BIG DECISIONS IN UNCERTAIN DEPTHS:

ADAPTIVE RISK MANAGEMENT OF DEEP SEABED MINING IN INTERNATIONAL WATERS

Jesse Aimer

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Introduction

The deep seabed has been described as the next frontier in resource extraction.[1] Proclaimed as the new "global goldrush",[2] deep seabed mining involves the mining of mineral deposits at the seabed for use in gadgets, electric cars and clean energy, amongst other sectors.[3] The International Seabed Authority (ISA) has granted 29 contracts to organisations to explore the seabed for minerals in the seabed beyond national jurisdiction (the Area). The ISA is currently in the process of drafting regulations which allow these minerals to be "exploited", or in common parlance, mined.[4] However, there is significant uncertainty over the likely impacts mining will have on the fragile and slow-recovering ecosystems of the deep-sea.[5]

To manage the risk and uncertainty inherent in deep seabed mining, the ISA intends to incorporate the precautionary principle and adaptive management into the future exploitation regime.[6] Adaptive management has been recognised as enabling the application of a precautionary approach to managing risk whilst allowing for an development to proceed.[7] Adaptive management is considered to be well-suited to managing the effects of activities in systems which are complex and subject to change.[8]

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[1] Julie Hunter, Pradeep Singh and Julian Aguon "Broadening Common Heritage: Addressing Gaps in the Deep Sea Mining Regulatory Regime" (16 April 2018) Harvard Environmental Law Review <http://harvardelr.com/2018/04/16/broadening-common-heritage/>.

[2] Brian Clark Howard "The Ocean Could Be the New Gold Rush" (14 July 2016) National Geographic <https://www.nationalgeographic.com.au/nature/the-ocean-could-be-the-new-gold-rush.aspx>

[3] Kathryn Miller and others "An Overview of Seabed Mining Including the Current State of Development, Environmental Impacts, and Knowledge Gaps" (2018) 4(418) Front Mar Sci 1 at 5.

[4] See Draft Regulations on Exploitation of Mineral Resources in the Area ISBA/24/LTC/WP.1/Rev.1. (9 July 2018). (Draft Exploitation Regulations).

[5] LM Wedding and others "Managing mining of the deep seabed" (2015) 349(6244) Sci 144 at 144.

[6] Draft Exploitation Regulations, draft reg 2(b); Annex VII, s 2(g).

[7] JB Ruhl "Regulation by Adaptive Management-Is It Possible?" (2005) 7 Minn J L SCI & TECH 21. See also the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (NZ), s 61(3), which states "if favouring caution and environmental protection means that an activity is likely to be

Adaptive management is primarily a procedural tool.[9] It operates as an iterative decision-making process which allows management practices to adjust to new information concerning the effects of the activity on the environment.[10] To be an effective tool for managing the effects of mining activities, adaptive management will need to be properly integrated into the ISA's decision-making framework.[11]

However, the management flexibility adaptive management requires creates a tension with the investment certainty desired by the resource user. Such tension has been recognised by the ISA, who have noted the need to develop:[12]

> a regulatory framework that provides certainty, predictability and stability for the contractor base and other stakeholders, while at the same time providing flexibility and adaptability to adjust the framework as the industry develops and new knowledge becomes available.

How an adaptive management approach should balance flexibility with certainty is to a large extent shaped by the factual and regulatory context adaptive management is intended to operate under. The important role of the ISA to ensure activities in the Area are carried out for the benefit of humankind as a whole is an essential component of the

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refused, the marine consent authority must first consider whether taking an adaptive management approach would allow the approach to be undertaken."

[8] CS Holling *Adaptive Environmental Assessment and Management* (John Wiley & Sons, Chichester, U.K., 1978) at 25-37.

[9] Aline Jaeckal "Deep Seabed Mining and Adaptive Management: The Procedural Challenges for the International Seabed Authority" (2016) 70 Mar Policy 205 at 205.

[10] Robin Craig and JB Ruhl "Designing Administrative Law for Adaptive Management" (2014) 67 Vand L Rev 1 at 1.

[11] Jaeckal, above n 9

[12] Legal and Technical Commission *Draft regulations on exploitation of mineral resources in the Area: Note by the Legal and Technical Commission*, (International Seabed Authority, ISBA/24/C/20, 10 July 2018), para 22.

mining regime in the Area. It will be argued the nature of the ISA entitles it to have the flexibility under the exploitation contract to require adjustments be made to mining operations to prevent serious harm to the marine environment. This administrative flexibility can be legitimised through the creation of a structured process by which risk management decisions under an adaptive management approach can be made.

The purpose of this dissertation is to consider how the procedures required for adaptive management should be incorporated into future exploitation contract. The first Chapter sets out the regulatory context of deep seabed mining in the Area beyond national jurisdiction. Understanding the regulatory context is important, as it provides the guidance as to how administrative flexibility and certainty should be balanced under an adaptive management approach. It will also outline the ISA's decision-making processes, which adaptive management will need to be incorporated into to be effective.

The second Chapter outlines how the law can craft a response to the risk and uncertainty posed by deep seabed mining. It begins by briefly considering the elements of the precautionary principle, before narrowing to closely analyse one "precautionary remedy" of adaptive management. It concludes a feedback mechanism which allows for management practice to be adjusted in response to new knowledge is the key to adaptive management's successful deployment.

The third chapter explores the ideology underlying the regulatory context of deep seabed. The Chapter aims to consider how the exploitation contracts can incorporate an adaptive management approach which provides the ISA with sufficient administrative flexibility while also providing the appropriate level of certainty to the mining operator. It argues that the ISA has an important regulatory role in the management of mining activities in the Area beyond national jurisdiction. It concludes that the exploitation contract should be treated as being governed under public law principles, with the appropriate balance between certainty and flexibility being provided through the creation of a structured decision-making process incorporated into the contract. The final chapter concludes by considering how such a decision-making process can operate in practice to

ensure a balance between the interests of the ISA, the contractor and humankind as a whole. The question of which party is responsible for making the decision under AM, and the process by which the decision is made, can significantly impact the outcome of the substantive decision. Therefore, the importance of a well-thought and structured decision-making process under an AM approach cannot be underestimated by the ISA.

I An Overview of Deep Seabed Mining in International Waters

A Deep Seabed Mining in the Area

The International Seabed Authority (ISA) currently regulates the exploration of three groups of minerals: polymetallic nodules, polymetallic sulphides and cobalt-rich crusts.[13] Polymetallic nodules are found in soft sediment at the bottom of the ocean, with polymetallic sulphides found near hydrothermal vents.[14] The mining of these minerals is likely to result in a plume of suspended sediment which will destroy the surface where organisms live, bury organisms under sediment and change the chemical composition of the surrounding water.[15] Mining the seabed near hydrothermal vents poses a particular risk that rare species, some of which remain unknown, could be lost.[16]

Cobalt-rich crusts are found mainly on the summits of seamounts and the outer rim of ocean terraces.[17] These minerals are technically difficult to mine, as they must be separated from the substrate rock to prevent the mineral from diluting.[18] Research has demonstrated there may be little recovery of mined locations, even years after mining has concluded.[19]

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[13] Jan Markussen "Deep Seabed Mining and the Environment: Consequences, Perceptions and Regulations" in HO Bergensen and G Parmann (eds), *Green Globe Yearbook of International Cooperation on Environment and Development* (Earthscan Publications Ltd, London, 1994) 31 at 31-32.

[14]Miller and others, above n 3, at 2.

[15]Markussen, above n 13, at 33.

[16]Miller and others, above n 3, at 3.

[17]At 4.

[18]At 4.

[19] Cindy Lee Van Dover "Impacts of Anthropogenic Disturbances at Deep-Sea Hydrothermal Vent Ecosystems: A Review" (2014) 102 Marine Envtl Res 59 at 65–66; J Halfar and RM Fujita "Danger of Deep-sea Mining" (2007) 316 Sci 987 at 987; Katia Moskvitch "Health Check for Deep Sea Mining: European Project Evaluates Risks to Delicate Ecosystems" (2014) 512 Nature 122 at 123; H Bluhm "Re-establishment of an Abyssal Megabenthic Community After Experimental Physical Disturbance of the Seafloor" (2001) 48 Deep-Sea Res II 3841 at 3841; C Borowski "Physically Disturbed Deep-sea Macrofauna in the Peru Basin, Southeast Pacific, Revisited 7 Years After the Experimental Impact" (2001) 48 Deep-Sea Res II 3809 at 3819–20, 3828–29; and Dmitry Miljutin and others "Deep-Sea Nematode

There is significant uncertainty concerning the potential impacts of deep seabed mining. Large amounts of microbial taxa remain completely unknown to science, making it impossible to predict how mining the seabed will impact these species.[20] Added to this uncertainty is the enhanced risk of deep-sea ecosystems being pushed beyond their adaptive capacity as deep-sea ecological processes typically operate on longer timescales than ecological processes on land or shallow water.[21] The cumulative effects of multiple mining operations and other stressors such as climate change on marine life could further reduce ecosystem resilience and increase the risk of environmental collapse.[22] The potential mining has to cause unexpected and irreversible environmental harm to the deep seabed emphasises the importance of adopting regulations which encourage caution and can adapt with new knowledge.

B The United Nations Convention on the Law of the Sea

1 Background

The deep seabed is governed by the United Nations Convention on the Law of the Sea (UNCLOS/ Convention).[23] The Convention is made up of 320 articles, split into 17 Parts or Chapters, with nine additional annexes.[24] The regime governing the deep seabed is contained in Part XI of the Convention.[25] Concerns by many western countries over

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Assemblage Has Not Recovered 26 Years After Experimental Mining of Polymetallic Nodules (Clarion-Clipperton Fracture Zone, Tropical Eastern Pacific)" (2011) 58 Deep Sea Res I 885 at 886.

[20] Cinzia Corinaldesi "New Perspectives in Benthic Deep-sea Microbial Ecology" (2015) 2 Front Mar Sci 1 at 1.

[21] See Miller and others, above n 3, at 2.

[22] JI Ellis and others "Environmental management frameworks for offshore mining: the New Zealand approach" (2017) 84 Mar Policy 178 at 181.

[23] United Nations Convention on the Law of the Sea 1833 UNTS3 (opened for signature 10 December 1982, entered into force 16 November 1994). (UNCLOS).

[24] Donald Rothwell and Tim Stephens *The International Law of the Sea* (2nd ed, Portland, 2016) at 15.

[25] At 15.

elements of the deep seabed regime[26] led Part XI being adjusted through the 1994 Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982 (1994 Agreement).[27] The 1994 Agreement and Part XI of the Convention are to be "interpreted and applied together as a single instrument", with the 1994 Agreement taking precedence in the event of an inconsistency.[28]

The Convention refers to the deep seabed as the "Area", which is defined as "the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction".[29] The limits of national jurisdiction are either 200 nautical miles from the territorial sea baselines, or further beyond this distance to the outer limits of the continental shelf established by States in line with Article 76 of the Convention.[30]

2 Part XI of the Convention

The deep seabed regime is governed under the common heritage of humankind (CHM) principle.[31] The main elements of the CHM principle in the deep seabed context are:[32]

(1) The non-appropriation of seabed areas and seabed resources by states or private entities;
(2) A system of international management of deep seabed mining through the ISA, which was established by the Convention;
(3) The sharing of benefits from deep seabed mining for the common good of humanity; and

[26] The main concern regarded the nature and powers of the International Seabed Authority: see Rothwell and Stephens, above n 24, at 137. For a discussion on the changes made by the 1994 Agreement, see ED Brown "The 1994 Agreement on the Implementation of Part XI of the UN Convention on the Law of the Sea: Breakthrough to Universality?" (1995) 19 Mar Pol 5.

[27] *Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982* GA Res A/48/263 (1994). (1994 Agreement).

[28] Art 2(1).

[29] UNCLOS, art 1(1).

[30] Rothwell and Stephens, above n 24, at 130.

[31] See UNCLOS, arts 136, 137(2) and 140.

[32] Rothwell and Stephens, above n 24, at 127. See generally Christopher Joyner "Legal Implications of the Concept of the Common Heritage of Mankind" (1986) 35 ICLQ 190 at 191-195.

(4) The peaceful use of deep seabed areas.

The characterisation of the Area and its resources as the CHM influences all aspects of the deep seabed mining regime and creates a difference between the water column and the seabed in the Area in the eyes of the law.[33]

Part XI gives the ISA the responsibility of putting the deep-sea mining regime into effect.[34] The ISA organises and controls activities in the Area, with an emphasis placed on administering the Area's resources.[35] The ISA's jurisdiction is limited to the mineral resources at the seabed,[36] meaning it does not have control over other activities which impact the seabed.[37] However, its jurisdiction is not spatially restricted, with the ISA having the responsibility of protecting the water column, coastal areas and other marine life, in addition to the seabed, when facilitating the mining regime.[38]

C The Structure of the International Seabed Authority

The ISA has a tripartite constitutional structure, with the principal organs being the Assembly,[39] the Council and the Secretariat.[40] As seabed mining activities are developed, the functions of each organ of the ISA will develop alongside, based on an 'evolutionary

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[33] Aline Jaeckal *The International Seabed Authority and the Precautionary Principle: Balancing Deep Seabed Mineral Mining and Marine Environmental Protection* (BRILL, Leiden, 2017) at 74. The water column has been termed the "High Seas" and is primarily governed under Part VII of UNCLOS. For further information, see Rothwell and Stephens, above n 24.

[34] Rothwell and Stephens, above n 24, at 141.

[35] UNCLOS, art 157(1).

[36] UNCLOS, art 133; Defined as all solid, liquid or gaseous mineral resources in or beneath the seabed, including polymetallic nodules.

[37] Such activities could include deep sea trawling, the laying of pipelines and submarine cables, military activities or conducting marine scientific research: see Rothwell and Stephens, above n 24, at 143.

[38] UNCLOS, art 145; Jaeckal, above n 33, at 125

[39] See UNCLOS, arts 159, 160 (see appendix).

[40] Rothwell and Stephens, above n 17, at 143.

approach'.[41] The Council, Secretariat and the Legal and Technical Commission (LTC), a subsidiary body of the Council, are the main bodies involved in granting and administering contracts to prospect, explore and exploit the resources of the deep seabed. The next section will briefly outline the operation of these organs.

1 The Council

The Council is the executive arm of the ISA[42] and is its main decision-making organ.[43] Its main responsibilities are supervising and coordinating the implementation of the deep seabed mining regime,[44] and approving Plans of Work for exploration or exploitation after they have been reviewed by the LTC.[45] The Council is made up of 36 members who are elected by the Assembly.[46] The make-up of the Council is set by a formula to ensure adequate representation of several groups of states, including major consumers of minerals, major investors in deep-sea mining, developing countries and countries with "special interests"[47].[48] In addition, there must be an "overall equitable geographical division of seats at the Council as a whole".[49]

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[41] 1994 Agreement, annex, s 1(3); Rüdiger Wolfrum "Legitimacy of International Law and the Exercise of Administrative Functions: The Example of the International Seabed Authority, the International Maritime Organization (IMO) and International Fisheries Organizations" (2008) 9(11) Ger Law J 2039 at 2046.

[42] UNCLOS, art 161(1). (See Appendix).

[43] Jaeckal, above n 26, at 93.

[44] UNCLOS, art 162(2)(a).

[45] UNCLOS, art 162(2)(j). The process for approving Plans of Work for exploration and exploitation is discussed below at Ch I, s D(2).

[46] UNCLOS, art 161(1).

[47] Such as "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": 1994 Agreement, Annex, s 3(15)(d).

[48] 1994 Agreement, annex, s 3(15); UNCLOS, art 161(1).

[49] 1994 Agreement, annex, s 3(15)(e).

2 The Legal and Technical Commission

Although a subsidiary body of the Council, the LTC has a central role in developing and implementing the deep seabed mining regime.[50] It is made up of 24 members, appointed by the Council, who have expertise in fields relevant to deep seabed mining, such as geology, marine science, economics and law.[51] The LTC specialises in dealing with scientific and other technical issues,[52] with the Council subsequently adopting decisions based on the LTC's recommendations.[53] The existence of the LTC is significant as it creates a central role for scientific information in the decision-making process. In doing so, it ensures decisions are based on scientific advice, which is in line with the precautionary approach.[54]

3 The Secretariat

The Secretariat consists of a Secretary-General and the staff required to fulfil the administrative functions of the ISA.[55] The Secretary-General functions as the ISA's chief administrative officer[56] and is elected by the Assembly for a term of four years.[57] The staff of the Secretariat consist of qualified scientific, technical and other personnel required to fulfil the administrative functions of the ISA.[58] Article 169 provides for the Secretary-General to make suitable arrangements[59] for consultation and co-operation with international and non-governmental organisations.[60] This enables these organisations to

[50] Jaeckal, above n 33, at 96.

[51] UNCLOS, art 165(1). (See Appendix).

[52] Rothwell and Stephens, above n 24, at 144.

[53] Jaeckal, above n 33, at 96.

[54] Aline Jaeckal *The Implementation of the Precautionary Approach by the International Seabed Authority: Discussion Paper No 5* (International Seabed Authority, March 2017) at 8.

[55] UNCLOS, art 166(1); Satya Nandan, Michael Lodge and Shabtai Rosenne (ed), *The United Nations Convention on the Law of the Sea 1982: A Commentary*, *Vol VI* (The Hague, Martinus Nijhoff, 2002) at [166.1].

[56] UNCLOS, art 166(3).

[57] UNCLOS, art 166(2).

[58] UNCLOS, art 167(1).

[59] With the Council's approval.

[60] UNCLOS, art 169(1).

send members to observe meetings of the different organs of the ISA,[61] with procedures for obtaining the views of such organisations also being established in appropriate cases.[62]

D The Mining Code

1 A Brief Overview

The Mining Code is made up of "Regulations" and "Recommendations" adopted by the ISA. The Mining Code, along with the Convention and 1994 Agreement, provides the framework for mining activities in the Area.[63] The Mining Code presently is made up of three sets of Regulations. These are the Regulations on Prospecting and Exploration of Nodules,[64] the Regulations on Prospecting and Exploration for Sulphides[65] and the Regulations on Prospecting and Exploration on Crusts.[66] In addition, there are several Recommendations, including the Recommendations to Guide Contractors on Assessing Environmental Impacts of Exploring Minerals.[67] The ISA is currently drafting regulations which will allow for the exploitation of the three types of seabed minerals.[68] The first

[61] Although the ability to attend meetings is dependent on the rules of procedures of the particular organ.

[62] UNCLOS, art 169(2).

[63] UNCLOS, art 153; Rothwell and Stephens, above n 24, at 148.

[64] Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area, ISBA/6/A/18 (13 July 2000), amended by ISBA/19/C/17 (22 July 2013) (Nodules Regulations).

[65] Regulations on Prospecting and Exploration for Polymetallic Sulphides in the Area ISBA/16/A/12/Rev.1 (15 November 2010), amended by ISBA/19/A/12 (25 July 2013) and ISBA/20/A/10 (24 July 2014) (Sulphide Regulations).

[66] Regulations on Prospecting and Exploration for Cobalt-rich Ferromanganese Crusts in the Area ISBA/18/A/11 (27 July 2012), amended by ISBA/19/A/12 (25 July 2013) (Crusts Regulations).

[67] Recommendations to Guide Contractors on Assessing Environmental Impacts of Exploring Minerals ISBA/19/LTC/8 (1 March 2013).

[68] Rothwell and Stephens, above n 24, at 150.

working draft of the exploitation regulations was released in July 2016,[69] with the most recent working draft being released in July 2018.[70]

The Mining Code characterises the mining operations as consisting of three stages: prospecting, exploration and exploitation. Prospecting is defined as "the search for deposits of polymetallic nodules in the Area…without any exclusive rights."[71] Exploration involves "searching for deposits of polymetallic nodules in the Area with exclusive rights" and includes "studies of the technical, economic, commercial and other appropriate factors that must be taken into account in exploitation."[72] Finally, exploitation means "the recovery for commercial purposes of polymetallic nodules in the Area and the extraction of minerals therefrom".[73] It is expected the most serious environmental impacts will occur during the exploitation phase because this is where large-scale extraction of the seabed will take place.[74]

Mining operations can be carried out by "States Parties",[75] state enterprises, or legal persons which possess the nationality, or are controlled by, States Parties.[76] In order to be able to explore or exploit the resources on the seabed, a mining operator (contractor) must obtain a contract from ISA which grants them exclusive, but temporary rights to explore

[69] Legal and Technical Commission *Working Draft Regulations and Standard Contract Terms on Exploitation for Mineral Resources in the Area* (International Seabed Authority, February 2016).

[70] Draft Regulations on Exploitation of Mineral Resources in the Area ISBA/24/LTC/WP.1/Rev.1. (9 July 2018). (Draft Exploitation Regulations).

[71] Nodules Regulations, reg 1(3)(e).

[72] Nodules Regulations, reg 1(3)(b).

[73] Nodules Regulations, reg 1(3)(a)

[74] See Jaeckal, above n 33, at 154.

[75] See UNCLOS, art 1(2)(1), where "States Parties" is defined as meaning "States which have consented to be bound by this Convention and for which this Convention is in force":

[76] UNCLOS, art 153(2)(b) (se Appendix).

and/or exploit minerals in a certain area.[77] The ISA also has the ability to mine through an organ termed the "Enterprise", [78] although the Enterprise has yet to be set up.[79]

2 Procedure for Assessing Mining Applications in the Area

The process of becoming a contractor begins with an application to the ISA with a Plan of Work to explore or exploit a specific mineral deposit.[80] Under the proposed exploitation regulations,[81] the Secretary-General will receive and review the application,[82] before making the Environmental Impact Statement, Environmental Management and Monitoring Plan (EMMP) and the Closure Plan available to the public, with Stakeholders and members of the ISA invited to submit written comments.[83] The draft regulations then propose for the Plan of Work to be considered by the LTC. The LTC will consider a number of factors in deciding whether to approve the Plan, including the Plan's:[84]

(1) compliance with the Convention;
(2) benefit to humankind;
(3) economic and technical viability;
(4) the financial and technical competence of the contractor; and
(5) impact on the marine environment, including other uses of the marine environment and the application of the precautionary approach.

[77] UNCLOS, annex III arts 3, 16.

[78] UNCLOS, art 170.

[79] M Bourell, T Thiele and D Currie "The Common Heritage of Mankind as a means to assess and advance equity in deep sea mining" (2016) 95 Mar Policy 311 at 313.

[80] Jaeckal, above n 9, at 206.

[81] Draft Exploitation Regulations.

[82] Draft reg 10(1).

[83] Draft reg 11(1)(a).

[84] See draft regs 13 and 14.

If the LTC is satisfied the criteria has been met, it will recommend the Council approve the Plan of Work. The Council is then required to approve the application, unless a two-thirds majority do not approve the application, including half the members of each special interest chamber.[85] After the Council has approved the Plan of Work, it is prepared in the form of a contract between the ISA and the applicant.[86] It is proposed the maximum initial term for the exploitation contracts will be 30 years,[87] with further renewal periods of 10 years available.[88]

3 Dispute Resolution under the Convention

The Seabed Disputes Chamber ("Chamber") has compulsory jurisdiction over disputes arising from activities in the Area.[89] The Chamber has the ability to apply the Convention, as well as the rules, regulations and procedures adopted by the ISA, the mining contracts and other rules of international law to its decisions.[90] The Chamber has jurisdiction over disputes between ISA and a contractor on reasons why a contract was refused, or on the terms upon which it was granted.[91] However, there is a presumption that disputes concerning the interpretation and application of a contract once it has been granted will be heard in commercial arbitration unless the parties agree otherwise.[92]

Article 189 contains some important limitations to the Chamber's jurisdiction. The Chamber cannot "substitute its discretion for that of the Authority". It also does not possess the ability to determine the legality of the rules, regulations and procedures

[85] 1994 Agreement, s 3(11)(a).

[86] Roswell and Stephens, above n 24, at 152.

[87] Draft Exploitation Regulations, draft reg 21(1).

[88] Draft reg 21(4).

[89] UNCLOS, art 187.

[90] UNCLOS, art 293, annex VI art 38.

[91] UNCLOS, art 187(d).

[92] UNCLOS, art 188(2)(a). It is likely, the procedure contained in the United Nations Commission on International Trade Law ("UNCITRAL") Arbitration Rules would be used: see Nandan, Lodge and Rosenne, above n 55, at [188.10].

created by the ISA.[93] There are, however, three important exceptions.[94] Firstly, the Chamber can decide "claims that the application of any rules, regulations and procedures of the Authority in individual cases would be in conflict with the contractual obligations of the parties to the dispute or their obligations under this Convention." Secondly, the Chamber can decide "claims for damages to be paid or other remedy to be given to the party concerned for the failure of the other party to comply with its contractual obligations or its obligations under this Convention." A third, more traditional, category incorporates claims concerning "excess of jurisdiction or misuse of power".[95] The dispute resolution provisions demonstrate an attempt to find a balance between the protection of the ISA's decision-making authority and the rights of parties engaging in seabed mining.[96]

4 Environmental Protection under the Mining Code

Article 145 of the Convention incorporates a strong environmental tone into the Convention, requiring necessary measures be taken "with respect of seabed mining activities in order to provide effective protection of the marine environment from harmful effects which may arise from such activities".[97] Before mining operations are underway, the ISA can prevent serious harm to the marine environment either by setting aside areas where mining is not allowed or denying an applicant a contract to conduct mining activities on the seabed.[98] Once mining operations are underway, the ISA can issue Emergency Orders requiring a contractor suspend or alter their operations,[99] which underscores the power of the ISA's role under the Convention. If environmental harm does occur, the ISA can hold the contractor and sponsoring state liable.[100]

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[93] UNCLOS, art 189.

[94] See Nandan, Lodge and Rosenne, above n 55, at [189.10(c)].

[95] UNCLOS, art 187(b)(ii).

[96] Nandan, Lodge and Rosenne, above n 55, at [189.1].

[97] UNCLOS, art 45 (see Appendix). Rothwell and Stephens, above n 24, at 153.

[98] Lisa Levin and others "Defining "serious harm" to the marine environment in the context of deep-seabed mining" (2016) 74 Mar Pol 245 at 250.

[99] UNCLOS, arts 162(2)(w) and 165(2)(k).

[100] Levin and others, above n 98, at 246.

One of the fundamental principles[101] proposed in the draft exploitation regulations is for the ISA to:[102]

> provide for the effective protection of the Marine Environment from the harmful effects that may arise from Exploitation…based on the following principles:
>
> (a) the protection and conservation of the Marine Environment, including biological diversity and ecological integrity;[103]
> (b) The application of the precautionary approach, as reflected in principle 15 of the Rio Declaration on Environment and Development;[104]
> (c) The application of an ecosystem approach;[105] and
> (d) Access to data and information relating to the protection and preservation of the Marine Environment, accountability and transparency and encouragement of effective public participation.[106]

When introducing the National Environmental Policy Act 1969 (US), Senator Jackson said, "A statement of environmental policy is more than a statement of what we believe as a people… It establishes priorities and gives expression to our national goals and aspirations…"[107] The strong environmental principles contained in the Convention and draft exploitation regulations suggest the importance of protecting the marine environment should lie at the core of the development of the exploitation regime.

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[101] See Draft Exploitation Regulations, draft reg 2. Draft reg 2(8) proposes that decision-makers under the regulations "Ensure that these Regulations shall be interpreted compatibly with these fundamental principles, and that all the functions performed under these Regulations shall be undertaken in conformity with these fundamental principles."

[102] Draft reg 2(5).

[103] Draft reg 2(5)(a).

[104] Draft reg 2(5)(b).

[105] Draft reg 2(5)(c).

[106] Draft reg 2(5)(d).

[107] 115 Cong Rec 40416 (1969), as cited in *TV 3 Network Services Ltd v Waikato District Council* [1998] 1 NZLR 360 at 6.

On the other hand, it is important to recognise the competing goals contained in the exploitation regime. In addition to ensuring the effective protection the marine environment, the draft regulations also contain principles concerned with:

(1) encouraging the development of seabed mining;[108]
(2) the sharing of benefits from seabed mining;[109]
(3) fostering a healthy development of the world economy;[110] and
(4) ensuring the resources are exploited in accordance with sound commercial principles.[111]

The Council has recognised the different goals of the exploitation regime, recently emphasising its aim to ensure the regulations are viable from both an environmental and commercial perspective.[112] In reality, it is almost inevitable there will be times during the implementation of the exploitation regime that the developmental-focussed and environmentally-focussed principles will come into conflict.[113] When conflict does occur, decision-makers are often required to favour one value over another.[114]

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[108] Draft reg 2(b).

[109] Draft reg 2.

[110] Draft reg 2.

[111] Draft reg 2(d).

[112] Council, *Statement by the President of the Council on the work of the Council during the first part of the twenty-fourth session* (International Seabed Authority, ISBA/24/C/8, 13 March 2018), paras 22(f), (g).

[113] For a comparable argument made in the context of New Zealand's Resource Management Act 1991, see JG Fogarty "Giving Effect to Values used in Statutes" in Jeremy Finn and Stephen Todd (eds) *Law, Liberty and Legislation: Essays in Honour of John Burrows QC* (LexisNexis, New Zealand, 2008) at 11. The Resource Management Act (NZ) aims to achieve the "sustainable management of natural resources", which incorporates environmental, social, economic and cultural goals: see the Resource Management Act 1991, s 5.

[114] See, e.g. AC Warnock "Regulating the Environmental Effects of Oil and Gas Activities in the Exclusive Economic Zone and Extended Continental Shelf" (2011) 9(7) Resource Management Bulletin 76 at 77.

Adaptive management can offer added value to decision-makers who are required to give effect to competing policy objectives. Ruhl argues adaptive management can offer decision-makers a "middle route" by allowing development to occur, but subject to conditions which encourage learning and allows the original decision to be re-evaluated in light of new knowledge.[115] In short, adaptive management can offer decision-makers a compromise which does not allow one policy goal to dominate the others.[116] Therefore, adaptive management can offer a mechanism to better enable the ISA to give effect to the competing goals contained in the Mining Code. The following Chapters will analyse how adaptive management can be operationalised in the unique factual and regulatory context posed by deep seabed mining in the Area.

[115] See JB Ruhl "A Manifesto for the Radical Middle" (2002) 38 Idaho L Rev 385. See also Catherine Iorns and Thomas Stuart "Murky waters: adaptive management, uncertainty, and seabed mining in the Exclusive Economic Zone" (2017) 13(2) Policy Quarterly 10 at 15.

[116] Ruhl, above n 115, at 405.

II Managing Risk and Uncertainty in Deep Seabed Mining

One of the greatest regulatory challenges the ISA is likely to face under the exploitation phase of DSM is managing the uncertain environmental effects of DSM activities.[117] Law has crafted principles and approaches to deal with uncertainty. Foremost amongst these approaches are the precautionary principle and adaptive management. Before these principles are analysed in greater detail, the next section will briefly consider the concept of uncertainty as it is a core issue the exploitation regulations will be required to deal with.

A Defining Risk and Uncertainty

There are different types of uncertainty,[118] each of which requires a different regulatory response. The first type of uncertainty is what Wynne terms "risk". A "risk" can be said to exist when scientists have a general understanding of the environmental system in question and can quantify the chance of different outcomes occurring.[119]

If the important system parameters are known, and scientists can predict the type of harm likely to occur, but the probability of the harm occurring is not known, then Wynne argues we talk in terms of "uncertainties". Science has developed methods for estimating uncertainties and their impact on outcomes, enabling uncertainties to be considered in the decision-making analysis.[120]

However, Wynne's third type of uncertainty, "ignorance", presents a much greater challenge for decision-makers. Wynne defines ignorance as "knowledge which escapes

[117] See Chapter I.

[118] See Brian Wynne "Uncertainty and Environmental Learning: Reconceiving Science and Policy in the Preventative Paradigm" (1992) 2 Glob Environ Chang 111.

[119] At 114.

[120] At 114.

recognition".[121] In explaining the concept of ignorance, Wynne outlines a situation where scientists attempted to use the behaviour of radioactive material in one soil type to predict its behaviour in another soil type.[122] The radioactive material did not behave as expected due to the material reacting differently to different compounds within the soil. The findings resulted in the models being subsequently adjusted to take into account the new variables which were previously not considered. Such an occurrence often occurs in science, as scientific knowledge gives prominence to a limited number of defined uncertainties, which leaves many uncertainties unconsidered. Therefore, Wynne argues science's limited ability to account for a full range of uncertainties is built into the scientific method.[123] Ignorance poses a risk to decision-makers when social commitments are made based on science as if the scientific method's inbuilt limitations did not exist.[124]

The fourth type of uncertainty Wynne identifies is "indeterminacy". The concept of indeterminacy is based on the fact science can only define a risk, or uncertainty, by artificially "freezing" the surrounding context which may or may not be the same in a real-life situation. Indeterminacy is likely to be particularly relevant to deep seabed mining, where exploitation has yet to be conducted on a large scale.[125]

It is notable that many parameters of the deep-sea ecosystem appear to remain beyond the understanding of marine scientists.[126] Therefore, it is possible mining could result in harm to the marine environment which cannot be predicted or taken into account by decision-makers at the time the initial contract is granted. This emphasises the need for the ISA to craft a response which is cautious in the face of uncertainty and adaptable to respond to

[121] At 114.

[122] See Wynne, above n 118, at 115.

[123] See Wynne, above n 118, at 115. See also TS Kuhn *The Structure of Scientific Revolutions* (University of Chicago Press, Chicago, 1962).

[124] Wynne, above n 118, at 115

[125] See Allen Clark, Jennifer Cook Clark and Sam Pintz, *Towards the development of a regulatory framework for polymetallic nodule exploitation in the area (Technical Study No. 11)* (International Seabed Authority, 26 February 2013) at 20.

[126] See Miller and others, above n 3.

unexpected impacts on the marine environment which were not considered at the time the contract was awarded.

B The Precautionary Principle

The precautionary principle aims to ensure environmental protection by requiring decision-makers be cautious when there is scientific uncertainty concerning the impact of an activity, particularly when there is a complex system involved.[127] The precautionary principle impacts the decision-making process by requiring that uncertainty and a lack of information are biased towards taking precautionary action to prevent environmental harm.[128]A failure to be cautious in the face of a lack of knowledge could lead to "false negatives" where activities assumed to be relatively harmless to the environment in fact damage it.[129]

The precautionary principle has been referenced in both the Nodules Regulations and the Sulphides Regulations.[130] In addition, the ISA has expressed an intention to incorporate the precautionary principle into the exploitation regulations.[131] Therefore, the main concern in this dissertation is not whether the precautionary principle is applicable to the exploitation of the minerals on the deep seabed, but how the principle can be given operational effect.

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[127] JE Hickey and VR Walker "Refining the Precautionary Principle in International Environmental Law" (1995) 14 VJEL 423 at 425; R Somerville "Policy adjudication, adaptive management and the Environment Court" (2013) 9 Resource Management Theory & Practice 13 at 24.

[128] Somerville, above n 127, at 24.

[129] At 24.

[130] Nodules Regulations, reg 31(2); Sulphides Regulations, reg 33(2). See also *Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area, (Advisory Opinion)* [2011] 50 ILM 458, at [127], where the Chamber stated these provisions transformed the precautionary principle from a non-binding obligation to a binding obligation for the sponsoring states.

[131] Draft Exploitation Regulations, draft reg 2(5)(b).

There are numerous descriptions of the elements of the precautionary principle.[132] One such characterisation is that by Trouwborst,[133] adopted by Jaeckal,[134] of the principle having three elements: a threat of environmental harm, uncertainty and action. These elements shape the role required by the decision-maker, who is required to, firstly, determine whether the harm and uncertainty dimensions of the precautionary principle have been met and, if so, determine the appropriate precautionary response.[135] The next sections will briefly outline these three elements of the precautionary principle. The focus will then turn to one precautionary remedy: adaptive management.

1 Threat of Environmental Harm

The decision-maker must first determine how serious the harm to the environment needs to be before a precautionary response is required.[136] There are a couple of different standards present under the Mining Code, with Article 145 requiring protection of the marine environment from "harmful effect[s]",[137] whilst "serious harm" is required before the ISA can enact Emergency Orders[138] or refuse to allow prospecting or exploration activities.[139] In addition, Principle 15 of the Rio Declaration, which has been incorporated in the exploration[140] and draft exploitation,[141] regulations, denotes the threats must be "serious or irreversible".[142] A United Nations Environment Programme has presented examples of "serious or irreversible harm" as incorporating "the extinction of species,

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[132] Jaeckal, above n 33, at 37.

[133] Arie Trouwborst *Precautionary Rights and Duties of States* (Martinus Nijhoff, Leiden, 2006) at 21-35.

[134] Jaeckal, above n 33, at 37-43.

[135] Arie Trouwborst *Evolution and Status of the Precautionary Principle in International Law* (Kluwer Law International, The Hague, 2002) at 7.

[136] Trouwborst, above n 133, at 30.

[137] UNCLOS, art 145.

[138] UNCLOS, art 165(2)(k); Nodules Regulations, reg 33.

[139] UNCLOS, arts 165(2)(l), (w); Nodules Regulations, regs 2, 21(6)(c).

[140] See above.

[141] See Ch 1, s D(4).

[142] United Nations Conference on Environment and Development: Rio Declaration on Environment and Development (1992) 31 ILM 874.

widespread toxic pollution or major threats to essential ecological processes".[143] There is an ongoing discussion among the scientific community, specialists in maritime law and other interested parties to define the threshold of harmful effects what might constitute "acceptable harm" to an ecosystem from seabed mining.[144]

2 Uncertainty

(a) Level of harm required to be demonstrated

If the harm threshold is exceeded, the decision-maker must then determine the level to which that harm must be demonstrated.[145] There is a general requirement there be some reasonable ground for concern.[146] There are various ways in which "reasonable" can be defined. The different precautionary approaches can be conceptualised as operating on a spectrum, from an identifiable risk at one end to a conclusion based on reasonable doubt on the other.[147] However, characterising the role of the decision-maker as making a finding of fact as to the probability of harm occurring may not accurately portray the role of the decision-maker. Rather than making a finding of fact, a phrase more apt to describing past occurrences, the decision-maker is often having to make a prediction about the future effects of an activity.[148] Therefore, in practice, what the decision-maker is doing is making a judgment on whether to accept a risk of harm to the environment exists.[149]

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[143] United Nations Environment Programme *Final Report of the Expert Group Workshop on International Environmental Law Aiming at Sustainable Development* UNEP/IEL/WS/3/2 (1996).

[144] Miller and others, above n 3, at 6-7; See Lisa Levin and others "Defining "serious harm" to the marine environment in the context of deep-seabed mining" (2016) 74 Mar Pol 245.

[145] Alexander Gillespie "Precautionary New Zealand" (2011) 24 NZULR 364 at 372.

[146] At 372.

[147] At 372.

[148] See *Shirley Primary School v Christchurch City Council* [1999] NZRMA 66 (EnvC) at [116], [120]; Ceri Warnock and Maree Baker-Galloway *Focus on Resource Management Law* (LexisNexis, Wellington, 2015) at 19.

[149] *Shirley Primary School v Christchurch City Council*, above n 148, at [117], [120]. See also *Fernandez v Government of Singapore* [1971] 2 All ER 691 (PC) at 691.

The concept of future harm is itself a nuanced concept. New Zealand's Resource Management Act 1991 (RMA), which is New Zealand's primary statute managing the effects of activities on the environment, requires decision-makers take into account both "any effect of high probability"[150] and "any potential effect of low probability which has a high potential impact."[151] This second type of future effect is unlikely to be captured if the decision-maker were required to disregard any possibility of harm if the "odds of it happening are fractionally less than evens."[152]

In determining whether to accept the existence of a risk, the decision-maker will need to consider how it will assess and weigh scientific evidence, including evidence in the form of expert opinions. The New Zealand Environment Court ("NZEnvC") has expertise in weighing and assessing scientific evidence which may be of relevance to the ISA. The NZEnvC is a specialist environment court which, similar to the ISA, has the function of granting permits, termed "resource consents", for activities which may have effects on the environment.[153] In *Shirley Primary School v Christchurch City Council*, the NZEnvC acknowledged evidence relating to the future has a hypothetical element. However, there must be a certain strength of evidence to support any hypothesis made.[154] The Court noted in exceptional cases a very persuasive expert opinion might sufficiently support a hypothesis, as not all potential effects of a activity may have been substantially researched.[155] The Court noted, in such cases, it could be appropriate to trust an expert notwithstanding the lack of statistical evidence. In such cases, the Court held there should be a general acceptance of the methodology used within the scientific discipline involved.[156] Significantly, it was also observed that, in the case of any hypothesis

[150] Resource Management Act 1991 (NZ), s 3(e).

[151] Section 3(f).

[152] *Fernandez v Government of Singapore*, above n 149, at 691.

[153]See Ceri Warnock "Reconceptualising specialist environment courts and tribunals" (2017) 37(3) LS 391 for a more in-depth discussion on the role of specialist environment courts and tribunals.

[154] At [142].

[155] At [151]

[156] At [151].

concerning a high potential impact on the environment, a scintilla of evidence may be all that is needed to the justify the need for rebuttal evidence.[157]

(b) Burden of proof

Under conservative versions of the precautionary principle, there is an assumption an activity will not cause serious harm to the environment. In contrast, under strong versions of the principle, the party wishing to conduct an activity is required to establish the activity will not cause unacceptable environmental harm.[158] In the context of future exploitation contracts, a strong version of the precautionary principle would place the evidential burden on the contractor to demonstrate their mining activities will not cause an unacceptable level of harm to the marine environment. Generally, the Convention operates on the presumption exploitation activities can occur, with exploitation only prohibited in areas where "substantial evidence indicates the risk of serious harm to the marine environment."[159]

3 Action

Once the harm and uncertainty thresholds have been established, the next step for the decision-maker is to decide on the appropriate response.[160] It is generally accepted the precautionary response should be proportionate to the harm accepted.[161] The range of actions available to the decision-maker under the precautionary principle can be perceived as lying on a spectrum.[162] On the "strong" end of the spectrum, the decision-

[157] At [142].

[158] Gillespie, above n 145, at 373.

[159] UNCLOS, art 162(2)(x); Jaeckal, above n 33, at 271.

[160] See, e.g., Aaron Wildavsky "Trial and Error Versus Trial Without Error" in Julian Morris (ed) *Rethinking Risk and the Precautionary* Principle (Butterworth Heinemann, 2000) 22 at 39, where it is stated that once the thresholds of serious harm and probability of the threat have been met, the precautionary principle requires "measures to prevent environmental degradation".

[161] See *Telstra Corporation Ltd v Hornsby Shire Council* [2006] NSWLEC 133 at [128].

[162] See Dale Scott *Application of the Precautionary Principle During Consenting Processes in New Zealand: Addressing Past Errors, Obtaining a Normative Fix and Developing a Structured and Operationalised Approach* (LLM Thesis, Victoria University of Wellington, 2016) at 156, where it is stated

maker could refuse to allow the activity to proceed. In the context of decision-making under the exploitation contracts, a strong precautionary response could take multiple forms. By way of example, the ISA could:

(1) place a moratorium on mining;[163]
(2) prohibit mining in certain geographical locations within the Area;[164] or
(3) refuse to grant a mining contract in an individual circumstance.[165]

Another potential option open to a decision-maker could be to approve an activity subject to an adaptive management approach. Whether adaptive management (henceforth, "AM") can be accurately characterised as a precautionary response is contentious,[166] and arguably fact dependent.[167] Regardless, as will be explored in the following Chapters, it can offer the ISA another tool for managing the uncertain effects of deep seabed mining on the marine environment.

"the particular 'precautionary' actions required by each formulation of the precautionary principle… can vary in strength and specificity."

[163] See UNCLOS, art 145, which states the ISA has the authority to take "necessary measures to ensure effective protection from the marine environment". See Jaeckal, above n 33, at 58.

[164] See Levin and others, above n 98, at 250.

[165] See Chapter I for a discussion on the proposed criteria for the Commission to take into account in deciding whether to approve a Plan of Work and the Environmental Plans.

[166] See Scott, above n 164, at 167, where it is stated that "while adaptive management may form part of a precautionary response, this too in and of itself is not inherently precautionary in nature"; Jaeckal, above n 33, at 59, where it is stated "the relationship between adaptive management and the precautionary principle can be ambiguous". Compare Somerville, above n 127, at 26, where it is stated that "adaptive management has been lauded as a precautionary policy approach to risk management; *Golden Bay Marine Farmers v Tasman District Council* W19/2003, 27 March 2003 at Chapter 5; International Seabed Authority *Discussion on the Development and drafting of Regulations on exploitation for mineral resources in the Area (Environmental matters)* (International Seabed Authority, January 2017) at 7.20; and *New Zealand King Salmon Requests for Plan Changes and Applications for Resource Consent* Blenheim, 22 February 2013 at [179].

[167] See Jaeckal, above n 33, at 58.

C Adaptive Management

One way to address uncertainties inherent in the deep-sea environment, short of prohibiting an activity, is to use environmental management as a science experiment, using the knowledge gained over the course of the activity to influence decision-making. This process, effectively "structured learning by doing",[168] has been termed "adaptive management" and has been described as an pragmatic way of building precaution into a framework regulating uncertain impacts on complex systems.[169] Central to the principle of AM is the concept of making small interventions, which do not result in serious harm, to create further knowledge about the effects of an activity. The knowledge can then be used to re-assess whether the activity should continue, and if so, how it should be managed.[170]

1 Features of Adaptive Management

AM utilises a structured framework which applies a scientific methodology to designing, implementing and evaluating activities.[171] It is this structured process which sets AM apart from a "trial and error" approach, which essentially consists of adopting a management strategy, followed by an ad hoc revision of the strategy if the original strategy did not achieve the desired results.[172] AM involves the following steps:[173]

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[168] Department of Conservation, *The New Zealand Biodiversity Strategy 2000-2020* (2000) at 137.

[169] Jaeckal, above n 33, at 58.

[170] Rosie Cooney "A Long and Winding Road? Precaution from Principle to Practice in Biodiversity Conservation" in Elizabeth Fisher, Judith Jones, and René von Schomberg (eds), *Implementing the Precautionary Principle: Perspectives And Prospects* (Edward Elgar Publishing, 2006) 223 at 238.

[171] Cecilia Engler "Beyond rhetoric: navigating the conceptual tangle towards effective implementation of the ecosystem approach to oceans management" (2015) 23 Environ Review 288 at 293.

[172] At 293. See *Newcastle and Hunter Valley Speleological Society Inc v Upper Hunter Shire Council and Stoneco Pty Ltd* [2010] NSWLEC 48 at [183], where Preston CJ aptly noted "adaptive management is not a "suck it and see", trial and error approach to management."

[173] Craig and Ruhl, above n 10, at 7; The Committee on Endangered and Threatened Fishes in the Klamath River Basin: National Research Council, Endangered and Threatened Fishes in the Klamath Basin; Causes of Decline and Strategies for Recovering (2004) 332-335. See also: *Crest Energy Kaipara Limited v Northland Regional Council* [2009] NZEnvC 374 (22 December 2009) at [101].

(1) the definition of the problem;
(2) determination of goals and objectives for the management of ecosystems;
(3) determination of the ecosystem baseline;
(4) development of conceptual models;
(5) selection of future restoration options;
(6) implementation of management actions;
(7) monitoring the ecosystem response; and
(8) evaluation of restoration efforts and proposals for remediation actions.

Hulme-Moir summarises these steps into three key parts:[174]

(1) determination of management goals and determination of ecosystem baseline;
(2) the application of management actions; and
(3) the monitoring, evaluation, and adjustment of management actions.

AM can be conceptualised as being located on a spectrum, with a focus on research and learning on one end and a focus on implementation and management on the other.[175] An "active AM" approach is located down the learning end of the spectrum and has been described by Walters as a "deliberate probing for information".[176] An active AM approach consists of a multi-step process involving ecological modelling, the intentional generation of scientific hypotheses and field experimentation through careful interventions with the aim of testing the original scientific hypotheses.[177]

[174] William Hulme-Moir "Risk and Uncertainty in New Zealand's Fisheries Management: Adaptive Management under the Fisheries Act 1996" (2017) 21 NZJEL 229 at 236.

[175] Arlene Kwasniak "Use and Abuse of Adaptive Management in Environmental Assessment Law and Practice: A Canadian Example and General Lessons" (2010) 12 J Env Assessment Policy Management 425 at 433.

[176] Carl Walters *Adaptive Management of Renewable Resources* (Macmillan, New York, 1986) at 232.

[177] BC Karkkainen "Panarchy and adaptive change: around the loop and back again" (2005) 7(1) Minn J L SCI & TECH 59 at 70.

In contrast, a "passive AM" approach focuses on managing the effects of an activity, rather than deliberately experimenting to gain new knowledge of the environment.[178] The essence of a passive AM approach is captured in Ruhl's definition of AM as "an iterative, incremental decision-making process built around a continuous process of monitoring the effects of decisions and adjusting decisions accordingly."[179] Under passive AM, a management plan is adopted based on historical data and experience, with the implementation of the plan monitored and adjusted to achieve better management.[180] Karkkainen notes that natural resource management has more commonly adopted a passive AM approach over an active AM approach.[181]

2 Adaptive Management v Traditional Environmental Management

Decisions concerning whether an activity should be approved, and if so under what conditions, are traditionally made at the beginning of the process. The desire for legal certainty often results in a limited scope to reconsider the initial decision.[182] In contrast, AM views the "front-loading" of decisions as a weakness, as it means regulatory decisions are often based on incomplete information.[183] Instead, AM allows for changes to an activity to be made at the "back end" when the effects of the activity are better known.[184] By reducing the weight placed on the initial decision, AM could be conceived as reducing the "social commitment" on the initial environmental impact assessment

[178] At 70; Kwasniak, above n 175, at 433.

[179] Ruhl, above n 7, at 28; see Karkkainen, above n 177, at 71.

[180] Kwasniak, above n 175, at 433.

[181] Karkkainen, above n 177, at 71.

[182] JB Ruhl "Taking Adaptive Management Seriously: A Case Study of the Endangered Species Act (2003–04)" 52 Kansas L Rev 1249 at 1252; Ruhl above n 7, at 30; See Holling, above n 8, at 188, where it is stated that "prediction and traditional 'environmental impact assessments' supposed that there is a 'before' and 'after', whereas environmental management is an ongoing process."

[183] Mary Angelo "Stumbling Toward Success: A Story of Adaptive Law and Ecological Resilience" (2009) 87 Nebraska L Rev 950 at 965; Sidney Shapiro and Robert Glicksman "The Missing Perspective" (2003) 20 Env Law Forum 42 at 42-43. See Holling, above n 182, at 188, where it is stated that an "environmental assessment should be an ongoing investigation into, not a one-time prediction of, impacts."

[184] Ruhl, above n 7, at 30.

(EIA), allowing for changes to be made to the activity as the models used for the EIA are adjusted to account for new, previously unconsidered, information.[185]

The importance AM places on learning to reduce the uncertainty of the effects of an activity was captured in a recent decision by the New Zealand High Court (NZHC) in *The Taranaki-Whanganui Conservation Board v The Environmental Protection Authority*.[186] The case concerned an appeal of a decision[187] by the Environmental Protection Authority (EPA) to grant both marine and marine discharge consents to Trans-Tasman Resources Ltd to mine iron-sand in the South Taranaki Bight within New Zealand's exclusive economic zone. The key issue for the Court was whether the monitoring and other conditions placed on the consent amounted to an AM approach under the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (EEZ Act),[188] as an AM approach is not allowed under a marine discharge consent.[189] The main conditions which, when combined, were claimed to constitute an AM approach included:[190]

1. A two-year period of pre-commencement monitoring of 16 matters;

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[185] See Ch II, s A.

[186]*The Taranaki-Whanganui Conservation Board v The Environmental Protection Authority* [2018] NZHC 2217.

[187] Environmental Protection Authority *Decision on an Application by Trans-Tasman Resources Ltd to excavate iron sand from the seabed of the exclusive economic zone in the South Taranaki Bight* (3 August 2017).

[188] See *The Taranaki-Whanganui Conservation Board v The Environmental Protection Authority*, above n 186, at [350].

[189]Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012, s 64(1AA). See *The Taranaki-Whanganui Conservation Board v The Environmental Protection Authority*, above n 186, at [348], where the Court noted "it is not obvious why [New Zealand's] Parliament chose to classify the discharge of the residue of seabed mining activities as the discharge of a hazardous substance (and thereby make adaptive management unavailable). It cannot have been to further in [sic] New Zealand's international obligations because the relevant international conventions restrict the prohibition of adaptive management to dumping rather than discharge."

[190] At [378].

2. A requirement for the consent holder to demonstrate recovery of the macroinfauna benthic community within 5 years following completion of seabed material extraction where mining first occurred;
3. A requirement that extraction activities cease if suspended sediment concentration limits were exceeded; and
4. Various conditions requiring an operational response from the Consent Holder as a result of information obtained from monitoring.

The Court held that what distinguished the monitoring and reporting conditions in the present case from what the Court termed "normal monitoring conditions" was that the purpose of the monitoring was not simply to ensure compliance with environmental standards, but rather "monitoring to establish what the environmental baselines are, because of the uncertainty or inadequate information coupled with a potential modification or cessation of the activity, depending on the circumstances revealed by the information."[191] Therefore, in order for conditions to amount to an AM approach under the EEZ Act, the conditions on the consent need to be used "as a tool for managing uncertainty".[192] As such, the case emphasises the nature of AM as a tool to increase knowledge and reduce the uncertainty of the impacts of the activity on the ecosystem, rather than a mechanism chiefly aimed at ensuring compliance.

3 When Should Adaptive Management be used in Environmental Management?

The New Zealand Supreme Court (NZSC) has stated the following criteria should be used by decision-makers to determine the suitability of an AM approach for a particular activity:[193]

(a) The extent of the environmental risk (including the gravity of consequences if the risk is realised);
(b) The importance of the activity;
(c) The degree of uncertainty; and

[191] At [401].

[192] At [404].

[193] *Sustain our Sounds Inc v New Zealand King Salmon* [2014] NZSC 40 (2014) 17 ELRNZ 520 at [139].

(d) The extent to which an adaptive management approach will sufficiently diminish the risk and uncertainty. The overall question is whether an adaptive management approach can be considered consistent with a precautionary approach.

Although the criteria were made in the context of New Zealand's RMA, the overall criteria of whether an AM approach can be considered consistent with a precautionary approach is likely to be of particular relevance to the exploitation contracts due to the proposed incorporation of the precautionary approach in the exploitation regulations. In recognition of the nuanced definition of effects under the RMA, the NZSC noted an AM approach may not be suitable if there remains a small risk of annihilating a rare or endangered species. In contrast, an AM approach may be suitable if an activity poses a higher risk of harm, but with less damaging consequences.[194]

The NZSC further noted there must be an adequate evidential foundation to provide the decision-maker with a reasonable assurance the AM approach will achieve its goals of sufficiently reducing uncertainty and adequately managing any remaining risk.[195] While each situation will depend on its own facts, in the New Zealand seabed mining context, baseline monitoring and real data, in addition to the modelled data provided by the applicant, was required to give the Environmental Protection Authority reasonable assurance that the AM regime would sufficiently reduce uncertainty and manage any remaining risk.[196]

[194] See *Sustain our Sounds Inc v New Zealand King Salmon*, above n 193, at [139].

[195] At [125].

[196] Environmental Protection Authority, *Decision on an Application by Trans-Tasman Resources Ltd to excavate iron sand from the seabed of the exclusive economic zone in the South Taranaki Bight* (18 June 2014) at [800].

4 What Must Adaptive Management Contain to be an Acceptable Environmental Management Technique?

In *New Zealand King Salmon Requests for Plan Changes and Applications for Resource Consent*,[197] the Board of Inquiry outlined four requirements for AM to be an acceptable method for managing the environmental effects of an activity:[198]

(1) there must be good baseline information about the receiving environment;
(2) he conditions must provide for effective monitoring of adverse effects using appropriate indicators;
(3) thresholds must be set to trigger remedial action before the effects become overly damaging; and
(4) effects which could arise must be able to be remedied before they become irreversible.

These requirements were subsequently upheld by the NZSC.[199] Although the decision was made in the context of the RMA, arguably these requirements are broad enough to capture the general essence of AM and can thus be incorporated into other regulatory regimes. The remainder of the dissertation will focus on the fourth requirement and consider procedures the ISA can adopt to ensure any effects from deep seabed mining are remedied before they become irreversible.

For an AM approach to be successfully implemented, management practice must be continually evaluated and refined in light of new scientific information.[200] As Ruhl states, "the central objective for institutional design is quite apparent: decision-makers need to be in a position to adjust decisions based on reliable monitoring feedback."[201] A mechanism for altering the course of the activity is important to ensure the knowledge

[197] *New Zealand King Salmon Requests for Plan Changes and Applications for Resource Consent*, above n 166.

[198] At [181].

[199] *Sustain our Sounds v New Zealand King Salmon*, above n 193, at [133].

[200] *Golden Bay Marine Farms v Tasman District Council*, above n 166, at [402]. Jaeckal, above n 80, at 205; Craig and Ruhl, above n 10, at 18.

[201] Ruhl, above n 179, at 55.

gained through an AM approach can be applied to reduce harm to the environment.[202] Such a mechanism may result in technological and operational changes to the activity.[203] In certain situations, the mining activity may have to be down-scaled, put on hold, or in cases where potentially irreversible harm is being caused to the environment, the activity may need to be terminated.[204] As Doremus pertinently stated, "a management program cannot be adaptive unless decisions are always subject to re-evaluation in light of new information."[205]

5 A Staged Approach: A Practical Way of Implementing Adaptive Management?

The ISA has considered the use of a staged approach to mineral exploitation as a possible way to implement an AM framework.[206] MacDonald and Styles argue a staged approach offers a relatively straightforward method of implementing an AM approach in a way which can reduce both the environmental and economic risks of an activity.[207] Under a staged approach, an activity will only be allowed to proceed if the impacts of the prior stage are deemed to be acceptable.[208] A staged approach could be conceptualised as containing a presumption against further development unless the results of modelling demonstrate there is an ecological "green light". In contrast, a "trial and error" approach could be conceptualised as containing a presumption in favour of development, unless

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[202] Craig and Ruhl, above n 10, at 30.

[203] See Craig and Ruhl, above n 10, at 35, where it is stated, in relation to AM generally, that as new information from the monitoring becomes available to decision-makers, objectives, models or performance criteria may require alteration or recalibration.

[204] See Craig and Ruhl, above n 10, at 53; *Golden Bay Marine Farmers v Tasman District Council*, above n 166, at [461] and *Crest Energy Kaipara Limited v Northland Regional Council*, above n 173, at [101], where the Court held there must be a "Real ability to remove all or some of the development that has occurred at that time if the monitoring results warrant it".

[205] Holly Doremus "Adaptive Management, the Endangered Species Act, and the Institutional Challenges of "New Age" Environmental Protection" (2001) 41 Washburn L.J. 50 at 55. See also Ruhl, above n 179, at 35.

[206] Clark and others, above n 125, at 4-6.

[207] See Jan McDonald and Megan Styles "Legal Strategies for Adaptive Management under Climate Change (2014) 26(1) JEL 25 at 44, 45.

[208] At 44.

monitoring shows the activity is causing environmental harm. Development of the activity is often staged in a spatial sense, with the first stage having a small physical footprint to ensure the impacts of the activity are easier to manage. As further monitoring reduces the uncertainty of any potential impacts of the activity on the environment, the activity can expand in stages over a larger area.[209]

Provided the first stage is designed to produce the comparative information needed to inform the design of the exploitation operations, a staged approach arguably presents a good method of implementing an AM approach.[210] However, it is important any staged approach to development allows for administrative flexibility throughout the lifetime of the activity.[211] In certain circumstances, it may be appropriate for the ISA to require the contractor to alter or suspend operations even after the mining operation has progressed to its final stage. Therefore, although a staged approach undoubtedly offers a practical method of operationalising AM,[212] procedures must be in place to ensure there remains regulatory flexibility throughout the lifetime of the project.[213]

[209] At 44; *Telstra Corporation Ltd v Hornsby Shire Council*, above n 161, at [16].

[210] Jaeckal, above n 9, at 210.

[211] At 210.

[212] See Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012, s 64(4), which states a stage "may relate to the duration of the consent, the area over which consent is granted, the scale or intensity of the activity, or the nature of the activity."

[213] Jaeckal, above n 9, at 210.

III Shaped by Context: Adaptive Management Under the Exploitation Contract

Central to the design of an AM procedure is a mechanism which enables the decision-maker to alter or terminate mining operations if monitoring feedback demonstrate serious environmental harm is occurring.[214] However giving the decision-maker a high level of flexibility can create a tension with the resource user's desire for certainty. The LTC has recognised this tension, noting the future exploitation regulations need to provide for the "delicate balance" between flexibility and adaptability on the one hand and certainty and predictability for the contractor on the other. The aim of this Chapter is to consider how the regulatory context of the Convention can provide a guiding light to this balance could be incorporated into an AM approach under the exploitation contract.

The Chapter will begin by outlining why the current exploration contracts do not contain the procedural mechanisms to allow for the flexibility that AM requires. It will argue the lack of administrative flexibility available under the exploration contracts is due to the prioritisation of contractor's "property right" over the ISA's regulatory role under the Convention. It will then put forward an argument that the scheme of the Convention more accurately points to the relationship between the contractor and ISA being governed under public law principles. Conceiving the exploitation contract as a public law instrument means the ISA's role as a regulator should take precedence over its role as a "contract partner", with the scope of its discretion under an AM approach more appropriately constrained by administrative law principles, rather principles found in contract and property law. Certainty to the contractor can be provided through a structured decision-making process incorporated into the exploitation contract.

[214] See ch II, s C(4).

A Adaptive Management under Exploration Contracts

Jaeckal has identified several potential ways through which the ISA can implement an AM approach under the exploration contracts granted by the ISA.[215] The first possibility is to amend the Exploration Regulations to incorporate new environmental standards.[216] The relevant regulations are combined with the contractor's Plan of Work to form the exploration contract which creates the obligations the contractor is required to give effect to.[217] However, changes made to the regulations do not automatically bind contractors who have already been granted exploration contracts. Instead, the ISA must enter into negotiations with the contractors on an individual basis if it wishes to incorporate any changes made to the regulations into the exploration contract.[218] Such a procedure does not give the ISA the ability to require changes be made to the contractor's operations on the basis of new information.

Another option potentially open to the ISA is to review a contractor's Programme of Activity.[219] The Programme of Activity sets out the specific activities a contractor will undertake throughout the following five-year period and, as it is annexed to the exploration contract, is binding on the contractor.[220] The purpose of the review is to assess the activities which occurred over the past five years.[221] However, under the current review procedure, the ISA is not able to incorporate new environmental standards into the following five-year programme of activities. Therefore, the review effectively forms a compliance purpose, rather than giving the Secretariat an ability to review the environmental standards applicable to the contractor's future operations.

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[215] Jaeckal, above n 9, at 205.

[216] At 207. See Chapter I, s D.

[217] At 207.

[218] At 207.

[219] The programme of activity is reviewed by the ISA Secretary-General every five years.

[220] Jaeckal, above n 9, at 208; see, e.g., Sulphides Regulations, annex III, annex IV section 4.

[221] At 208. The review of the programme of activities is conducted jointly by the contractor and the Secretary-General of the ISA.

The third potential way the exploration contracts could provide for AM is through the amendment of "Recommendations".[222] Recommendations are created and adopted by the LTC to help contractors implement the Regulations and are generally of a technical or procedural nature.[223] Significantly, the LTC can flexibly amend recommendations,[224] which the contractors must "observe, as far as reasonably practicable".[225] Although a relatively strong direction, the phrase creates a level of discretion for the contractors, meaning changes to recommendations cannot be considered strictly binding on contractors.[226]

A fourth potential option to implement an AM framework under the exploration contracts would be for the ISA to update regional environmental plans. At present, the only regional plan in existence is the Environment Management Plan for the Clarion-Clipperton Zone ("EMP-CCZ").[227] The EMP-CCZ is a spatial management plan which covers the Clarion-Clipperton Zone, where a large amount of deep-sea minerals are thought to be located.[228] The EMP-CCZ foresees flexibility for the nine no-mining areas to allow for advances in scientific knowledge and can be altered without the consent of the contractors.[229] However, the EMP-CCZ's legal status is not clear. As a result, it does not attempt to create new obligations for existing contractors.[230]

Therefore, the ISA's current procedural framework for regulating exploration contracts arguably does not give ISA the flexibility required to implement an iterative AM framework. The lack of administrative flexibility available to the ISA under the exploration contracts may be caused, at least partially, by a prioritisation of investment

[222] At 207.

[223] At 207; See, e.g., Sulphides Exploration Regulations, regulation 41(1).

[224] At 207.

[225] See, e.g., Sulphides Exploration Regulations, annex IV section 13.2.

[226] At 208.

[227] Environmental Management Plan for the Clarion-Clipperton Zone, ISBA/17/LTC/7 (13 July 2011).

[228] Jaeckal, above n 9, at 208.

[229] At 208.

[230] At 208; see Environmental Management Plan for the Clarion-Clipperton Zone para 41(a).

certainty and predictability for the contractor base. The next section aims to stand back and consider the wider regulatory context of the Convention to consider how the exploitation contracts should provide for the balance between administrative flexibility and certainty for the contractor.

B Considering the Nature of the Contract

1 The Hypothesis

The emphasis the exploration regulations appear to place on certainty over flexibility may stem from ideologies traditionally found in property and contract law being incorporated into various articles of Part XI, most notably Article 153.[231] Article 153 summarises the system for exploration and exploration in the Area,[232] setting down the norms from which the basic conditions for prospecting, exploration and exploitation in contained in Annex III are based.[233] The Article provides for the Plan of Work to be in the "form of a contract" concluded between the ISA and the applicant.[234] It further provides in paragraph 6 that a contract between ISA and the contractor "shall provide for security of tenure".[235] Paragraph 6 then links the security of tenure concept with the ability to revise the contract, noting that, "Accordingly, the contract is not able to be revised, suspended or terminated unless it is done so in accordance with Annex III, articles 18 and 19."[236]

The incorporation of property and contract law principles into Article 153 could be argued to give the relationship between the ISA and the contractor a private law flavour. Such a private law flavour may have manifested in the design of the exploitation contract through an emphasis on protecting the contractor's security of tenure at the expense of

[231] UNCLOS, art 153.

[232] Nandan, Lodge and Rosenne, above n 55, at [153.1].

[233] At [153.2].

[234] UNCLOS, art 153(3). See also annex III, art 3.

[235]Art 153 (6) See Nandan, Lodge and Rosenne, above n 55, at [153.14(f)], where it is stated art 153(6) "establishes another fundamental principle which is that a contract with the Authority shall provide for security of tenure."

[236] UNCLOS, art 153(6).

regulatory flexibility. A comparable argument has been made concerning the ability to implement an AM approach in New Zealand's fishing industry.[237] Hulme-Moir argues that the Fisheries Act 1996 (NZ) has been structured in a way which prioritises the private property interests of the commercial fishing industry in the fish stock over administrative flexibility aimed at ensuring the sustainability of the resource.[238] Arguably the emphasis placed on protecting private property interests creates a conflict with AM as "AM is grounded in an ecosystem ideology which places environmental sustainability ahead of human interest."[239]

At this point, it is prudent to note that characterising the legal nature of a relationship between a regulator and an organisation is complex.[240] The aim of the following section is not an attempt to definitively characterise the nature of the relationship between the ISA and contractor under an exploration or exploitation contract, but rather to hypothesise whether conceptualising the contract either a public law or private law instrument has wider ramifications for the amount of administrative flexibility which should be provided for under future exploitation contracts.

2 Flexibility under a Private Law Relationship

Contract law allows for flexibility to be achieved under a contract in certain situations if it is clear all parties have agreed to give one party a power to unilaterally alter the contract.[241] The importance of flexibility in contracts which reflect and adapt to the changing nature of relationships between parties is reflected in the relational theory of

[237] Hulme-Moir, above n 174.

[238] At 272.

[239] At 272-273.

[240] See, e.g. B Barton, "Property Rights Created under Statute in Common Law Legal Systems" in A McHarg and others (eds) Property and the Law in Energy and Natural Resources (Oxford University Press, Oxford, 2010) 80–99; Barry Barton "The nature of resource consents: statutory permits or property rights" NZLS Seminar, Wellington, 2009); Laura Fraser "Property Rights in Environmental Management: The Nature of Resource Consents in the Resource Management Act 1991" (2008) 12 NZJEL 145.

[241] See Ian MacNeil *The Relational Theory of Contract: Selected Works of Ian MacNeil* David Campbell (ed) (Sweet & Maxwell, London, 2001) at 223.

contract,[242] and can commonly be found in agreements ranging from employment contracts,[243] to gas balancing and joint operating agreements ("JOA") in the oil and gas industry,[244] to rent review conditions common in commercial leasing arrangements.[245] Conceptualising the relationship between the ISA as governed under private law principles should not prevent the ISA from incorporating the procedural flexibility required to implement an AM approach into the future exploitation contracts. However, it would be prudent for the ISA to consider concepts such as sanctity of contract, consideration,[246] and the "takings" doctrine in property law, which may constrain administrative flexibility under an AM approach if not considered carefully.[247] For example, Grinlinton notes the change in the nature of minerals permits in New Zealand, from "leases"[248] under the Coal Mines Act 1979 to the current characterisation under the Crown Minerals Act 1991 as "neither real nor personal property"[249] may have been driven partially by the aim of the government to prevent claims for compensation for

[242] For greater detail on the relational theory of contract, readers should consult MacNeil, above n 241.

[243] See, e.g. *Bateman v Asda Stores* [2010] IRLR 370.

[244] See, e.g. *Todd Pohokura Limited v Shell Exploration NZ Limited* [2015] NZCA 71.

[245] See MacNeil, above n 241, at 223.

[246] See at 223, where it is stated "to cope with the difficulties created by its own doctrine of consideration, the transactional legal structure has produced, however, a wide range of concepts, provisions, and other devices limiting the impact of the doctrine. The drafter desiring to achieve workable flexibility must be aware of both the limitations the law imposes on the techniques that may be used and the opportunities it offers."

[247] See David Grinlinton "Evolution, Adaptation, and Invention: Property Rights in Natural Resources in a Changing World" in David Grinlinton and Prue Taylor (eds) *Property Rights and Sustainability: The Evolution of Property Rights to Meet Ecological Challenges* (Martinus Nijhoff Publishers, Leiden, 2011) 275 at 297.

[248] See *Tainui Maori Trust Board v Attorney-General* [1989] 2 NZLR 513 at 519-525 per President Robin Cooke (as he then was) concerning coal mining leases under the Coal Mines Act 1979 (NZ).

[249] Crown Minerals Act 1991 (NZ), s 92(1). However, the reader should note the characterisation of minerals permits in the New Zealand context is complex in practice: See Grinlinton, above n 247, at 297.

"takings" of property rights where mining permits were withdrawn or otherwise modified to the detriment of the permit holder.[250]

3 Recasting the Relationship in Public Law Terms

A second, and perhaps more fundamental, point to note is that conceptualising the relationship between the ISA and the contractor as being governed by private law principles may fail to recognise the important regulatory role the ISA has over mining activities taking place on the deep seabed. The regulatory role of the ISA is perhaps framed most strongly in Articles 153(4), which gives the ISA responsibility to "organise, carry out, and control activities in the Area", and 162(2)(1), which requires the Council to "exercise control over activities in the Area."[251]

The nature of a formal relationship between a public regulatory body and a private organisation was considered in two contrasting cases in the England and Wales High Court Administrative Court ("EWHC (Admin)"). In *R (Dean) v Secretary of State for Business, Energy and Industrial Strategy,*[252] the Court was required to decide whether a petroleum licence granted under the Petroleum Act 1998 (UK) was a statutory instrument governed under public law or a contract subject to ordinary contract law principles. The Court observed that the starting point of any analysis into whether an instrument is to be governed under public or private law principles is the relevant legal framework under which the grant was issued, with the label used[253] to describe the instrument not being a relevant consideration.[254] In that case, the court held a Petroleum Exploration and Development Licence granted under the Petroleum Act was a private contract. Central to the Court's reasoning was the fact the Petroleum Act did not create any regulatory

[250]See Grinlinton, above n 247 at 297. Sections 36 and 39 of the Crown Minerals Act (NZ) allow changes to permits and their revocation by the Minister of Energy and Natural Resources under certain circumstances. See also Ch III, s C(3).

[251] UNCLOS, arts 153(1), 162(1); See Jaeckal, above n 54, at 9.

[252] *R (Dean) v Secretary of State for Business, Energy and Industrial Strategy* [2017] EWCH 1998 (Admin)(Holgate J).

[253] For example, contract, permit, consent or licence.

[254] *R (Dean) v Secretary of State for Business, Energy and Industrial Strategy*, above n 252, at [20]-[21].

functions for the licensing authority when granting a petroleum licence, such as to regulate a market or protect or promote the interests of consumers of parties affected by the activities of licensees. Essentially, the Court held the Petroleum Act provided a regime under which the Crown could divest itself of the exclusive rights it otherwise had to search for and get petroleum.[255]

In contrast, in *Data Broadcasting International Limited v Ofcom*,[256] the EWHC (Admin) held licences granted by Office of Communications ("OFCOM") under the Broadcasting Act 1990 (UK) were to be treated as a public law instrument, with principles of contract and property law not being determinative to the relationship between OFCOM and the broadcasting companies.[257] The Court made the point that, if the licences were to be treated as contracts, OFCOM may have been exposed to liability for damages, which would have been inconsistent with OFCOM's role and responsibilities as a regulator.[258]

Interestingly, the Court was also concerned that imposing a private law contractual relationship may impose on OFCOM's duties to act in the public interest, as required by the legislation, particularly to secure the optimal use of the broadcasting spectrum.[259]Although the regulatory context of OFCOM and the ISA are significantly different, it may be possible to make an analogy with the Court's reasoning and the ISA's obligation to regulate activities in the Area for the benefit of humankind.[260] The power the CHM principle gives ISA is perhaps best illustrated by the LOSC's benefit-sharing provisions.[261] Under the benefit-sharing provisions, financial and other economic benefits sourced from activities in the Area, including DSM, are to be distributed equally by the ISA for the benefit of humankind.[262]

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[255] At [128].

[256] *Data Broadcasting International Limited v Ofcom* [2010] EWHC 1243 (Admin).

[257] At [88].

[258] At [94].

[259] At [94].

[260] UNCLOS, art 140.

[261] Jaeckal, above n 9, at 209.

[262] UNCLOS, arts 140(2); 157(1).

As Jaeckal pertinently states, the ISA needs to be understood as much more than simply a contract partner with prospective contractors.[263] In addition to its role as a contract partner, the ISA fulfils multiple roles, including:[264]

(1) trustee of the Area, requiring it to act for the benefit of humankind as a whole;
(2) regulator and administrator of resources in the Area;
(3) decision-maker on whether to grant contracts;
(4) being responsible for ensuring the effective protection of the marine environment; and
(5) having the potential to engage in mining activities itself through the Enterprise.

As a consequence of the ISA wearing multiple "hats", a departure from "governance-as usual" principles is arguably required.[265] The ISA appears to have reached a similar conclusion, with the ISA Technical Study 11 noting:[266]

> […] the ISA will need to reserve for itself substantial power and authority to manage, regulate and oversee the exploitation regime based upon the principles of:
> 1. High sensitivity to environmental concerns and use of the precautionary principle.
> 2. Highly technical and as yet unknown challenges associated with successful deep ocean mining.
> 3. Obligation to preserve and to direct benefit flows to the developing world.
> 4. Actively demonstrating good governance.
> 5. Maintaining the reputation of the UN as a fair, independent and competent regulator.

As part of its role, the ISA is given the difficult task of balancing the economic, social and environmental goals contained in the Mining Code. This contrasts with other regulators of mineral permits. For example, New Zealand's Ministry of Business,

[263] Jaeckal, above n 9, at 209.

[264] At 209.

[265] At 210.

[266] Clark and others, above n 125, at 20.

Innovation and Employment,[267] are primarily concerned with the economically efficient extraction of minerals.[268] The fact the ISA is required to give effect to numerous, and at times potentially conflicting,[269] policy objectives lend further weight to the argument the ISA requires flexibility and strong regulatory powers. Therefore, when the ISA's "fiduciary" duties to humankind come into conflict with their "contractual" duties owed to contractors under the contract, the overall scheme of the Convention arguably suggests the fiduciary duty to humankind as a whole under the CHM principle should take priority. As such, the exploitation contracts should be designed to ensure the ISA has the flexibility to consider the concerns of wider humankind when performing its obligations under the contract.

C Operationalising Adaptive Management in the Exploitation Contracts

1 A "Co-Regulatory" Approach to Adaptive Management

The last section concluded by emphasising the important regulatory role the ISA has been given under the Convention. The next issue requiring consideration is how the nature of the ISA's role under the Convention can be applied to the context of AM. In particular, what should "control" mean in the context of AM techniques under future exploitation contracts?

Under traditional development scenarios, the resource user typically prefers to control how the physical resource is utilised.[270] In the context of deep seabed mining, for example, a contractor is likely to want to maintain control over how the exploitation of the mineral resource is conducted. The role of the regulator under this traditional scenario is focussed on maintaining the integrity of the natural resource.[271] In the context of deep

[267] Who are responsible for administering mineral permits under the Crown Minerals Act 1991 (NZ).

[268] Crown Minerals Act, s 1A; See *Greenpeace of New Zealand Incorporated v The Minister of Energy and Resources* [2012] NZHC 1422.

[269] See Ch I, s D(4).

[270] See *Golden Bay Marine Farmers v Tasman District Council*, above n 166, at [409].

[271] At [409].

seabed mining, this may involve protecting water quality or the health of the marine ecosystem.

In contrast, the NZEnvC in *Golden Bay Marine Farmers v Tasman District Council* emphasised how an AM approach under the Resource Management Act (NZ) requires a co-regulatory approach.[272] Under a co-regulatory approach, the regulator is involved in the management of how the activity is conducted, rather than primarily being involved in an enforcement sense to ensure compliance with the conditions of the permit. In that case, the court held a co-regulatory approach involved the regulator being involved in aspects of the activity which included the:[273]

(1) designing and implementing management plans;
(2) reviewing the conditions of the consent;
(3) monitoring programmes; and
(4) the staged development of the project.

The regulatory context under the Convention arguably suggests the ISA should have a similar co-regulatory function under an AM framework in the exploitation contracts. Firstly, the ISA is under a direct duty to ensure activities in the Area are carried out for the benefit humankind as a whole.[274] The ISA's role as a sort of trustee for humankind[275] is not found under the Resource Management Act, where, at least in theory, the role of the regulator is more simply to manage the effects of an activity.[276] Secondly, the Convention contains strong environmental bottom lines[277] which, when combined with a precautionary approach, arguably requires activities to be adjusted prior to harm

[272] At [409].

[273] At [409].

[274] UNCLOS, art 140.

[275] See Bourell and others, above n 79, at 3.

[276] See, e.g., Warnock and Galloway, above n 148, at 1.26.

[277] UNCLOS, art 145.

occurring.[278] Thirdly, the ISA already has the power to make emergency orders which require contractors to suspend or adjust operations to prevent serious harm from occurring.[279] A co-regulatory approach under an AM approach in the exploitation contract could be seen as building on this requirement and creating a procedure to ensure that the ISA's control over mining activities in theory is also applicable in practice.

2 Balance Through Process

Adaptive management may also require a re-conceptualisation of the traditional conception of certainty. Law generally prefers decisions made to be final and certain, so parties are aware of their position and can arrange their affairs accordingly.[280] However, the idea that a one-off, final decision can be made, without the opportunity to revisit it further down the track, does not sit comfortably with AM. AM allows for initial decisions to be classified as hypotheses made in the face of uncertainty, which are subsequently tested and re-evaluated as additional information becomes available.[281] Therefore, any definition of "certainty" under an AM approach will already incorporate a degree of flexibility. The question then becomes how the contractor can be provided with a degree of certainty and stability, notwithstanding the flexibility inherent in an AM approach.

One way of providing certainty to the contractor, whilst allowing the ISA to have the administrative flexibility to implement an AM approach, could be to explicitly acknowledge the relevance of risk and uncertainty when entering into exploitation contracts.[282] It would need to be made clear to the contractor at the time of entering into the contract that the terms of the contract were approved on the basis of existing scientific knowledge of the deep-sea environment and technological advancement, both of which

[278] See Ch II, s B.

[279] UNCLOS, arts 162(2)(w) and 165(2)(k).

[280] Jamie Benidickson and others *Practicing Precaution and Adaptive Management: Legal, Institutional, and Procedural Dimensions of Scientific Uncertainty, Report to the SHHRC and Law Commission of Canada* (UOIE, Ottawa, 2005) at F-7.

[281] At F-7.

[282] At F-7.

are likely to change over the term of the contract.[283] In the contract itself, boilerplate terms could be drafted to provide for a review of the conditions if new knowledge concerning the impact of the activity on the marine environment comes to light. Such a review condition could be incorporated into the contractor's Environmental Management and Monitoring Plan.[284]

A comparable approach is taken several statutes managing resource extraction in New Zealand. Under the Resource Management Act, a consent authority[285] can review the conditions of a resource consent for any purpose specified in the consent.[286] Under the Crown Minerals Act, the Minister can amend the conditions of a permit in the manner the permit provides.[287] Further, the EEZ Act allows the EPA to review the conditions of a marine consent:[288]

> If information becomes available to the EPA that was not available … when the consent was granted and the information shows that more appropriate conditions are necessary to deal with the effects of the exercise of the consent.

If the ISA were to adopt a similar approach, the balance between flexibility and certainty would be achieved through the incorporation in the contract of a formal amendment procedure outlining the process by which decisions to review the contract would be

[283] See Bendickson and others, above n 280, at F-7.

[284] See Draft Exploitation Regulations, annex VII(g), where it is proposed the contractor include an adaptive management technique, if appropriate, in the contractor's Environmental Management and Monitoring Plan. See also *Golden Bay Marine Farms v Tasman District Council*, above n 166, at [407]-[408], where the NZEnvC note the content management plans on large developments could incorporate review conditions, amongst other conditions.

[285] A regional council, a territorial authority, or a local authority that is both a regional council and a territorial authority, whose permission is required to carry out an activity for which a resource consent is required under [the RMA]: Resource Management Act (NZ), s 2.

[286] Resource Management Act (NZ), s 128(a)(iii). A similar process is also contained in the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act (NZ), s 76(1)(ii).

[287] Crown Minerals Act (NZ), ss 36(1)(c), 36(2)(a).

[288] Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act (NZ), s 76(1)(e).

made.[289] The key to legitimising any formal amendment procedure lies in ensuring principles of good governance are followed. This would involve considering how principles such as natural justice, public participation, transparency and review could be incorporated into the amendment procedure to create a process which the ISA would need to follow when making decisions under an AM approach.[290]

An example of such a process working in practice can be found in the US Constitution, which contains a formal amendment procedure in Article V.[291] The Constitution has been amended 27 times through this procedure.[292] Under the future exploitation contracts, such a formal amendment procedure could specify:[293]

(1) What decisions have to be made;
(2) By which people;
(3) At which level of the agency;
(4) At what time;
(5) Which parties must be consulted, and if so, how should they be consulted;
(6) Who must be informed of the decision outcome; and
(7) Whether the decision be challenged or reviewed in any way.

It is through a well-designed process that certainty and stability can be provided to the contractor, while also ensuring the legitimacy of the ISA's administrative flexibility under the contract.[294] In the words of Maclean "the process can become a purpose."[295]

[289] See Robin Craig and others "Balancing stability and flexibility in adaptive governance: an analysis of tools available in U.S. environmental law" (2017) 22(2) Ecology and Society 3 at 8.

[290] At 7. For a more detailed discussion of the principles of good governance, see M Lockwood and others "Governance principles for natural resource management" (2010) 23(10) Soc Nat Resour 986.

[291] U.S. Const. art V.

[292] See Craig and others, above n Robin Craig, and others "A proposal for amending administrative law to facilitate adaptive management" (2017) 12 Environ Res Lett 1 at 8.

[293] See Common Compliance Capability Programme Steering Group *Achieving Compliance: A Guide for Compliance Agencies in New Zealand* (Department of Internal Affairs, June 2011) at 85.

[294] See Janet Maclean "New Zealand's Resource Management Act 1991: Process with Purpose" (1999) 7 Otago L Rev 538 at 543.

Furthermore, having an amendment procedure built into the contract would prevent the need for a formal revision of the conditions of the contract under Annex III, Article 19.[296] Therefore, such a process arguably complies with the security of tenure provisions in the Convention,[297] whilst allowing the ISA to maintain control over the exploitation activities.

[295] At 543.

[296] See *Newcastle and Hunter Valley Speleological Society Inc v Upper Hunter Shire Council and Stoneco Pty Ltd*, above n 172, at [187].

[297] UNCLOS, art 153(6), annex III, arts 18 and 19; see Ch III, s B.

IV *A Decision-Making Process Under A Flexible Adaptive Management Framework*

The key to implementing a successful AM framework for mining activities in the Area lies in balancing regulatory flexibility with fair and certain outcomes for the contractor base.[298] The provision of a formal amendment procedure in the exploitation contract offers one way of allowing for the administrative flexibility necessary for an AM approach to be implemented within a set procedural framework which can provide a level of certainty and stability for the contractor.[299] The following chapter will consider principles which should be taken into account by the ISA when designing the process of how decisions will be made under an AM approach. The principles explored are by no means exhaustive, and there are of course various alternative ways that the principles discussed could be incorporated into the decision-making process under an AM framework.

B The Decision-Maker under the Adaptive Management Framework

1 Good Environmental Decision-Making

In determining which body should make decisions under an AM framework, we can begin by looking at the elements that good environmental decision-making requires. Gregory and others argue good environmental decision-making requires the following elements:[300]

1. Good information concerning the facts (i.e. how the world is and the anticipated consequences of proposed actions).
2. Good information about values (i.e. what priorities and preferences for different outcomes are).

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[298] Legal and Technical Committee, above n 12, at para 22.

[299] See UNCLOS, arts 153(1), 162(1).

[300]Robin Gregory and others "Some Pitfalls of an Overemphasis on Science in Environmental Risk Management Decisions" (2006) 9 J Risk Res 717 at 725.

3. A process for integrating facts and values in relevant analysis and a constructive-deliberative exchange.

Gregory and others refer to the first element as "risk assessment". Science can offer significant value to the risk assessment process. It does so by determining the likely consequences of an activity on the environment, thus bringing to our attention problems which require action.[301]

In contrast to the risk assessment stage, the second and third elements of good environmental decision-making require information concerning values. Science has little expertise on values and thus is of limited help in answering questions concerning what action should be taken to address an issue ("risk management"). As Sommerville neatly summarises:[302]

> The language of risk management involves the language of values. Determining what is an acceptable or manageable risk requires a value judgment. Scientists usually prefer not to make a value judgment on behalf of society. Ultimately, environmental risk management is governed by values which determine the choices made by decision-makers, and by society at large.

While scientific knowledge gained through monitoring and reporting can provide light on the environmental impacts of the mining operation, it cannot address broader issues such as the level of harm acceptable in the deep-sea environment,[303] or how the ISA should balance the social, economic and environmental principles contained in the Mining Code.

In terms of operationalising the distinction between risk assessment and risk management in the AM context, the NZEnvC has expertise the ISA could draw upon. One example is

[301] At 725.

[302] Somerville, above n 127, at 23.

[303] See Jaeckal, above n 54, at 3.

Golden Bay Marine Farmers v Tasman District Council,[304] where the local authority approved a staged development of a mussel farm under a staged AM approach. One matter the Court was required to consider was how the decision regarding the further staging of the farm would be made. The Court decided the best option was to give ultimate decision-making authority to the local authority, which would act on the advice of a specialist "Ecological Advisory Group" (EAG)[305] made up of marine ecologists with expertise in either benthic or water column sustainability.[306] The EAG was to be selected by, and operate for the benefit of, the local authority, for the purpose of receiving and analysing the results of the ecological monitoring of the marine farm[307]. As an advisory group only, the EAG was effectively limited to the task of risk assessment, with the responsibility of the risk management stage and ultimate decision on how to proceed based on the modelling results left in the hands of the local authority.

2 Adaptive Management Decision-Making under the Exploitation Contracts

The approach taken by the NZEnvC in *Golden Bay Marine Farmers* neatly separates the role of science from the role of values and the deliberative-constructive process involved in environmental decision-making. Due to the important role of science in the risk assessment stage, it would be preferable for any risk assessment panel to be limited to marine ecologists or scientists with relevant experience. Further, to maximise objectivity, it is important that, while the panel should be funded by the contractor, any panel should be appointed by the ISA, for the benefit of the ISA.

Conducting risk management under an adaptive management approach is likely to involve the decision-maker considering the results of monitoring within an overall values framework which takes into account the concerns of the contractor and the wider public. At first glance, the LTC would appear to be the most logical body to undertake risk management decisions under an adaptive management framework. As discussed in

[304] *Golden Bay Marine Farmers v Tasman District Council*, above n 166.

[305] At [504].

[306] At [560].

[307] At [560].

Chapter I, the LTC is a specialist body which operates under the Council, with members having a range of qualifications relevant to deep-sea mining.[308] The LTC's range of expertise would appear to give them the qualifications necessary to integrate facts and values when making decisions under an adaptive management framework in the exploitation contracts.

The LTC already plays a central role in the exploration and exploitation of minerals in the Area.[309] In addition, the Convention establishes a special procedure for the approval of exploration or exploitation contracts upon the LTC recommendation, with the Council being required to approve a Plan of Work unless it is disapproved by a two-thirds majority of members present and voting in each Chamber of the Council.[310] In practice, this makes it difficult for the Council to disapprove a recommendation made by the LTC. However, whilst the LTC's role is central to the functioning of the DSM regime, at present its role is ultimately advisory. It is the Council, rather than the LTC, which has been given the power to make orders and final decisions. The LTC has deliberately been designed to use its technical expertise to advise the Council, yet ultimately remain subsidiary to the Council.[311] Therefore, any change to the nature of the LTC's role under the exploitation contracts will have to be considered to ensure the careful allocation of power under Part XI of the Convention is not upset.

At the same time, the features AM requires to operate successfully should not be forgotten. The exploitation regime will need to be prepared for multiple exploitation activities to be operating contemporaneously in the Area. It is questionable whether the current procedure of the LTC's decisions requiring the Council's approval will allow for the flexibility required by an AM approach due to the potential delay between the LTC making a decision and the Council subsequently approving it.[312] Furthermore, the

[308] See Ch I.

[309] See Ch I.

[310] 1994 Agreement, Annex, s 3(11)

[311] Nandan, Lodge and Rosenne, above n 55, at [162.10].

[312] See Legal and Technical Commission, above n 12, at para 25.

involvement of the Council could risk politicising what in many cases will be technical, operational decisions which may fall into the LTC's realm of expertise.

Entering the exploitation phase is arguably one of the most significant developments in the Area to date. The 1994 Agreement provides:[313]

> the setting up and functioning of the organs and subsidiary bodies of the Authority shall be based on an evolutionary approach, taking into account the functional needs of the organs and subsidiary bodies concerned in order that they may discharge effectively their respective responsibilities of the development of activities in the Area.

Therefore, if the Authority chooses to adopt an AM approach in the exploitation regulations, serious thought will need to be given as to how the organs and subsidiary bodies of the Authority can evolve to accommodate AM. It may be that the exploitation phase provides the ideal time for the role of the LTC to evolve to incorporate decision-making under certain situations.

One possible way of allowing the LTC's role to evolve whilst ensuring it does not upset the careful power balance between the various organs and subsidiary bodies of the ISA would be to perceive decisions of AM as being situated on a spectrum, with significant decisions, such as terminating operations, down one end of the spectrum and minor operational adaptions being located down the other end. Such a method could involve the LTC making certain decisions without requiring Council approval, whilst requiring more "significant" decisions be approved by the Council upon the LTC's recommendation. Such a method recognises the process for making decisions under an AM framework may require a more nuanced approach, rather than a "one-size-fits-all" approach.

Determining which decisions would require which decision-making process is a complicated task. Down the "significant" end of the spectrum, allowing the Council to have the final say on whether activities should be discontinued in cases of serious and/or

[313] 1994 Agreement, Annex, section 1 – Costs to States Parties and Institutional Arrangements (3).

unexpected harm would be consistent with the procedure for emergency orders contained in Articles 162(2)(w) and 165(2)(k).[314] However, defining where other decisions lie on the spectrum will be more difficult. For example, while minor technical and/or operational changes would prima facie appear to be located down the "less significant" end of the spectrum, what the ISA, contractors and other stakeholders perceive to be "minor" and/or "technical" may differ significantly. If such a decision-making method were to be implemented, consultation with stakeholders concerning which decisions in principle should ultimately lie with which body would be of primary importance.

Finally, if the ISA decides the Council should be involved in the decision-making process under AM, it would also be prudent to consider the Council's voting procedure. The current voting procedure[315] for approving the LTC's recommendations concerning Plans of Work in practice places a significant amount of trust in the expertise of the LTC. It is submitted such a procedure would be appropriate for any decisions made under an AM approach. Ultimately, the LTC has the technical expertise to decide the most appropriate outcome in each situation. Therefore, it is likely to be a rare occasion that the Council does not approve a recommendation by the LTC.

C Procedural Fairness to the Contractor

One way of ensuring procedural fairness to the Contractor is through the process of natural justice. The rules of natural justice require decisions which involve an exercise of discretion be made in a way which is "procedurally fair".[316] Natural justice works in practice by obliging decision-makers to disclose any prejudicial material, or the substance of it, to the person or group who may be affected by the decision before the decision is

[314] UNCLOS, arts 162(2)(w) 165(2)(k); See Ch 1, s D.

[315] See Ch 1, s C.

[316] T Daya-Winterbottom "The Role of Administrative Law" in Peter Salmon and David Grinlinton (eds) *Environmental Law in New Zealand* (Thomson Reuters NZ Limited, Wellington, 2015) 203 at 250.

made, for the purpose of giving that person or group a reasonable opportunity to respond to the material.[317]

Natural justice is directly concerned with the process by which a decision is made, rather than the substantive outcome of the decision,[318] albeit the process of hearing the other party may influence the outcome of the decision. The previous New South Wales Ombudsman likened natural justice to the last meal before a hanging, affirming a "fundamental principle that procedural integrity is important, whatever the substantive outcome."[319] The core aims of natural justice are to offer protection against arbitrary administrative action[320] and to ensure a person is treated fairly in any circumstance where another person or body interferes in their affairs to their detriment.[321] Requiring the ISA to consider principles of natural justice when making decisions under an AM framework could allow the ISA to retain flexibility over the substantive outcome of the decision, whilst ensuring the contractor's view is taken into account in the decision-making process.

1 Procedural Fairness in the Decision-Making Process

To ensure a fair and proper determination of the issue under AM, the ISA will need to consider how the Contractor's view can be heard and taken into account in the decision-making process. Natural justice can be perceived as lying on a spectrum. At one end of the spectrum is the concept of notification whereby parties potentially affected by a decision are notified that a decision will be made, and on what information it will be based, but no requirement for their view to be taken into account by the decision-maker. However, a process of notification is unlikely to provide satisfactory fairness or investment certainty to the contractor concerned. On the other side of the spectrum, short

[317] *Daganayasi v Minister of Immigration* [1980] 2 NZLR 130 (CA) at 143, 144 and 149.

[318] See *New Zealand Association for Migration and Investments Inc v A-G* [2006] NZAR 45 (HC) at [159].

[319] Prof John McMillan "Natural Justice: too much, too little, or just right?" (2008) 58 AIAL Forum 33 at 33.

[320] Geoffrey Flick *Natural Justice: Principles and Practical Applications* (1984) (2nd ed, Butterworths, Sydney) at v.

[321] McMillan, above n 319 at 33.

of a full hearing before a judge or arbitrator, lies the concept of a negotiation, where the parties are required to reach a consensus before a decision can be made.[322] The issue with such an approach is it would provide the same barrier to regulatory flexibility as the exploration regulations currently present.[323]

An alternative approach falling somewhere in the middle of the aforementioned processes would be a requirement for the ISA to formally consult with the contractor before making a decision under the AM framework. Although the exact features a consultation requires will be dependent on the specific circumstances which call for it,[324] the New Zealand High Court has held a consultation must be a "meaningful exercise"[325] with the Privy Council stating the requirement for a consultation "is never to be treated as a mere formality".[326] However, a consultation does not necessarily involve negotiations towards an agreement[327] and is instead an intermediate situation involving meaningful discussion.[328] In *Wellington International Airport Ltd v Air New Zealand*,[329] the Court held that a consultation in a decision-making context can be said to have occurred if the decision-maker held meetings with the parties it was required to consult, provided those parties with relevant information and with such further information as they requested, entered those meetings with an open mind, took notice of what was said and waited until they had their say before making a decision.[330] While the decision-maker can have a

[322] This is comparable to the approach taken under the exploration regulations: see Ch III, s A. See DJ Galligan *Due Process and Fair Procedures: A Study of Administrative Procedures* (Clarendon Press, Oxford, 1996) at 275-279 for a more detailed discussion concerning the use of negotiation as a form of fair procedure.

[323] See Ch III, s A. See also Jaeckal, above n 80.

[324] *Port Louis Corporation v Attorney-General of Mauritius* [1965] AC 1111 at 1124, Per Lord Morris of Borth-y-Gest.

[325] *Te Heu Heu v Attorney-General* [1999] NZLR (HC) at 127.

[326] *Port Louis Corporation v Attorney-General of Mauritius*, above n 324, at 1124.

[327] *Wellington International Airport Ltd v Air New Zealand* [1998] 1 NZLR 671 at 672.

[328] *Port Louis Corporation v Attorney-General of Mauritius*, above n 324, at 1124.

[329] At 1124.

[330] At 1124.

working plan already in mind prior to the consultation, it should keep its mind open and be ready to change and even start afresh after hearing what the other party has to say.[331]

Under the future exploitation contracts, the advantage of a consultation process lies in providing a more effective balance between regulatory flexibility on the one hand, and fairness to the contractor on the other. By requiring the ISA to go into any consultation with their mind open, the contractor could influence the substantive outcome of the decision. On the other hand, a consultation process does not limit the ISA's ability to implement the changes to mining activities it believes to be necessary. Although consultation may not give contractors the investment certainty they perhaps desire, it ensures the contractor be involved in decisions made under an AM approach whilst ensuring the power to control mining activities throughout the term of the exploitation contract remains with the ISA.

2 Providing Written Reasons

Another way of ensuring transparency and fairness for the contractor is a formal requirement the decision-maker provide written reasons for any decision made under AM.[332] Presenting written reasons for any decision made under an AM approach will give contractors more confidence the decision was properly thought out.[333] Stakeholders will be able to see how their view was taken into account by the decision-maker and what arguments were given the most weight. As such, the provision of written reasons outlining their decision will help to ensure the ISA acts reasonably under AM, acting as a check on the ISA's discretion and adding to the legitimacy of the ISA's decision-making power under the contract.[334]

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[331] At 1124.

[332] Benidickson and others, above n 280, at F-21.

[333] Flick, above n 320, at 41.

[334] At 41.

D Public Participation

When boiled down to its core, public participation arguably forms two important purposes for environmental decision-making:[335]

1. Improving the quality of the decision; and
2. Improving the legitimacy of the decision.

Public participation has been argued to be of increased importance in AM.[336] Uncertainty means decisions are being made despite experts often being unsure of the potential environmental outcome. Being precautionary and adaptive requires decision-makers, in addition to identifying and assessing risk, to take into consideration the wider public's concerns and viewpoints on risk and the acceptability of harm in the environment.[337] In addition, public participation is of particular relevance for the ISA as it is required to act on behalf of humankind.[338]Allowing public participation in decision-making may assist in balancing the potentially competing interests of mining operators, the wider public, states and regulators.[339]

[335] Thomas Dietz and Paul Stern *Public Participation in Environmental Assessment and Decision Making* (National Academies Press; Washington D.C., 2008) at 44. See also DC Esty: "Good governance at the supranational scale: globalizing administrative law" (2006) 115 Yale L J 1490 at 1520, where it is stated that the incorporation of public dialogue in the process of decision-making ("deliberative legitimacy") is in an important factor in ensuring the legitimacy of decisions made by a public body.

[336] Benidickson and others, above n 280, at F-16.

[337]Joyeeta Gupta "Glocalization: The Precautionary Principle and Public Participation" in David Freestone and Ellen Hey (eds), *The Precautionary Principle and International Law: the Challenge of Implementation* (Kluwer Law International, 1996) 231 at 246; Benidickson and others, above n 280, at F-16.

[338] See Ch 1, s B.

[339]Jacqueline Peel, *The Precautionary Principle in Practice: Environmental Decision-Making and Scientifi c Uncertainty* (Federation Press, 2005) 156-157; Jaeckal, above 54, at 2.

What is required for good public participation will vary with the purpose the participation process is intended to serve.[340] Therefore, how public participation should fit under an AM framework may be different from how public participation fits under other aspects of the exploitation regime. AM presents a unique set of challenges for incorporating public participation which are not present in other forms of decision-making. For example, AM may require certain decisions be made with relative speed to prevent serious harm to the environment.[341] In addition, as decisions will often be based on the results of environmental monitoring, they are likely to be technical in nature. Finally, under the exploitation contracts, any public participation will need to be balanced with maintaining stability and predictability for the contractor as far as possible.

Craig and others argue the best way to balance the importance of public participation in the decision-making process with the flexibility required by AM is to decide *when* the public gets to participate in the decision-making process.[342] The creation of the Environment Plans and the period of time prior to the LTC concluding a contractor's Plan of Work present ideal opportunities to incorporate public participation into the decision-making process under the exploitation contracts.[343] Another opportunity, which would allow participation to occur throughout the life of an exploitation contract, albeit indirectly, would be to create a conservation objective as suggested by Jaeckal.[344] The creation of a conservation objective would require public input into a discussion concerning the level of environmental harm acceptable in the Area. The conservation objective could then be used by the LTC when responding to situations of scientific uncertainty under the AM framework and assist in determining whether the harm of a

[340] Dietz and Stern, above n 335, at 43.

[341] See Craig and Ruhl, above n 10, at 38.

[342] Robin Craig, and others "A proposal for amending administrative law to facilitate adaptive management" (2017) 12 Environ Res Lett 1 at 9

[343] See Draft Exploitation Regulations, draft reg 11, which provides that the Secretary-General will place the Environmental Impact Statement, the Environmental Management and Monitoring Plan and the Closure Plan on the Authority's website for a period of 60 days, providing members of the Authority and Stakeholders the ability to submit comments in writing on the above documents.

[344] Jaeckal, above n 54, above n x, at 2.

project reaches an unacceptable level as part of the risk management process.[345] Such a process would allow for the public good to be taken into account when making decisions under the AM framework, without the impact a requirement for notice and invitation for public comment could have on contractor certainty and regulatory flexibility under the AM decision-making process.

What is not so clear is whether direct public participation should occur in AM decisions made after an exploitation contract has been granted. AM decisions will generally be based on the results of monitoring and reporting or concerned with new technological and/or scientific developments. The question may be raised as to whether the wider public has the knowledge and expertise to add to the quality of the decision being made under an AM framework. Allowing for public participation after the exploitation contract has been granted may create additional uncertainty for the Contractor. In addition, the time taken to allow for public participation in the decision-making process may reduce flexibility for the regulator. As noted by Craig and others., "A truly iterative 'leaning by doing' may at some point run afoul of… the demands of public notice and comment."[346] Therefore, public participation in the AM process once the contract has been granted may prove to create additional barriers to the effective implementation of AM without any corresponding improvement in the quality of decision made.

However, it is possible that marine scientists, or people from similarly qualified backgrounds, may have knowledge which could contribute to the quality of decisions made under AM. One option would be to limit participation under AM to marine scientists, or similarly qualified experts, who could perform a type of peer review function by analysing and commenting on the environmental monitoring data. Such a process could enhance the quality of decisions made by the ISA under an AM framework,

[345] At 3.

[346] Craig and others, above n 342, at 9.

without significantly impinging on the flexibility of the decision-making process or certainty for the contractor.[347]

E Transparency

Transparency and the availability of monitoring data from mining activities is a complex issue that the ISA will need to consider carefully before the exploitation regulations are enacted.[348] Ardron argues the combination of the ISA's legal obligations to the Area and the biophysical conditions specific to the deep-sea environment suggest ensuring transparency is of heightened importance in the management of mining activities in the Area.[349] Further, Annex III, Article 14, states environmental and safety-related data shall not be considered proprietary. Ensuring environmental data collected from mining operations is made available to the wider public is important to ensure the ISA remain accountable and perform their regulatory role competently on behalf of humankind.[350] Further, the public availability of mining data is of increased importance if the wider public is locked out of participating in the decision-making process under an AM approach.[351] However, the ISA will need to balance the availability of monitoring data from mining operations with the confidentiality obligations owed to contractors.

The ISA is making a concerted effort to increase transparency in data and information availability in relation to the activities undertaken under the exploitation contracts.[352] The Draft Exploitation Regulations propose to incorporate a presumption of public

[347] For a more detailed analysis of the role of peer reviews in the scientific context, see Jacalyn Kelly, Tara Sadeghieh and Khosrow Adeli "Peer Review in Scientific Publications: Benefits, Critiques, & A Survival Guide" (2014) 25(3) eJIFCC 227.

[348] See generally Ruhl, above n 7, at 55;

[349] JA Ardron "Transparency in the operations of the International Seabed Authority" (2018) 95 Mar Pol at 324 at 328.

[350] At 328; Jeff Ardron; Henry Ruhl and Daniel Jones "Incorporating transparency into the governance of deep-seabed mining in the Area beyond national jurisdiction" (2018) 89 Mar Pol 58 at 58.

[351] See Ruhl, above n 179, at 55; Ruhl, above n 115, at 405.

[352] Legal and Technical Commission, above n 12, at para 22.

availability of data and information in relation to exploitation activities being made to the public.[353] Exceptions for classes of commercial activities can then be carved out of this general presumption.[354] The draft regulations also provide for the Secretary-General to make public performance assessments of the Environmental Management and Monitoring Plan,[355] and for the public availability of the findings and recommendations under the Secretary-General's review of the Plan of Activities.[356]

F Review

Risk management decisions made by the ISA under an AM approach will in many cases necessarily involve the use of discretion. The power to review discretionary decisions by an administrative body is an important process in minimising the risk of abuse of discretionary power.[357] The purpose of a review is to scrutinise an original decision to see whether it was properly made.[358] However, Article 189 of the Convention does not allow the Chamber to review any exercise of discretion by the ISA.[359]

What the Chamber can review are disputes concerning the interpretation or application of a contract[360] and acts of a party to the contract directed at the other party or directly affecting its legitimate interests.[361] In addition, the Chamber can review any action taken by the ISA which is alleged to be in excess of jurisdiction or a misuse of power.[362] Therefore the main purpose of judicial review in an AM context would be in ensuring the

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[353] Draft Exploitation Regulations, draft reg 87.

[354] See Legal and Technical Commission, above n 12, at para 26.

[355] Draft Exploitation Regulations, draft reg 50.

[356] Draft reg 56.

[357] Galligan, above n 322, at 395.

[358] At 395.

[359] UNCLOS, art 189. See also Ch 1, s D(3).

[360] UNCLOS, art 187(c)(i).

[361] Art 187(c)(ii).

[362] Art 187(b)(ii).

ISA follows the correct procedure laid down in the contract when making decisions under an AM framework.

Although the Chamber does not have the jurisdiction to review an exercise of discretion by the ISA, there remain other available alternatives to enable a review of a decision made under an AM framework to ensure fairness for the contractors. For example, if the LTC was to be the body responsible for making decisions under the contract,[363] there could be a process enabling appeals to be heard in the Council. Although the Council would not provide the level of independence and impartiality provided by the Chamber, they are a more accountable and representative body than the LTC.[364] As stated in section A above, it may be prudent to allow the Council to have the final say on certain decisions under AM regardless.

However, it should be remembered that, at its core, AM is an iterative process which requires the regulator to have significant flexibility to make decisions.[365] Allowing for every decision to be reviewed by the Council or another body could limit this flexibility and may discourage the original decision-maker from having to make potentially tough decisions balancing the integrity of the marine environment, the concerns of humankind as a whole and the significant financial investment from the contractor.[366] As stated above, arguably it is the LTC which is best-placed to consider the technical information within a wider values framework.

G Summary

Many of the principles touched upon in this Chapter can be thought of as sitting on a spectrum, with maximum regulatory flexibility at one end and maximum certainty for the

[363] See Ch IV, s A.

[364] See Ch I, s C.

[365] See Ch II, s C(4).

[366]See Ruhl, above n 10; Craig and Ruhl above n 10, for a more in-depth discussion of the role of judicial review in adaptive management.

contractor at the other. The principle of AM can provide significant added value to the exploitation regime and an additional tool for the ISA to manage and protect the CHM. The move to the exploitation phase heralds a significant new phase in the seabed mining regime. Therefore, it is imperative the ISA puts serious consideration how adaptive management can be incorporated into future exploitation contracts in a way which provides an adequate level of certainty and fairness for the contractor while ensuring the ISA has the regulatory flexibility to adapt management practices in response to new knowledge.

Conclusion

Adaptive management can provide the ISA with a tool to balance the competing goals which are contained in the future exploitation regimes. It provides an approach designed to reduce the complex risk and uncertainty inherent in deep seabed mining operations. To be successful, AM requires adherence to a structured scientific and legal process.[367] In the legal sense, it requires a flexible, yet structured, procedure which allows for the ISA to adjust mining operations when the activity is having a harmful effect on the marine environment.[368]

The exploration regulations do not provide the ISA with the procedures necessary implement an AM approach.[369] This dissertation hypothesised whether this is due to underlying contract and property law ideologies taking precedence under the exploration contracts and resulting in a prioritisation of a contractor's security of tenure at the expense of administrative flexibility. It argued that he nature of the ISA's role under the Convention lends support to an argument the relationship between the ISA and the contractor should be governed under public law principles. As such, the ISA should have the administrative flexibility to make substantive risk management decisions under an AM approach in the exploitation contract. Such flexibility can be legitimised through the creation of a structured decision-making process which is set out in the contract. The decision-making process could allow for the views of the ISA, the contractor and the wider public to be taken into account. The nuances of AM in practice also need to be considered when designing a decision-making process. The scientific, technical, economic and legal expertise of the LTC means this body would be the ideal decision-maker under an adaptive management approach.

[367] Craig and Ruhl, above n 10, at 15.

[368] See Ch II, s C(4).

[369] Jaeckal, above n 9, at 209.

Ultimately, it will be up to the ISA, in consultation with stakeholders and the wider public, to determine how the exploitation regulations can balance certainty and flexibility. Not touched upon in this dissertation is what impact a requirement that decisions be based off the "Best Available Scientific Evidence" could have on the risk management process under the precautionary principle and adaptive management. This could be a possible future area of research, made particularly relevant by the fact there remains little scientific knowledge of many aspects of the deep-sea environment.

Appendix

Article 145

Protection of the marine environment

Necessary measures shall be taken in accordance with this Convention with respect to activities in the Area to ensure effective protection for the marine environment from harmful effects which may arise from such activities. To this end the Authority shall adopt appropriate rules, regulations and procedures for inter alia:

(a) the prevention, reduction and control of pollution and other hazards to the marine environment, including the coastline, and of interference with the ecological balance of the marine environment, particular attention being paid to the need for protection from harmful effects of such activities as drilling, dredging, excavation, disposal of waste, construction and operation or maintenance of installations, pipelines and other devices related to such activities;

(b) the protection and conservation of the natural resources of the Area and the prevention of damage to the flora and fauna of the marine environment.

Article 153

System of exploration and exploitation

1. Activities in the Area shall be organized, carried out and controlled by the Authority on behalf of mankind as a whole in accordance with this article as well as other relevant provisions of this Part and the relevant Annexes, and the rules, regulations and procedures of the Authority.

2. Activities in the Area shall be carried out as prescribed in paragraph 3:

(a) by the Enterprise, and

(b) in association with the Authority by States Parties, or state enterprises or 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,

or any 79 group of the foregoing which meets the requirements provided in this Part and in Annex III.

3. Activities in the Area shall be carried out in accordance with a formal written plan of work drawn up in accordance with Annex III and approved by the Council after review by the Legal and Technical Commission. In the case of activities in the Area carried out as authorized by the Authority by the entities specified in paragraph 2(b), the plan of work shall, in accordance with Annex III, article 3, be in the form of a contract. Such contracts may provide for joint arrangements in accordance with Annex III, article 11.

4. The Authority shall exercise such control over activities in the Area as is necessary for the purpose of securing compliance with the relevant provisions of this Part and the Annexes relating thereto, and the rules, regulations and procedures of the Authority, and the plans of work approved in accordance with paragraph 3. States Parties shall assist the Authority by taking all measures necessary to ensure such compliance in accordance with article 139.

5. The Authority shall have the right to take at any time any measures provided for under this Part to ensure compliance with its provisions and the exercise of the functions of control and regulation assigned to it thereunder or under any contract. The Authority shall have the right to inspect all installations in the Area used in connection with activities in the Area.

6. A contract under paragraph 3 shall provide for security of tenure. Accordingly, the contract shall not be revised, suspended or terminated except in accordance with Annex III, articles 18 and 19.

SUBSECTION B. THE ASSEMBLY

Article 159

Composition, procedure and voting

1. The Assembly shall consist of all the members of the Authority. Each member shall have one representative in the Assembly, who may be accompanied by alternates and advisers.

2. The Assembly shall meet in regular annual sessions and in such special sessions as may be decided by the Assembly, or convened by the Secretary-General at the request of the Council or of a majority of the members of the Authority.

3. Sessions shall take place at the seat of the Authority unless otherwise decided by the Assembly.

4. The Assembly shall adopt its rules of procedure. At the beginning of each regular session, it shall elect its President and such other officers as may be required. They shall hold office until a new President and other officers are elected at the next regular session.

5. A majority of the members of the Assembly shall constitute a quorum.

6. Each member of the Assembly shall have one vote.

7. Decisions on questions of procedure, including decisions to convene special sessions of the Assembly, shall be taken by a majority of the members present and voting.

8. Decisions on questions of substance shall be taken by a two-thirds majority of the members present and voting, provided that such majority includes a majority of the members participating in the session. When the issue arises as to whether a question is one of substance or not, that question shall be treated as one of substance unless otherwise decided by the Assembly by the majority required for decisions on questions of substance.

9. When a question of substance comes up for voting for the first time, the President may, and shall, if requested by at least one fifth of the members of the Assembly, defer the issue of taking a vote on that question for a period not exceeding five calendar days. This rule may be applied only once to any question, and shall not be applied so as to defer the question beyond the end of the session.

10. Upon a written request addressed to the President and sponsored by at least one fourth of the members of the Authority for an advisory opinion on the conformity with this Convention of a proposal before the Assembly on any matter, the Assembly shall request the Seabed Disputes Chamber of the International Tribunal for the Law of the Sea to give an advisory opinion thereon and shall defer voting on that proposal pending receipt of the advisory opinion by the Chamber. If the advisory opinion is not received before the final week of the session in which it is requested, the Assembly shall decide when it will meet to vote upon the deferred proposal.

Article 160

Powers and functions

1. The Assembly, as the sole organ of the Authority consisting of all the members, shall be considered the supreme organ of the Authority to which the other principal organs shall be accountable as specifically provided for in this Convention. The Assembly shall have the power to establish general 83 policies in conformity with the relevant provisions of this Convention on any question or matter within the competence of the Authority. 2. In addition, the powers and functions of the Assembly shall be:

(a) to elect the members of the Council in accordance with article 161;

(b) to elect the Secretary-General from among the candidates proposed by the Council; (c) to elect, upon the recommendation of the Council, the members of the Governing Board of the Enterprise and the Director-General of the Enterprise;

(d) to establish such subsidiary organs as it finds necessary for the exercise of its functions in accordance with this Part. In the composition of these subsidiary organs due account shall be taken of the principle of equitable geographical distribution and of special interests and the need for members qualified and competent in the relevant technical questions dealt with by such organs;

(e) to assess the contributions of members to the administrative budget of the Authority in accordance with an agreed scale of assessment based upon the scale used for the regular budget of the United Nations until the Authority shall have sufficient income from other sources to meet its administrative expenses;

(f)

(i) to consider and approve, upon the recommendation of the Council, the rules, regulations and procedures on the equitable sharing of financial and other economic benefits derived from activities in the Area and the payments and contributions made pursuant to article 82, taking into particular consideration the interests and needs of developing States and peoples who have not attained full independence or other self-governing status. If the Assembly does not approve the recommendations of the

Council, the Assembly shall return them to the Council for reconsideration in the light of the views expressed by the Assembly;

(ii) to consider and approve the rules, regulations and procedures of the Authority, and any amendments thereto, provisionally adopted by the Council pursuant to article 162, paragraph 2 (o)(ii). These rules, regulations and procedures shall relate to prospecting, exploration and exploitation in the Area, the financial management and internal administration of the Authority, and, upon the recommendation of the Governing Board of the Enterprise, to the transfer of funds from the Enterprise to the Authority;

(g) to decide upon the equitable sharing of financial and other economic benefits derived from activities in the Area, consistent with this Convention and the rules, regulations and procedures of the Authority;

(h) to consider and approve the proposed annual budget of the Authority submitted by the Council;

(i) to examine periodic reports from the Council and from the Enterprise and special reports requested from the Council or any other organ of the Authority;

(j) to initiate studies and make recommendations for the purpose of promoting international cooperation concerning activities in the Area and encouraging the progressive development of international law relating thereto and its codification;

(k) to consider problems of a general nature in connection with activities in the Area arising in particular for developing States, as well as those problems for States in connection with activities in the Area that are due to their geographical location, particularly for land-locked and geographically disadvantaged States;

(l) to establish, upon the recommendation of the Council, on the basis of advice from the Economic Planning Commission, a system of compensation or other measures of economic adjustment assistance as provided in article 151, paragraph 10;

(m) to suspend the exercise of rights and privileges of membership pursuant to article 185;

(n) to discuss any question or matter within the competence of the Authority and to decide as to which organ of the Authority shall deal with any such question or matter not

specifically entrusted to a particular organ, consistent with the distribution of powers and functions among the organs of the Authority.

SUBSECTION C. THE COUNCIL

Article 161 Composition, procedure and voting

1. The Council shall consist of 36 members of the Authority elected by the Assembly in the following order:

(a) four members from among those States Parties which, during the last five years for which statistics are available, have either consumed more than 2 per cent of total world consumption or have had net imports of more than 2 per cent of total world imports of the commodities produced from the categories of minerals to be derived from the Area, and in any case one State from the Eastern European (Socialist) region, as well as the largest consumer;

(b) four members from among the eight States Parties which have the largest investments in preparation for and in the conduct of activities in the Area, either directly or through their nationals, including at least one State from the Eastern European (Socialist) region;

(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, States which are major importers of the categories of minerals 85 to be derived from the Area, States which are potential producers of such minerals, and least developed States;

(e) eighteen members elected according to the principle of ensuring an equitable geographical distribution of seats in the Council as a whole, provided that each geographical region shall have at least one member elected under this

subparagraph. For this purpose, the geographical regions shall be Africa, Asia, Eastern European (Socialist), Latin America and Western European and Others.

2. In electing the members of the Council in accordance with paragraph 1, the Assembly shall ensure that:

(a) land-locked and geographically disadvantaged States are represented to a degree which is reasonably proportionate to their representation in the Assembly;

(b) coastal States, especially developing States, which do not qualify under paragraph 1(a), (b), (c) or (d) are represented to a degree which is reasonably proportionate to their representation in the Assembly;

(c) each group of States Parties to be represented on the Council is represented by those members, if any, which are nominated by that group.

3. Elections shall take place at regular sessions of the Assembly. Each member of the Council shall be elected for four years. At the first election, however, the term of one half of the members of each group referred to in paragraph l shall be two years.

4. Members of the Council shall be eligible for re-election, but due regard should be paid to the desirability of rotation of membership.

5. The Council shall function at the seat of the Authority, and shall meet as often as the business of the Authority may require, but not less than three times a year.

6. A majority of the members of the Council shall constitute a quorum.

7. Each member of the Council shall have one vote.

8.

(a) Decisions on questions of procedure shall be taken by a majority of the members present and voting.

(b) Decisions on questions of substance arising under the following provisions shall be taken by a two-thirds majority of the members present and voting, provided that such majority includes a majority of the members of the Council: article 162, paragraph 2, subparagraphs (f); (g); (h); (i); (n); (p); (v); article 191.

(c) Decisions on questions of substance arising under the following provisions shall be taken by a three-fourths majority of the members present and voting, provided that such majority includes a majority of the members of the Council: article 162, paragraph 1; article 162, paragraph 2, subparagraphs (a); (b); (c); (d);

(e); (l); (q); (r); (s); (t); (u) in cases of non-compliance by a contractor or a sponsor; (w) provided that orders issued thereunder may be binding for not more than 30 days unless confirmed by a decision taken in accordance with subparagraph (d); article 162, paragraph 2, subparagraphs (x); (y); (z); article 163, paragraph 2; article 174, paragraph 3; Annex IV, article 11.

(d) Decisions on questions of substance arising under the following provisions shall be taken by consensus: article 162, paragraph 2(m) and (o); adoption of amendments to Part XI.

(e) For the purposes of subparagraphs (d), (f) and (g), "consensus" means the absence of any formal objection. Within 14 days of the submission of a proposal to the Council, the President of the Council shall determine whether there would be a formal objection to the adoption of the proposal. If the President determines that there would be such an objection, the President shall establish and convene, within three days following such determination, a conciliation committee consisting of not more than nine members of the Council, with the President as chairman, for the purpose of reconciling the differences and producing a proposal which can be adopted by consensus. The committee shall work expeditiously and report to the Council within 14 days following its establishment. If the committee is unable to recommend a proposal which can be adopted by consensus, it shall set out in its report the grounds on which the proposal is being opposed.

(f) Decisions on questions not listed above which the Council is authorized to take by the rules, regulations and procedures of the Authority or otherwise shall be taken pursuant to the subparagraphs of this paragraph specified in the rules, regulations and procedures or, if not specified therein, then pursuant to the subparagraph determined by the Council if possible in advance, by consensus.

(g) When the issue arises as to whether a question is within subparagraph (a), (b), (c) or (d), the question shall be treated as being within the subparagraph requiring the higher or highest majority or consensus as the case may be, unless otherwise decided by the Council by the said majority or by consensus.

9. The Council shall establish a procedure whereby a member of the Authority not represented on the Council may send a representative to attend a meeting of the Council

when a request is made by such member, or a matter particularly affecting it is under consideration. Such a representative shall be entitled to participate in the deliberations but not to vote.

Article 162

Powers and functions

1. The Council is the executive organ of the Authority. The Council shall have the power to establish, in conformity with this Convention and the general policies established by the Assembly, the specific policies to be pursued by the Authority on any question or matter within the competence of the Authority.

2. In addition, the Council shall:

(a) supervise and coordinate the implementation of the provisions of this Part on all questions and matters within the competence of the Authority and invite the attention of the Assembly to cases of non-compliance;

(b) propose to the Assembly a list of candidates for the election of the Secretary-General; 87

(c) recommend to the Assembly candidates for the election of the members of the Governing Board of the Enterprise and the Director-General of the Enterprise;

(d) establish, as appropriate, and with due regard to economy and efficiency, such subsidiary organs as it finds necessary for the exercise of its functions in accordance with this Part. In the composition of subsidiary organs, emphasis shall be placed on the need for members qualified and competent in relevant technical matters dealt with by those organs provided that due account shall be taken of the principle of equitable geographical distribution and of special interests;

(e) adopt its rules of procedure including the method of selecting its president;

(f) enter into agreements with the United Nations or other international organizations on behalf of the Authority and within its competence, subject to approval by the Assembly;

(g) consider the reports of the Enterprise and transmit them to the Assembly with its recommendations;

(h) present to the Assembly annual reports and such special reports as the Assembly may request;

(i) issue directives to the Enterprise in accordance with article 170;

(j) approve plans of work in accordance with Annex III, article 6. The Council shall act upon each plan of work within 60 days of its submission by the Legal and Technical Commission at a session of the Council in accordance with the following procedures:

(i) if the Commission recommends the approval of a plan of work, it shall be deemed to have been approved by the Council if no member of the Council submits in writing to the President within 14 days a specific objection alleging non-compliance with the requirements of Annex III, article 6. If there is an objection, the conciliation procedure set forth in article 161, paragraph 8(e), shall apply. If, at the end of the conciliation procedure, the objection is still maintained, the plan of work shall be deemed to have been approved by the Council unless the Council disapproves it by consensus among its members excluding any State or States making the application or sponsoring the applicant;

(ii) if the Commission recommends the disapproval of a plan of work or does not make a recommendation, the Council may approve the plan of work by a three-fourths majority of the members present and voting, provided that such majority includes a majority of the members participating in the session;

(k) approve plans of work submitted by the Enterprise in accordance with Annex IV, article 12, applying, mutatis mutandis, the procedures set forth in subparagraph (j);

(l) exercise control over activities in the Area in accordance with article 153, paragraph 4, and the rules, regulations and procedures of the Authority;

(m) take, upon the recommendation of the Economic Planning Commission, necessary and appropriate measures in accordance 88 with article 150, subparagraph (h), to provide protection from the adverse economic effects specified therein;

(n) make recommendations to the Assembly, on the basis of advice from the Economic Planning Commission, for a system of compensation or other measures of economic adjustment assistance as provided in article 151, paragraph 10;

(o)

(i) recommend to the Assembly rules, regulations and procedures on the equitable sharing of financial and other economic benefits derived from activities in the Area and the payments and contributions made pursuant to article 82, taking into particular consideration the interests and needs of the developing States and peoples who have not attained full independence or other self-governing status;

(ii) adopt and apply provisionally, pending approval by the Assembly, the rules, regulations and procedures of the Authority, and any amendments thereto, taking into account the recommendations of the Legal and Technical Commission or other subordinate organ concerned. These rules, regulations and procedures shall relate to prospecting, exploration and exploitation in the Area and the financial management and internal administration of the Authority. Priority shall be given to the adoption of rules, regulations and procedures for the exploration for and exploitation of polymetallic nodules. Rules, regulations and procedures for the exploration for and exploitation of any resource other than polymetallic nodules shall be adopted within three years from the date of a request to the Authority by any of its members to adopt such rules, regulations and procedures in respect of such resource. All rules, regulations and procedures shall remain in effect on a provisional basis until approved by the Assembly or until amended by the Council in the light of any views expressed by the Assembly;

(p) review the collection of all payments to be made by or to the Authority in connection with operations pursuant to this Part;

(q) make the selection from among applicants for production authorizations pursuant to Annex III, article 7, where such selection is required by that provision;

(r) submit the proposed annual budget of the Authority to the Assembly for its approval;

(s) make recommendations to the Assembly concerning policies on any question or matter within the competence of the Authority;

(t) make recommendations to the Assembly concerning suspension of the exercise of the rights and privileges of membership pursuant to article 185;

(u) institute proceedings on behalf of the Authority before the Seabed Disputes Chamber in cases of non-compliance;

(v) notify the Assembly upon a decision by the Seabed Disputes Chamber in proceedings instituted under subparagraph

(u), and make any recommendations which it may find appropriate with respect to measures to be taken; 89

(w) issue emergency orders, 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;

(x) disapprove areas for exploitation by contractors or the Enterprise in cases where substantial evidence indicates the risk of serious harm to the marine environment;

(y) establish a subsidiary organ for the elaboration of draft financial rules, regulations and procedures relating to:

(i) financial management in accordance with articles 171 to 175; and

(ii) financial arrangements in accordance with Annex III, article 13 and article 17, paragraph 1(c);

(z) establish appropriate mechanisms for directing and supervising 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

Article 165

The Legal and Technical Commission

1. Members of the Legal and Technical Commission shall have appropriate qualifications such as those relevant to exploration for and exploitation and processing of mineral resources, oceanology, protection of the marine environment, or economic or legal matters relating to ocean mining and related fields of expertise. The Council shall endeavour to ensure that the membership of the Commission reflects all appropriate qualifications.
2. The Commission shall:

(a) make recommendations with regard to the exercise of the Authority's functions upon the request of the Council;

(b) review formal written plans of work for activities in the Area in accordance with article 153, paragraph 3, and submit appropriate recommendations to the Council. The Commission shall base its recommendations solely on the grounds stated in Annex III and shall report fully thereon to the Council;

(c) supervise, upon the request of the Council, activities in the Area, where appropriate, in consultation and collaboration with any entity carrying out such activities or State or States concerned and report to the Council;

(d) prepare assessments of the environmental implications of activities in the Area;

(e) make recommendations to the Council on the protection of the marine environment, taking into account the views of recognized experts in that field;

(f) formulate and submit to the Council the rules, regulations and procedures referred to in article 162, paragraph 2(o), taking into account all relevant factors including assessments of the environmental implications of activities in the Area;

(g) keep such rules, regulations and procedures under review and recommend to the Council from time to time such amendments thereto as it may deem necessary or desirable;

(h) make recommendations to the Council regarding the establishment of a monitoring programme to observe, measure, evaluate and analyse, by

recognized scientific methods, on a regular basis, the risks or effects of pollution of the marine environment resulting from activities in the Area, ensure that existing regulations are adequate and are complied with and coordinate the implementation of the monitoring programme approved by the Council;

(i) recommend to the Council that proceedings be instituted on behalf of the Authority before the Seabed Disputes Chamber, in accordance with this Part and the relevant Annexes taking into account particularly article 187;

(j) make recommendations to the Council with respect to measures to be taken, upon a decision by the Seabed Disputes Chamber in proceedings instituted in accordance with subparagraph (i);

(k) make recommendations to the Council to issue emergency orders, 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. Such 92 recommendations shall be taken up by the Council on a priority basis;

(l) make recommendations to the Council 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;

(m) make recommendations to the Council regarding the direction and supervision of a staff of inspectors who shall inspect activities in the Area to determine whether the provisions of 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;

(n) calculate the production ceiling and issue production authorizations on behalf of the Authority pursuant to article 151, paragraphs 2 to 7, following any necessary selection among applicants for production authorizations by the Council in accordance with Annex III, article 7.

3. The members of the Commission shall, upon request by any State Party or other party concerned, be accompanied by a representative of such State or other party concerned when carrying out their function of supervision and inspection.

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