Authority in its decision-making and what challenges remain.

4.2 Prospecting and the Protection of the Marine Environment
When undertaking prospecting, prospectors are under an obligation to protect the marine environment and they must inform the Secretary-General of any incident arising from prospecting which causes harm to the marine environment. Indeed it would appear that the Secretary-General may refuse to register the notification of an intention to carry out prospecting if the proposed area for prospecting includes any part of an area disapproved by the Council for exploitation because of the risk of serious harm to the marine environment. However, it is not clear what action the Authority can take against a prospector for failure to comply with such an undertaking. Disputes with prospectors are not explicitly mentioned in the jurisdiction of the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea. Moreover, as there is no requirement for a prospector to have a sponsoring state, whether or not a claim could be successfully pursued through national courts would

---

200 The concept of sustainable development has been described by Lowe as “a legal concept exercising a kind of interstitial normativity, pushing and pulling the boundaries of true primary norms when they threaten to overlap or conflict with each other.” See A.V. Lowe, ‘Sustainable Development and Unsustainable Arguments’, in A.E. Boyle and D. Freestone (eds), International Law and Sustainable Development (Oxford University Press, 1999) 31.
201 Nodules Regulations, Reg. 5(3); Sulphides Regulations, Reg. 5(3); Crusts Regulations, Reg. 5(3).
202 UNCLOS, Article 187.
depend on the relevant law of the state in which a prospector was based. That state may not be a party to the Convention and it may not even recognize the legal personality of the Authority to bring a claim. This could be seen as a significant weakness of the regime for prospecting as it currently stands.

4.3 The Environmental Obligations of Contractors

Environmental concerns are also at the core of the obligations of contractors undertaking exploration activities. Each set of regulations contains an entire part dedicated to the protection and preservation of the marine environment.

In the first place, the impact of a proposed project on the marine environment is a factor to be taken into account by the Commission and the Council when considering an application. To this end, contractors are required to carry out ‘a preliminary assessment of the possible impact of the proposed exploration activities on the marine environment’ and this information will be considered in the decision-making process. The Regulations suggest that contractors should in the first place manage such activities to prevent any significant harmful effects, but if management is not possible, activities should ‘not be authorized to proceed.’

This requirement is likely to be of greater significance at the time of exploitation seeing as the Council has an explicit power to ‘disapprove areas for exploitation by contractors or the Enterprise in cases where substantial evidence indicates the risk of serious harm to the marine environment.’ Indeed, the Council has provisionally approved the Clarion-Clipperton Environmental Management Plan, which identifies nine areas of particular environmental interest covering a range of deep seabed habitats. In accordance with this decision, ‘no application for approval of a plan of work for exploration or exploitation should be granted in [the] areas of particular environmental interest.’

Once a contract has been approved, contractors have an obligation to ‘take necessary measures to prevent, reduce and control pollution and other hazards to the marine environment arising from activities in the Area, as far as reasonably possible.’ For this

---

203 E.g. Crusts Regulations, Reg. 20(1)(c).
204 E.g. Crusts Regulations, Reg. 33(4).
205 UNCLOS, Article 162(2)(x).
206 Decision of the Council relating to an environmental management plan of the Clarion-Clipperton Zone, ISBA/18/C/22, 26 July 2012.
207 Decision of the Council relating to an environmental management plan of the Clarion-Clipperton Zone, (26 July 2012) ISBA/18/C/22, para. 5. This prohibition applies for a five-year period. For an analysis, see M. Lodge, ‘Some Legal and Policy Considerations Relating to the Establishment of a Representative Network of Protected Areas in the Clarion-Clipperton Zone’ (2011) 26 IJMCL 463.
208 Crusts Regulations, Reg. 33(5).
purpose, contractors are required to apply the ‘best environmental practices.’ This requirement sets out a minimum standard against which the actions of contractors can be judged. The advantage of referring to ‘best environmental practices’ is that it allows this standard to evolve over time as technology itself develops. The obligation to follow ‘best environmental practices’ was first included in the Sulphides Regulations and subsequently in the Crusts Regulations, but it was not contained in the original Nodules Regulations. This lacuna has been filled by an amendment to the Nodules Regulations adopted in 2013.

In addition, the Seabed Disputes Chamber in its 2012 Advisory Opinion suggested that ‘the Nodules Regulations should be interpreted in light of the development of the law, as evidenced by the subsequent adoption of the Sulphides Regulations,’ and they were of the view that the obligation of ‘best environmental practices’, at least in relation to sponsoring states, could be ‘read into’ the original Nodules Regulations.

Contractors are also under an obligation to continuously monitor the effect of their activities on the marine environment. To this end, contractors are expected to gather environmental baseline data against which to assess the likely effects of its activities. Impact reference zones may be used for this purpose. The Legal and Technical Commission has provided guidance for the assessment of possible environmental impacts arising from the exploration of marine minerals in the Area. Although such recommendations are by their very nature not legally binding, they must be taken seriously by contractors as they have been produced by the same body which is responsible for ensuring that contractors have complied with their obligations and the ‘best practice.’

The Seabed Disputes Chamber has also hinted that ‘the obligations of the contractors and of the sponsoring States concerning environmental impact assessments extend beyond the scope of application of specific provisions of the Regulations’, suggesting that rules of general international law on the topic may apply. Whilst this finding seeks to ensure as strong environmental protection as possible, the vagueness of international rules relating to

209 Crusts Regulations, Reg. 33(5).
210 Sulphides Regulations, Reg. 33(2).
211 Crusts Regulations, Reg. 33(2).
212 Nodules Regulations, Reg. 31(2) and (5).
213 Seabed Disputes Chamber of the International Tribunal for the Law of the Sea (n121) para. 137.
214 Crusts Regulations, Reg. 33(6).
215 Crusts Regulations, Reg. 34(1).
216 Crusts Regulations, Reg. 33(6).
217 Recommendations for the guidance of contractors for the assessment of the possible environmental impacts arising from exploration for marine minerals in the Area (n109).
218 See above.
219 Seabed Disputes Chamber of the International Tribunal for the Law of the Sea (n121) para. 150.
environmental impact assessment would not necessarily assist in helping to clarify what contractors or sponsoring states would be required to do. Indeed, the recent recommendations of the Commission provide a much better source in which to interpret and apply the obligations found in the Regulations.

Contractors may also be required to establish preservation reference zones as ‘areas in which no mining shall occur to ensure representative and stable biota of the seabed’, allowing an assessment of ‘any changes in biodiversity of the marine environment’. It may also be necessary to establish buffer zones around such preservation reference zones in order to ensure that they remain unaffected by other seabed activities. Similar environmental obligations are also likely to form a significant pillar of any future regime for the exploitation of seabed minerals, although there is likely to be a stronger emphasis on the monitoring and enforcement of such commitments once commercial exploitation commences.

The Regulations also contain rules relating to pollution emergencies that threaten to significantly harm the marine environment. All contractors must submit a contingency plan to the Secretary-General stating what measures will be taken in the event of an environmental emergency. If a contractor, through its activities in the Area, causes or is likely to cause serious harm to the marine environment, he must immediately warn other contractors and shipping operating in the vicinity. In addition, the contractor must notify the Secretary-General of the incident. The notification must include the coordinates of the area affected, a description of any action being taken by the contractor to prevent, contain or minimize any harm to the marine environment, and any supplementary information reasonably requested by the Secretary-General. In turn, the Secretary-General must notify the Legal and Technical Commission and the Council. The Council may issue emergency orders as may reasonably be thought necessary to prevent, contain and minimize serious harm to the marine environment. This was foreseen by the Convention which authorizes the Legal and Technical Commission to ‘make recommendations to the Council to issue emergency orders,

220 Crusts Regulations, Reg. 33(6).
221 See Towards the Development of a Regulatory Framework for Polymetallic Nodule Exploitation in the Area, Document ISBA/19/C/5, 25 March 2013, para. 11(e)(v).
222 The Convention foresees ‘a staff of inspectors who shall inspect Activities in the Area to determine whether this Part, the rules, regulations and procedures of the Authority, and the terms and conditions of any contract with the Authority are being complied with’; UNCLOS, Article 162(z).
223 See UNCLOS, Article 162(w).
225 Ibid..
226 Ibid., section 6.2.
227 Ibid., Reg. 33(2).
228 Ibid., Reg. 33(6).
which may include orders for the suspension or adjustment of operations, to prevent serious
harm to the marine environment arising out of activities in the Area.\footnote{UNCLOS, Article 165(2)(k).} However, the
Regulations also allow the Secretary-General of the Authority to take immediate measures to
prevent, contain or minimize the harm.\footnote{Nodules Regulations, Reg. 33(3).} This innovation prevents any potential delay in
responding to an environmental emergency. As a safeguard, any measures taken by the
Secretary-General are provisional and they will be effective for no longer than ninety days or
until the Council has decided what measures it wishes to impose, whichever is shorter.
Permanent measures should be adopted by the Council, taking into account the
recommendations of the Legal and Technical Commission.\footnote{Ibid., Reg. 33(6). See also UNCLOS, Article 162(2)(w).} The contractor must reimburse
the Authority for any expenses incurred in taking measures to respond to a pollution
emergency.\footnote{Nodules Regulations, supra, Annex 4, section 6.4.} This provision thus implements the so-called ‘polluter pays’ principle.\footnote{On the polluter pays principle, see P. Birnie, A.E. Boyle and C. Redgwell, *International Law and the
Environment* (3rd edn, Oxford University Press, 2009) 221-223.}

The sponsoring state plays a key role in ensuring that its nationals comply with these
environmental commitments, including making sure that any assurances made by the
contractor are enforceable through its national law.\footnote{UNCLOS, Article 235(2); Nodules Regulations, Reg. 33(8).} However, the sponsoring state does not
bear residual responsibility for the failure of contractors to protect the marine environment.\footnote{Seabed Disputes Chamber of the International Tribunal of the Law of the Sea (n121) para. 204.}

It follows that there may exist a liability gap if the contractor is unable to cover the costs of
any damages and the sponsoring state has fulfilled its due diligence responsibilities under the
Convention. To this end, the Seabed Disputes Chamber suggested that ‘the Authority may
wish to consider the establishment of a trust fund to compensate for the damage not
covered’\footnote{Ibid., para. 205.} although no action has been taken by the organs of the Authority to date.\footnote{See Decision of the Assembly of the International Seabed Authority relating to the advisory opinion of the
Seabed Disputes Chamber of the International Tribunal for the Law of the Sea on matters relating to the
responsibilities and obligations of States sponsoring persons and entities with respect to activities in the Area,
Document ISBA/17/A/9, 25 July 2011.}

In addition to these specific environmental commitments, activities of the Authority,
sponsoring states and contractors should also be guided by the so-called precautionary
approach.\footnote{Crusts Regulations, Reg. 33(2) and (5); Sulphides Regulations, Reg. 33(2) and (5). Such a provision was not
initially included in the Nodules Regulations, but it has since been added by way of amendments adopted in
2013; Nodules Regulations, Reg. 31(2) and (5).} As noted by the Seabed Disputes Chamber, ‘[t]he provisions of the (...) Regulations transform [the] non-binding statement of the precautionary approach in the Rio
Declaration into a binding obligation. The Seabed Disputes Chamber gives a useful definition of when the precautionary approach applies, stating that ‘[i]t is the obligation applies in situations where scientific evidence concerning the scope and potential negative impact of the activity in question is insufficient but where there are plausible indications of potential risks.’ The problem is that this statement applies to most activities in the Area, given our limited understanding of the deep seabed environment. Moreover, it is not entirely clear what are the consequences of the precautionary approach in this context. The regulatory regime would appear to fall short of prohibiting the carrying out of activities until it can be proven that there is no harm to the marine environment. The precautionary approach would, however, seem to reinforce the need to continuously monitor seabed activities and to keep the regulatory regime under periodic review. Moreover, the precautionary approach may be used as a justification for protective measures, even in the absence of scientific evidence. For example, the Environmental Management Plan for the Clarion-Clipperton Fracture Zone is explicitly based upon the precautionary approach. In that case, there was no evidence of environmental harm to the proposed protection areas, but instead it was formulated on the basis of more general concerns for the protection of the marine environment and the designation of a representative network of protected areas. Thus, it provides a practical example of the Authority being willing to take a precautionary approach to the regulation of seabed mining.

5. Conclusion

This chapter has sketched out the complex international regime that has been put into place to regulate mining for the resources located in the International Seabed Area. This regime is based upon the 1982 United Nations Convention on the Law of the Sea, as modified by the

---

239 Seabed Disputes Chamber of the International Tribunal of the Law of the Sea (n121) para. 127. They go on to say, at para. 131, that ‘Having established that under the Nodules Regulations and the Sulphides Regulations, both sponsoring States and the Authority are under an obligation to apply the precautionary approach in respect of activities in the Area, it is appropriate to point out that the precautionary approach is also an integral part of the general obligation of due diligence of sponsoring States, which is applicable even outside the scope of the Regulations.’

240 Seabed Disputes Chamber of the International Tribunal of the Law of the Sea (n121) para. 131.

241 See Birnie, Boyle and Redgwell (n232) 159: ‘This reversal of the burden of proof is exceptional.’

242 Crusts Regulations, Reg. 33(1).

243 Decision of the Council relating to an environmental management plan for the Clarion-Clipperton Zone, Document ISBA/18/C/22, 26 July 2012, para. 2.

244 Greenpeace criticizes the Areas of Particular Environmental Interest in the Clarion-Clipperton Fracture Zone because ‘the protected areas were designed around the proposed mining sites, in part to protect the interests of mining claim holders, therefore inevitably compromising conservation goals’; Greenpeace (n193) 11. However, what Greenpeace does not acknowledge is that the Authority does have the power to demand the designation of Preservation Reference Zones within mining areas; see above.
1994 Part XI Implementing Agreement. However, it is also clear that this is an evolutionary regime and the International Seabed Authority has played a major role in developing regulations for deep seabed mining in order to achieve the objective of sustainable development. These regulations balance the objective of the Authority to promote economic development of seabed resources with the need to protect the deep seabed environment.

The major challenge that remains is how to achieve this balance in designing a regime for the exploitation of marine minerals. This phase of activity clearly has the potential to be the most destructive. It is therefore vitally important that the balance between economic development and environmental protection is carefully thought through in the initial elaboration of a regime for exploitation of marine minerals in the International Seabed Area.

To add to this challenge, our understanding of the oceans, particularly the deep seas, is only developing slowly and therefore it may be necessary to introduce revisions into the regime at a later stage. To this end, the Authority should consider legal mechanisms to ensure that contracts can be modified whilst also providing protections for investors to guard against a fundamental change in the equilibrium of the contractual terms. In this respect, lessons may be learned from other investment sectors. After all, the Authority can only achieve a truly precautionary approach to deep seabed mining if it is able to respond in an effective manner to new developments in science and technology.

Another challenge for the Authority is to ensure an ecosystems approach to the protection of the marine environment. Clearly other activities, aside from mining, can affect deep seabed ecosystems and it is therefore necessary to adopt an approach that can consider the cumulative impacts on the marine environment. As the Authority is only competent to regulate activities in the Area, such an approach will necessitate cooperation with other relevant international organizations. This is an emerging issue on the international agenda and one that merits the attention of the international community as it seeks to make progress towards a truly sustainable approach to oceans management.

---


246 J. A. Ardron et al, ‘The Sustainable Use and Conservation of Biodiversity in ABNJ: What can be achieved using existing international agreements?’ (2014) 49 Marine Policy 98, 103-106. See also Collective arrangement between competent international organizations on cooperation and coordination regarding selected areas in areas beyond national jurisdiction in the North-East Atlantic, Document ISBA/20/C/15, 1 July 2014. No decision was taken on the proposal but ‘the secretariat of the Authority was requested to enter into discussions with the secretariat of the OSPAR Commission, with a view to reporting back to the Council on the matter in 2015’; Summary Report on the work of the Council during the twentieth session, Document ISBA/20/C/32, 23 July 2014, para. 27.

247 It is one of the issues being discussed by the UN Ad Hoc Opened-Ended Informal Working Group on Sustainable Development in Areas Beyond National Jurisdiction; see E. Druel and K.M. Gjerde, ‘Sustaining