

1981

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Recommended Citation

Dangler, Edward (1981) "An Ocean Miner's View of the Draft Convention," *NYLS Journal of International and Comparative Law*: Vol. 3 : Iss. 1 , Article 6.

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AN OCEAN MINER'S VIEW OF THE DRAFT CONVENTION

EDWARD DANGLER*

It was with much anticipation that I awaited receipt of Judge Oda's paper entitled *Sharing of Ocean Resources - Unresolved Issues in the Law of the Sea*.¹ As an oceanographic researcher who has personally been involved with the development of deep sea mining systems for over fifteen years, and as one who has been following the activities of the several United Nations Conference sessions on the Law of the Sea, which have been deeply engrossed in this very issue of sharing ocean resources, I was eagerly awaiting a new point of view or insight into what has proven to be the thorniest issue in the entire history of the treaty text negotiation.² Unfortunately, the paper devotes only some brief remarks to the entire set of issues surrounding the exploration and exploitation of deep seabed minerals in the Area,³ and only one or two veiled references to the impact these issues are having on both the progress of the Conference and the legal connotation of common heritage of mankind.⁴ The fact that, for the past three ses-

*Assistant to the Senior Vice-President, Ocean Minerals Company. These remarks do not reflect the position of the Ocean Minerals Company, its participating joint venture partners or their subsidiary organizations, individually or collectively. These comments reflect the author's personal observations and point of view with all the biases and prejudices one may acquire in the course of some 15 years of engineering development work on a project that has yet to see the turning of the first shovel of nodules. Further, if some of the comments seem to question the scope or depth of Judge Oda's lecture, it is only in relation to his lack of emphasis on the problems that deep seabed miners have with the draft treaty and should in no way be construed to question his intentions or knowledge of the legal aspects of the treaty text, which is undoubtedly outstanding in all respects.

1. Oda, *Sharing of Ocean Resources - Unresolved Issues in the Law of the Sea*, 3 N.Y.J. INT'L & COMP. L. 1 (1981).

2. See note 5 *infra*.

3. For the provisions for the exploitation of the sea, see Third United Nations Conference on the Law of the Sea: Draft Convention on the Law of the Sea, arts. 136-191, Annex III, Annex IV, U.N. Doc. A/Conf.62/L.78 (1981) [hereinafter cited as Draft Convention]. See also Comment, *UNCLOS III: The Remaining Obstacles to Consensus on the Deep Sea Mining Regime*, 16 TEXAS INT'L L.J. 79 (1981); Lee, *Deep Seabed Mining and Developing Countries*, 6 SYRACUSE J. INT'L L. & COM. 213 (1979).

4. Draft Convention, *supra* note 3, art. 136. The concept of the "common heritage of mankind," and its relation to the seabed, first gained prominence in 1967, after Ambassador Pardo of Malta requested that the General Assembly consider the seabed issue. The term "common heritage of mankind" caught the imagination of the developing countries who saw in the seabed a resource that could be used to benefit the entire world, not just the developed countries. See Pardo, *Whose is the Bed of the Sea?*, 62 PROC. AM. SOC'Y INT'L L. 216, 225-26 (1968). See also 1 T. KRONMILLER, *THE LAWFULNESS*

sions, the major effort of the Conference has been to find accommodation between the positions of the developed and developing countries regarding Part XI⁶ and the many statements, both official and informal, that may have been emanating from the Conference, stating that the only stumbling block to treaty signature has been resolution of the few remaining issues relating to exploration and exploitation of the mineral resources of the Area, seems to have been totally overlooked by Judge Oda.

The thrust of his paper in expounding the problem of defining common heritage of mankind, from a conceptual expression to one with a common understanding and appreciation for all the institutional and legal implications, is well appreciated and must certainly be considered in the overall scheme of providing a resource umbrella regime. By merely defining, however, even to the satisfaction of legal experts, the many issues of common heritage of mankind will not bring us any closer to developing such resources as may exist in the Area for the betterment of mankind, unless a universally acceptable treaty text, with appropriate checks and balances for the rights and duties of all

OF DEEP SEABED MINING 20-23 (1980); Gorove, *The Concept of "Common Heritage of Mankind": A Political, Moral or Legal Innovation?*, 9 SAN DIEGO L. REV. 390 (1972); Saffo, *The Common Heritage of Mankind: Has the General Assembly Created a Law To Govern Seabed Mining?*, 53 TULANE L. REV. 492 (1979).

5. The positions of the developed and developing countries in regard to seabed mining reflect the deep division in the world community. The developing nations view the "common heritage of mankind" as a mechanism for the transfer of economic, technological, and political power from the developed countries to the developing nations. This position embraces the *res communis* concept; meaning that the seabed is a resource of all people. This position was advanced by a resolution of the General Assembly declaring that seabed mining activities should cease, and that no claim to jurisdiction over the area would be recognized. "Moratorium Resolution" G.A. Res. 2574, 24 U.N. GAOR Supp. (No. 30) at 10, U.N. Doc. A/7630 (1969). The majority of developed nations abstained or opposed this resolution. In 1970, a Declaration of Principles Governing the Seabed and the Ocean Floor, and the Subsoil Thereof, Beyond the Limits of National Jurisdiction, G.A. Res. 2749, 25 U.N. GAOR Supp. (No. 28) at 24, U.N. Doc. A/8028 (1970), was passed declaring that the Area is the common heritage of mankind with its resources to be used for all mankind.

The developed countries, while agreeing in principle with the common heritage approach, have nonetheless disagreed with the way to achieve it. They perceive the seabed as being *res nullius*, belonging to no one. Consequently, any nation with the technological capacity to exploit it, may do so. The developed countries have a strategic need for the mineral resources, and have resisted a multinational approach to exploitation. As the developed countries felt pressure from the developing countries they began to pass domestic legislation regulating deep sea mining by their nationals. The Deep Seabed Hard Mineral Resources Act, Pub. L. No. 96-283, 94 Stat. 533 (1980) established interim regulations consistent with United States policy, that can be superseded by any forthcoming treaty. See Caron, *Municipal Legislation for Exploitation of the Deep Seabed*, 8 OCEAN DEV. & INT'L L. 259 (1980); see generally Collins, *Mineral Exploitation of the Seabed: Problems, Progress, and Alternatives*, 12 NAT. RESOURCES LAW. 599 (1979).

parties in the parallel system of resource access,⁶ is brought into being. The examples that Judge Oda has used to focus on the potential problems of common heritage of mankind are taken from the articles in the Draft Convention relative to the EEZ fishing provisions and to the protection of the marine environment. It is interesting to note that during the past two sessions of UNCLOS III, Committee II and Committee III, which deal respectively with the aforementioned issues, did not convene any negotiating sessions, nor provide revisions to the treaty text, on the basis that the work previously accomplished had, for better or worse, the best chances of obtaining consensus on these issues. Moreover, any further attempt to revise such provisions could only upset the delicate balance of the package deal. Committee I, on the other hand, which has the responsibility of formulating the text for the exploration and exploitation of the Area⁷ and the institutional aspects of control and administration of the Area through the Authority⁸ and its subordinate legislative⁹ and administrative¹⁰ organs, has been

6. The parallel system of resource access is a compromise proposal providing that after a mining site is explored and authorized by the International Seabed Authority, two mine sites will be developed, one by the state or private entity, and one by the Enterprise. This would ensure open access to mining sites by the developed countries, while at the same time reserving sites for future exploitation by the international Enterprise. Draft Convention, *supra* note 3, art. 153, Annex III, arts. 6,8,9. While this might seem to be a classic compromise, significant questions regarding production and technology transfer still exist. See Aldrich, *A System of Exploitation*, 6 SYRACUSE J. INT'L L. & COM. 245 (1979).

7. Draft Convention, *supra* note 3, art. 1(1). The "Area" is defined as the "seabed and ocean floor and subsoil thereof beyond the limits of national jurisdiction." *Id.* The Draft Convention provides that activities in the "Area" shall be carried out for the benefit of mankind. *Id.* art. 140.

8. Draft Convention, *supra* note 3, art. 157. The Authority is charged with organizing and controlling activities in the Area, "particularly with a view to administering the resources of the Area," *id.*, as well as encouraging prospecting in the Area. *Id.* Annex III, art. 2. The Authority will act as a collective body representing each of the member states, charged with governing mining activities in the Area. The Assembly and Council will perform legislative functions of the Authority and the Secretariat will be charged with performing administrative duties. Comment, *The Deep Seabed Hard Mineral Resources Act and the Third United Nations Conference on the Law of the Sea: Can the Conference Meet the Mandate Embodied in the Act?*, 18 SAN DIEGO L. REV. 509, 512 (1981).

9. Draft Convention, *supra* note 3, art. 160. The legislative functions of the Authority will be performed by an Assembly and a Council. The Assembly shall consist of a representative from each member state and will be charged with general policymaking tasks including the approval of budgets, assessments of members, and the selection of the Council and the Secretary General. *Id.* The Council shall perform executive functions for the Authority and will be charged with formulating recommendations for the Assembly. *Id.* art. 161.

Controversy remains regarding the distribution of legislative power among the two organs. The industrialized states seek to vest much of the Authority's discretionary power with the Council, on which they are strongly represented. Less developed coun-

in continual working sessions since the first treaty text appeared.

Judge Oda briefly bypasses the entire series of events and issues of the Reagan Administration review process with a statement that the

United States blocked UNCLOS III early this year, mainly because the Reagan Administration was not yet in a position to determine its own policy towards this particular problem. This reflects the dissatisfaction felt by the hard mineral industries in the United States, with the ways and means of exploitation suggested in the Draft Convention.¹¹

If I can shed some light upon this comment with an elaboration of the circumstances that led to the Reagan decision, and follow up with some statements from my own viewpoint as to where the industry sees problems, perhaps the issues raised by Judge Oda's paper will be more comprehensive than it currently suggests.

The Reagan Administration position as exemplified by its spokesman, Assistant Secretary J. Malone, Ambassador to UNCLOS, clearly stated that its review was not occasioned by pressures from the fledgling seabed mining industry, but by the simple fact that:

[W]e were informed that the Conference was on the verge of finalizing this text and that there was an expectation that the negotiations would conclude this year - 1981. Many of the provisions of the draft convention prompted substantial criticism from Congress, from industry and the American public. There was also some question of whether this draft convention was consistent with the stated goals of the Reagan Administration. Therefore, the Administration decided that it would be better to face criticism in the U.N. than to proceed prematurely to finalize a treaty that might fail to further our national interests.¹²

tries are seeking to establish the Assembly, where they have a numerical majority, as the supreme policymaking organ of the Authority. Comment, *supra* note 8, at 512. See also Goldberg, *The State of the Negotiations on the Law of the Sea*, 31 HASTINGS L. J. 1091 (1980); Comment, *UNCLOS III: The Remaining Obstacles to Consensus on the Deepsea Mining Regime*, 16 TEX. INT'L L. J. 79 (1981).

10. Draft Convention, *supra* note 3, art. 166. The chief administrative organ of the Authority shall be the Secretariat, which will be presided over by the Secretary-General. The Secretariat shall be charged with submitting an Annual Report to the Assembly and performing daily administrative tasks. *Id.* The Draft Convention envisions that the Secretariat will be composed of a staff of an international character. *Id.* art. 168.

11. Oda, *supra* note 1, at 10.

12. *United States Policy and the Third United Nations Conference on the Law of the Seas: Hearings Before the House Committee on Foreign Affairs*, 97th Cong., 1st Sess. 3 (April 29, 1981) (Statement of James Malone, Head of the United States Delegation to the Third United Nations Conference on Law of the Sea and Assistant Secretary-

Ambassador Malone went on to list several of the major issues in the text that raised questions concerning consistency with United States national interests. These include, among others, the burdensome international regulation the treaty places on the development of ocean resources,¹³ establishment of a supranational mining company, called the Enterprise, which would benefit from the significant discriminatory advantages relative to companies of industrialized countries,¹⁴ the mandatory transfer of technology¹⁵ now largely in United States hands, the production limitation aspects of the text, which could be used to deny contracts to qualified American companies,¹⁶ the one-nation, one-vote Assembly,¹⁷ a Council where the Soviet Union and its allies have three guaranteed seats but in which the United States must compete with its allies for representation,¹⁸ and the review conference procedure where, after fifteen years of production, provisions to the treaty can be amended by two-thirds of the treaty parties.¹⁹ Additional difficulties with the text provisions include the imposition of revenue sharing obligations, which would significantly increase costs,²⁰ the international revenue sharing obligations on production of hydrocarbons from the continental shelf beyond the 200-mile exclusive economic zone,²¹ provisions concerning liberation movements and their eligibility to share in revenues of the Authority,²² and the lack of provision for protecting investments made prior to entry into force of the Convention.²³

To the best of my knowledge, the review process has gone forward on a steady, albeit slow and methodical route, with inputs sought from all sectors of government, industry and the public. Furthermore, the Public Advisory Board to the United States Delegation to the Law of the Sea Conference has been consulted and briefed by the negotiation team of the delegation. It is my opinion that in spite of the delay that has occurred in the formalization of a treaty text, the ocean mining industry, which is not exclusively American owned, but, by any yardstick, international in scope, has welcomed the review as a means to clarify and improve deep seabed mining provisions. Our consortium consists of both United States and Dutch/British interests, while those

Designate of the Bureau of Oceans, Environment and Scientific Affairs).

13. *Id.*

14. *Id.*

15. *Id.* at 4.

16. *Id.*

17. *Id.*

18. *Id.*

19. *Id.*

20. *Id.*

21. *Id.* at 5.

22. *Id.*

23. *Id.*

of our American-based competitors consists of United States, Canadian, British, Belgian, West German, Italian and Japanese commercial interests. The Japanese, in fact, are strongly represented in two of the four United States based operations. In addition, there are government sponsored efforts in France and Japan to develop deep seabed mining systems. To my knowledge, all of the organizations involved in the technical development of this industry, either commercial interests based in the United States or government sponsored bodies, had problems in continuing the heavy investments necessary for further scale-up engineering in light of the existing treaty text provisions for exploration and exploitation of the seabed. It is my understanding that the review process is now reaching a conclusion, and a set of decision memoranda will be presented to the President. Based on the decisions of the President, the American delegation will then go forward to the Conference session in New York with a set of negotiation instructions and, I hope, we will begin to see a meaningful dialogue where all of the concerns, both of the developing and the developed industrial countries in deep seabed mining, can be accommodated.

As both a scientist and an industrialist, I should like to state that the development of the deep seabed mineral deposit represents one of the greatest challenges to ocean technology and could be the most extensive mineral resource the world has yet known. The deposit, however, will remain where it has been for the past several million years; under some four-thousand five-hundred meters of seawater, unless some legal regime is established that provides for the positive development of the industry. Unfortunately, the existing text does not provide the necessary incentives, given the current markets, state of technological development and the inherent risks, to go forward with the next steps to achieve commercialization. To advance from the completion of the preliminary research and development phase, where most of the consortia are at present, to commercial exploitation will require, as a minimum, a scale-up prototype phase which will represent some 250 million dollars of development funding. Following this prototype test phase will be commercial scale design, fabrication, testing and implementation, which, at conservative estimates, will require 1 to 1.5 billion dollars before the first revenues are seen. With such inordinately high front-end costs, the assurance of access to the resources under a fixed set of rules and regulations must be established.²⁴

24. Due to the large investment required for deep sea mining ventures, the industry demands security for its operations, as well as assurance that it will not be dispossessed by whatever future regime is established. Prior to ratification of an international regime, the industry insists on the inclusion in the Law of the Sea treaty of a grandfather clause, thereby protecting investments made under national legislation before adoption of the treaty. Young, *Inducement for Exploration by Companies*, 6 SYRACUSE J. INT'L L. &

Putting aside those areas of concern that Ambassador Malone has specified in his testimony and in subsequent interventions during sessions of the UNCLOS III negotiations, which could be termed purely of political substance, I believe that the existing ocean mining industrial interests must have several basic conditions met before they can continue with the next phase of investment. They can be briefly summarized in the following six areas of concern:

A. *Transitional Arrangements*

Pioneer operators must have guaranteed assurance that work done prior to entry into force of the Convention will be recognized under the terms of the Convention. To provide for this, a Preparatory Commission must be able to enter into contracts that will have binding force under the treaty.

B. *Production Limitation*

Regardless of how distasteful the concept of centralized planning and production allocation might be to companies from market economy countries, I believe some provisions can be made for those developing countries' land-based producers that are, in fact, adversely affected by sea-based mining, at least for some interim period.³⁵ The

COM. 199, 201-05 (1979).

An example of an interim regime promoting exploration and commercial recovery of seabed minerals is the United States Deep Seabed Hard Mineral Resources Act, Pub. L. No. 96-283, 94 Stat. 553 (1980). It provides for the transition to an international regime if the agreement provides assured and nondiscriminatory access to deep seabed resources for American citizens and security of tenure for miners who begin exploration or commercial recovery before the Law of the Sea treaty enters into force. See Pirtle, *Alternative Regimes for Harvesting the Seabed — A Review Article*, 9 OCEAN DEV. & INT'L L. 77, 88 (1981).

25. Existing and potential land-based producers of minerals that are also found in the seabed feel threatened by the possibility that non-competitive factors such as subsidy of ocean mining, tariffs and quotas on imports will disrupt the open international market in these minerals. In order to limit or reduce the possibility that such factors will interfere with market forces and constrict access to domestic markets, the land-based producers support production limitations on seabed minerals. Herman, *The Niceties of Nickel — Canada and the Production Ceiling Issue at the Law of the Sea Conference*, 6 SYRACUSE J. INT'L L. & COM. 265, 272-73 (1979).

Although the industrialized nations maintain that no adverse effects would result from seabed mining to the land-based producers, a United Nations study shows strong evidence to the contrary. It shows that by the year 2000, the respective percentages of the world demand for the following minerals would be supplied by seabed mining: manganese, 94%; nickel, 60%; cobalt, 15%; copper, 7%. Vicuna, *The Regime for the Exploration of the Seabed Mineral Resources and the Quest for a New International Economic Order of the Oceans: A Latin-American View*, 10 LAW. AMERICAS 774, 779 (1978) (citing J. P. Levy, *Importancia de los Recursos Minerales de los Fondos Marinos y Estado de la Tecnologia de la Minería en Aguas Profundas*, in ECONOMIA DE LOS OCEANOS

means to accomplish this, however, should not be through the dictates of a complicated allocation system, as the treaty text currently provides,²⁶ but should be handled on a case-by-case basis, in the form of appropriate compensation for those nations so affected.

C. *Security of Contract*

Contracts entered into by private companies on the commercial development side of the parallel system must be free of future changes and modifications to the exploitation, as may be imposed from treaty text amendments. The essential rights set out in contracts, that is, the areas of access, terms and conditions of exploration and exploitation, dispute settlement procedures, etc., must be excluded from any future modifications except through mutual negotiation of contract.²⁷

D. *Approval of Plans of Work*

The approval of a qualified applicant should be as automatic as possible. As the text now reads, the Technical and Legal Commission, a subordinate organ of the Authority, has the approval/disapproval authority of review that must be acted upon before the consensus provisions take effect.²⁸ While review by such Technical and Legal Commis-

123, Table 7 (U.N. Economic Commission for Latin America 1977)).

A recent United Nations Conference on Trade and Development study estimated that due to export seabed mining the income of developing copper producers would diminish by the year 2000 by more than two billion dollars. Vicuna, *supra* at 780 (citing B. MARTIN-CURTOUD, *CONSECUENCIAS ECONOMICAS DE LA EXPORTACION DE LOS RECURSOS MINERALES DE LOS OCEANOS* 144). In order to preserve their interests, land-based producers proposed three specific mechanisms for protection: (1) seabed production limits; (2) long term commodity agreements regulating the international market for minerals by stabilizing prices and ensuring adequate supplies; and (3) indemnification of land-based producers who suffer actual loss because of seabed production when preventative measures would not be effective. Vicuna, *supra* at 780-81.

26. Draft Convention, *supra* note 3, art. 151.

27. Although the treaty provides for security of tenure to contracts entered into with the Authority, *id.* art. 153(6), it also provides for the revision, suspension and termination of contracts in accordance with articles 18 and 19 of Annex III. The contractor's rights under the contract may be suspended or terminated only for "serious, persistent and wilful" breach of contract, violation of Part XI and of the rules and regulations of the Authority, *id.* Annex III, art. 18(a), or for failure to comply with a binding dispute settlement applicable to it. *Id.* Annex III, art. 18(b). Revision may occur only by the consent of the parties and when there has been a fundamental change of circumstances. *Id.* Annex III, art. 19.

28. All proposed activities in the Area must be submitted as a formal written plan to the Legal and Technical Commission for review. *Id.* art. 153(3). Article 165(2)(b) authorizes the Commission to review the written plan and make recommendations to the Council. *Id.* The Commission, like the Council must base its recommendations upon the standards established in Annex III, the principal requirement being the applicant's compliance with the rules and procedures of the Authority. *Id.* Annex III, art. 6(3). If the

sion is a necessary step in the overall award of contract processes, such review should be set by time constraints and unfavorable or untimely findings should be subject to commercial arbitration proceedings.

E. *Transfer of Technology*

One of the most disturbing concepts in the text to commercial investors is the need to supply their potential competitors with their proprietary data and innovative technology.²⁹ Given the political nature of the negotiations, however, I believe most investors would now realistically consider some technology transfer provisions as tantamount to contract award and as inevitable. The remaining problem, in the current text concerning this area, is centered upon the provisions of third-party technology obligations.³⁰ At most, the contractor should be obligated to use all reasonable efforts to assure the Enterprise that third-party technology suppliers will provide such technology under similar terms and conditions as supplied to the contractor. Furthermore, the definition of technology, as is currently in the text,³¹ is so encompassing as to make any application of reasonable transfer a legal morass. Under the general intent of similar technology transfer requirements in

Commission recommends approval of the plan of work, it shall be approved, unless the Council disapproves it by consensus. *Id.* art. 162(2)(j)(i). If disapproval is recommended, then only with a three-fourths majority may the Council approve it. *Id.* art. 162(2)(j)(ii). See generally Oxman, *The Third United Nations Conference on the Law of the Sea: The Ninth Session*, 75 AM. J. INT'L L. 211, 221 (1980).

29. The treaty provides that the technology employed by the operator in its mining activities of the Area shall be made available to the Enterprise, insofar as the operator is legally allowed and the Enterprise is unable to acquire the same or equally efficient technology on the open market at fair and reasonable terms. Draft Convention, *supra* note 3, Annex III, art. 5(3)(a). The transfer shall be accomplished by means of a license or other suitable arrangements arrived at through negotiations between the Enterprise and the operator. *Id.* See also Silverstein, *Proprietary Protection for Deepsea Mining Technology in Return for Technology Transfer: New Approach to the Seabeds Controversy*, 60 J. PAT. OFF. SOC'Y 135 (1978).

30. The operator must obtain written assurance from the owner of the equipment that the latter will, upon the request of the Authority, make available any technology used, yet not available on the open market. Draft Convention, *supra* note 3, Annex III, art. 5(3)(b). Failure to so obtain this assurance will result in a prohibition against using that technology in his mining operations. *Id.* Additionally, the operator is required to obtain the right to transfer the technology to the Enterprise, if it is possible for him to do so without incurring "substantial cost." *Id.* Annex III, art. 5(3)(c). When there is a "substantial corporate relationship" between the owner and operator, the influence one has over the other is considered when determining whether all feasible efforts had been made. Failure to then acquire the rights from the owner will be relevant when considering the operator's qualifications in later plans of work. *Id.*

31. *Id.* Annex III, art. 5(8):

For the purposes of this Article, "technology" means the specialized equipment and technical know-how, including manuals, designs, operating instructions, training and technical advice and assistance, necessary to assemble,

commercial practice, the Enterprise should be given the opportunity to obtain such software and specification from the applicant, but should not be authorized to require the contractor to obtain the hardware for them. The entire matter of transfer of technology should be limited to technology that is capable of being licensed, and furthermore, the licensor should in no way be required to provide guarantees other than those normally provided under an arms-length commercial arrangement.

F. Amendments

The concept of a review conference that can seriously alter both the scope and the intent of the original text presents a very real problem to natural resource developers who must look many years into the future in order to recover their initial investment and provide a reasonable return for their investors.³² Amendments should not be binding upon non-ratifying states and any new terms for contracts should be left for negotiation between the parties.

In summary, speaking both for myself and for many of the individuals who have been seriously working in the field of ocean resource development, I can say that a speedy conclusion to an international convention on the Law of the Sea that provides a positive atmosphere for investment is in the best interest of all. I further believe that until such time as the above concerns are addressed and some solutions developed through a mutual negotiation process, private capital will not be invested in ocean mineral development. For the moment, one finds that the movement to bring ocean mining to a commercial reality is at an impasse. There does not appear to be enough political stability and goodwill to allow prudent management to make commitments for some years to come. From a practical point of view, the minerals are perfectly safe under a blanket of some four to five thousand meters of salt water. They cannot be hijacked in any meaningful quantity. Although

maintain and operate a viable system and the legal right to use those items for that purpose on a non-exclusive basis.

Id.

32. Pursuant to article 155(1), the Assembly will convene a review conference fifteen years after commercial production under an approved plan of work has begun. This conference will evaluate the effectiveness of the Convention, "in light of the experience acquired during that period." *Id.* In particular, the review conference will consider the achievements of Part XI of the Convention in regulating the exploration and exploitation of resources, including "whether the system has resulted in the equitable sharing of benefits to be derived from activities in the Area." *Id.* Five years after the conference has been convened, amendments for "necessary and appropriate" changes may be submitted for ratification. *Id.* art. 155(4). If adopted by a two-thirds vote, the amendment will be effective in one year. *Id.* Any amendment so adopted will not affect pre-existing contract rights. *Id.* art. 155(5).

they could be extremely useful to the world's economy, other sources, some more costly, do exist. No one likes to reach a technically feasible solution to a resource problem and have its exploitation blocked by political considerations, but it has happened before, and we have survived. I can assure both Judge Oda and the readers, that ocean mining is a feasible operation and that it makes economic sense to proceed. Indeed, our standard of living will be seriously affected if we do not get to it by at least the turn of the century. I further believe that future generations will be glad that organizations such as mine have stuck with the project and were not dismayed by the obstacles that we encountered on the way.

