

MARINE TECHNOLOGY TRANSFER AND THE LAW OF THE SEA

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ABSTRACT

On 10 December 1982, a signing ceremony was held for the United Nations Convention on the Law of the Sea (UNCLOS) in Montego Bay, Jamaica. The comprehensive Law of the Sea Treaty was signed by delegates from 117 countries, and the document represented over nine years of difficult negotiations conducted by nearly 3,000 representatives and negotiators. The Treaty is a comprehensive effort to regulate the world's oceans, and includes provisions on a wide range of issues, including territorial seas, the continental shelf, the high seas, marine scientific research, exploitation of the deep seabed, straits passage (for commercial shipping and warships), fishing rights, and technology transfer. The accord creates several new international organizations, including mechanisms for regulation of deep seabed mining, dispute resolution, and other ocean affairs. The United States, along with several other major Western industrial countries, has indicated unwillingness to ratify the Treaty due to concerns over the deep seabed regime in general and the technology transfer sub-regime in particular. This dissertation focuses on two primary research questions. The first is: How important was the issue of marine technology transfer to the emerging ocean regime? The second is: In what way can the Treaty be improved or refined in order to improve the possibility

of full Western participation in the agreement?

The method of approach to the problem was to divide the contending actors into four major groups: The Western industrial powers, the developing countries, the international organizations, and the multinational corporations. Each of the four groups had a significant interest in the outcome of the overall negotiations and particular concerns over technology transfer. Research was then conducted by interviewing representative individuals from each of the four groups. The general analysis used was the Keohane-Nye model of complex interdependence, including an emphasis on the goals of actors, the linkage strategies and agenda formation techniques employed, the role of military force, the influence of international organizations, and the utilization of instruments of policy on the part of the various actors. Additionally, the techniques of regime analysis were used to focus both on the overall ocean regime and the specific sub-regime of technology transfer in the Treaty context. In the course of the dissertation, the history and background of the ocean regime, as well as a sweeping survey of current marine technology were also covered.

After interviewing over a hundred leading figures in the Law of the Sea area (including Elliot Richardson, Tommy T.B. Koh, Alan Beesley, James Malone, Paul Engo, Bernardo Zuleta, Elizabeth Mann Borgese, Bruce Harlow, Claiborne Pell, and many others), the conclusion emerged that the

marine technology transfer issue was indeed one of the major controversial questions in the Conference. Particularly as the decade of the 1970s drew to a close, the overall deep seabed mining questions and the specific controversy over mandatory transfer of mining technology became one of the most difficult issues to resolve. It was eventually specifically cited by President Ronald Reagan in the justifying the U.S. decision not to sign the accord. The dissertation discusses the positions of each of the four contending actors on the question of technology transfer in great depth.

The second major section of the dissertation attempts to synthesize and analyze the positions of each of the actor-groups. The arguments proposed by each side are considered, and specific recommendations are offered to provide at least a starting point in either renegotiation or refinement of the Treaty in order to bring about full Western participation. The major recommendations include:

- 1) Continue to utilize the United Nations as a forum for discussion and resolution of conflict.
- 2) Develop a specific Marine Patent System to help resolve the technology transfer controversy.
- 3) In conjunction with the Marine Patent System, establish an independent technology arbitration board to assist in resolving specific disagreements.
- 4) Set up a technology assessment board to define the value of each specific technology used in the oceans.
- 5) Use Western educational systems to further the

goals of marine technology transfer.

6) Introduce a system of regional research and development centers located in developing countries to further enhance the effect of marine technology transfer and allow the development of further technology in the developing world.

7) Create specific incentives to emphasize the importance of joint ventures as the most effective means of ensuring marine technology transfer.

The dissertation concludes by offering some possible scenarios and specific means to implement a solution to the overall problem. It is ultimately important to remember that all the actors share the overall goal of producing an equitable, viable regime for the oceans. The marine technology transfer controversy must be solved in a systematic fashion in order to produce such a regime. All sides of the debate must join in effective action to ensure that the emerging ocean regime is a useful instrument for the development of world order.

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I. INTRODUCTION

A. Statement of the General Problem

On December 10, 1982, the Third United Nations Law of the Sea Conference (UNCLOS III) concluded with 117 countries signing the resulting treaty in Montego Bay, Jamaica. The lengthy, complicated agreement represented the efforts of thousands of negotiators laboring for eleven sessions to produce a comprehensive ocean treaty. It was, as one expert observer described the 15 year process, "the largest and longest of all international conferences."¹ The Law of the Sea Treaty contains provisions detailing management systems for the territorial seas, contiguous zones, continental shelves, exclusive economic zones, high seas, and deep seabeds of the world's oceans. It also articulates a comprehensive framework for transit passage through critical

¹Elizabeth Mann Borgese, "The Law of the Sea," Scientific American, Volume 248, Number 3, March, 1983, p. 42.

straits for both commercial and military vessels. It develops guidelines for marine environmental protection, marine scientific research, archipelagic boundary limitation, dispute resolution, distant and coastal fishing,² and marine technology transfer.

The Treaty creates a major new global organization, the International Seabed Authority (ISA or Authority), which includes important sub-organizations---the Assembly (patterned on the U.N. General Assembly); the Council (an executive action group of 32 countries); the Enterprise (an independent mining concern); a large secretariat, a legal-technical commission, an economic planning commission, and the International Tribunal for the Law of the Sea (a judicial/dispute resolution body).³

The Treaty codifies much of the existing historical international sea law. It also goes well beyond the traditional "freedom of the high seas" regime and replaces much of that traditional laissez-faire system with a concept of global management based on the "common heritage principle." In essence, this system puts the resources of the ocean's deep seabed in a special category for

²Convention on the Law of the Sea and Resolution I-IV, Third United Nations Conference on the Law of the Sea (Washington, D.C.: Office of Ocean Law and Policy, Department of State, June, 1982). Hereafter, LOS.

³LOS, Part XI, pp. 60-97.

protection and allocation. Under the ISA and its mining arm, the Enterprise, the deep seabed will be developed so as to benefit all mankind, not merely the advanced states with the capability to mine it. They will accomplish this by a series of licensing and regulatory powers, including the right to mandate technology transfer.⁴

Overall, the Law of the Sea Treaty is the single most complex and ambitious attempt at the creation of a global regime undertaken by man. It seeks to place 42% of the world's surface (the deep seabed) directly under a negotiated system of international control. The Treaty also extends some form of international control and order to the entire world ocean, an area comprising over 71% of the earth. Its implications for world order and global wealth, as well as international power, politics, economics, and law are considerable.⁵

The United States of America, despite having been one of the chief instigators and supporters of the Treaty process since the long series of meetings began, refused to approve the final version of the UNCLOS III Treaty. This decision was announced by Ronald Reagan, after a one year review of

⁴LOS, Part XI, pp. 60-97.

⁵"Regime," which will be described in depth later, is used here as "sets of . . . principles, norms, rules, and decision-making procedures," as in Stephen Krasner, International Organizations, Volume 36, Number 2, Spring, 1982.

the Treaty, on March 15 1982. Although last-minute efforts were made by the Conference to modify the Treaty in accordance with the U.S. position on the document, the U.S. rejected the final form of the Treaty and was one of four countries (the others were Turkey, Israel, and Venezuela) to vote against its adoption on April 31, 1982. One of the primary concerns voiced by the administration was with the provisions for mandatory transfer of advanced deep seabed mining technology from industrial consortia of the West to the Enterprise and the developing world. As Ambassador James Malone, the U.S. Chief Delegate to the Eleventh and final sessions of the conference commented on 23 February 1982:⁶

"There is a deeply held view in our Congress that one of America's greatest assets is its capacity for innovation and invention and its ability to produce advanced technology. It is understandable, therefore, that a treaty would be unacceptable to many Americans if it required the United States or, more particularly, private companies to transfer that asset in a forced sale."

Various provisions of UNCLOS III mandate the transfer

⁶ Ambassador James M. Malone, Chief Delegate to the Eleventh Session of UNCLOS III, in testimony before the House Merchant Marine and Fisheries Committee on February 27, 1982, supplied by the Department of State to the author.

of technology to the Enterprise (and via them to developing countries) if the technologies are used to exploit the deep seabed. This mandatory transfer would occur only if the Enterprise was unable to obtain the technology on the open market and then at "fair and reasonable commercial terms and conditions." Most industry representatives believe, however, that it is essentially impossible to determine a fair market value for a unique deep seabed mining system, and view the mandatory technology transfer provisions as a form of "legalized theft," as one consortium executive described⁷ them.

To date, the U.S., West Germany, Belgium, the U.K., and Italy, among the major industrial powers, have declined to sign the convention, although only the U.S. (among the major industrial powers) actually voted against it in present form as the Convention ended. Each of the countries noted has a share of a major deep seabed mining consortia and has at least some control or interest in the advanced mining technology required to actually undertake deep seabed mining. While other Western powers (including France, Japan, and Canada) have signed the accord, the major dynamic

⁷ The mining executive involved requested confidentiality. His comment was echoed in tone by many of the other businessmen interviewed in the course of this research.

throughout the Conference was one of developing countries versus industrial powers. As such, the Law of the Sea Treaty represented an issue that may well emerge on the cutting edge of North-South relations during the next fifty years. The marine technology transfer issues in the Treaty are part of the overall international controversy surrounding the accord, with additional controversy supplied by the role of industrial companies (who hold the technology) and the international organizations that support its transfer (broadly speaking, the U.N. group). As a general problem, marine technology transfer in the Law of the Sea context is part of a much larger question mankind will have to face in the coming years---the distribution of the earth's wealth. The question is ultimately profoundly significant: Is there indeed a "common heritage of mankind?" Should there be a "common heritage?" If so, does it include the mineral riches of the deep seabed? (And, perhaps by extension other global "commons" such as Antarctica, the Arctic, outer space?) Or is the common heritage something even broader, perhaps including all technology used in the exploitation of the earth? The

answers to these questions will determine much of the structure of world order in the next century. They will be part of resource conflict, of the debate over the distribution of global wealth and power, and they may well change the face of international politics, economics, and law.

B. Statement of Research Questions

This dissertation focuses on two broad questions. The first is: How important is the issue of marine technology transfer to the emerging ocean regime and the Law of the Sea Treaty? The second major question is: What are the implications of the technology transfer regime as it finally evolved for policy planners and how could it be improved to induce full Western participation in the Treaty?

In essence, the first question is analytic in nature, calling for an evaluation of the political, economic, psychological, and military forces at work during the Conference. The interplay of the negotiating groups, their

use of tactics and strategy as the Conference unfolded, and the role of their relative levels of power and influence will be examined. The structure for this portion of the analysis is the use of the Keohane-Nye model for examining political processes. Goals of actors, instruments of state policy, agenda formation, linkage of issues, and roles of international organizations are the set-points for evaluation. In particular, given the tendency of the ocean regime to operate in a mode of "complex interdependence," I⁸ will focus on the political and economic forces at work. These forces are particularly apparent in the technology transfer sections of the Treaty, which will be the unifying elements of the overall discussion. By analyzing the actions and intentions of the actors toward the marine technology transfer portions of the Treaty, an overall pattern indicative of the Conference will become clear. The idea is to determine the role of technology transfer as an issue in the final formation of the Treaty. Some of the ancillary questions involved, beyond those indicated above, will include: Were the technology transfer provisions a reflection of larger conflict between the industrial powers

⁸"Complex Interdependence" and other fundamental concepts of the Keohane-Nye model will be explained in depth below. The basic source is Robert O. Keohane and Joseph S. Nye, Power and Interdependence (Boston: Little, Brown, 1977).

and the developing countries? What was the position of the major industrial consortia toward the provisions? Were the international organizations (primarily the U.N. group) actively lobbying in favor of the technology transfer provisions? What compromises were made in the course of the negotiations and why? How did the final outcome reflect the wishes of each of the primary actors involved---industrial countries, developing countries, multi-national consortia, and international organizations? What sub-groups within these major groups of actors had defined and active positions on technology transfer? In summary, the overall question is the importance of technology transfer as an issue in the Law of the Sea Treaty negotiations.

The second major question is less analytic and more prescriptive in nature. Having analyzed the formation of the major sub-regime of marine technology transfer in the larger ocean regime, I will try to describe its importance to policy planners and suggest certain ways to improve the system.⁹ The focus will be on the situation of the Western powers who are generally in favor of the new regime as

⁹ "Regime" - See note 5, above.

"Sub-Regime": Within a regime, specific issue-areas which themselves exhibit principles, norms, rules, and decision-making procedures, although to a less fully developed degree; i.e. technology transfer as a sub-regime of the ocean regime.

embodied in the Treaty but are unlikely to enter it due to the deep seabed mining/technology transfer provisions involved. The dissertation is not written exclusively from the U.S./Western point of view, however. It is hoped that the approach is even-handed and unbiased, and that it will provide realistic solutions that all parties to the conflict might be able to accept. Some of the questions I will address in this second part are: What is the future for the new ocean regime and the technology transfer sub-regime as currently written? Will the Western countries currently standing outside the Treaty be willing to accept it as written, or will changes be required? Can the Treaty stand alone without the major maritime and industrial powers who have rejected it to date, primarily the U.S.? Can the "hold-outs", the U.S./U.K./West Germany et. al. "go it alone?" In what ways will the technology transfer sub-regime require change to gain acceptance? Will those changes be impossible to institute given the current climate in North-South (and East-West) relations? What is the most practical and possible set of changes that both sides might find acceptable? How will it be possible to

make these changes given the end of the Conference? What role can the Preparatory Commission, as the "bridge" between the Treaty and the eventual creation of the ISA, play in making such changes? What is the future of the emerging ocean regime and the technology transfer sub-regime? Overall, my hope is to offer realistic, effective ideas that might make a contribution to the gradual process of shaping an effective, efficient, and equitable world order for the oceans.

C. Explanation of Methodology and Research Technique

The primary methodology employed will consist of interviews with well placed individuals and an examination of primary source documents, including United Nations and U.S. government archives. The relevant documents are unclassified, and I was granted access to the files at the Department of State, the Navy Staff, and the Department of Defense. The United Nations documents are available from the office of the Preparatory Commission in New York, with whom I established contact.

The leading libraries for the study of the topic are all in the New England Area. The best are the Claiborne Pell Library of the University of Rhode Island, the Alfred Thayer Mahan Library of the Naval War College, Harvard's main and specialized libraries, the library of the National Maritime Fisheries Service and the Woods Hole Oceanographic Institute in Woods Hole, the Ocean Engineering Library of M.I.T., and the U.N. and U.S. documents collections of the Tufts/Fletcher libraries. The U.S. Naval Academy also has a specialized collection in the subject which I have examined. Most of the key personnel have made themselves available for interviews over the past two years. I have conducted several important selected discussions with leading figures in the past year, and most of the key players were extremely cooperative in the course of this undertaking.

Beyond the collection of data, my method is analytic and prescriptive. The overall focus is obtaining multiple opinions from a wide variety of actors involved in the process (industrial governments, developing country governments, multi-nationals, and international

organizations) and attempting to present and analyze all sides of the conflict within the technology transfer question.

D. Contribution

I was encouraged to undertake this particular topic for two reasons. First, it is being written at an opportune moment, just as the "dust is settling" from the long negotiating project that created the Law of the Sea Treaty. Most of the first-hand participants have deep emotional involvement with the Treaty process, either pro or con, and the writing to date has been primarily polemical or predictive. Very few observers seem to have "mixed feelings" about the Treaty. It is an excellent time for an objective writer to approach the various critical issues (of which marine technology transfer is certainly one) and analyze them in the "cold light of morning," so to speak. This type of analysis can offer important insights into the negotiating structure and process that shaped the ocean regime. In a larger sense, the techniques and

lessons of the Law of the Sea talks could well be part of a greater trend toward negotiating world order in an increasingly interdependent global structure. This moment in time offers a sort of window into the process.

Archibald McLeish, the poet and writer, once commented that "all that is required of us is to recognize the break between the centuries." Obviously he was referring not to the chronological break between the years, but to the moments in time when great changes occur. Such moments are not always apparent, and perhaps the Law of the Sea and its impact on world and ocean regimes is more significant than its meager press would indicate. The debate over its acceptance or rejection, and of the sub-regimes involved, is indicative of a larger debate that is surrounding a "break between centuries." I hope I can illuminate this to some degree in the first part of this dissertation. Second, I hope I can make practical policy prescriptions that can contribute to an evolving ocean regime and in a larger sense to a more orderly world. I think few would disagree with the premise that the basic ideas represented by the Law of the Sea Treaty---the replacement of

comparative anarchy with an orderly, equitable, negotiated system of management---are good. The debate, of course, is centered around the style and substance (the process and structure, if you will) of the management system. Rather than ignore the valid and positive aspects of the Treaty, it should be possible to improve it and gain more universal acceptance for it. The goal of creating a stable world order is clearly at the heart of U.S. (and many other country's) foreign policy. Such a stable world order permits trade and economic expansion, and enhances national security. A negotiated ocean regime is an extremely positive fulfillment of this traditional central goal. In the second part of my dissertation, I hope I can offer practical suggestions to ensure that the positive aspects of the Treaty are not dismissed in an orgy of ideology centered around the less attractive aspects of the document. It is my hypothesis that one area in need of practical improvement is the technology transfer sub-regime. In making prescriptive judgements, I hope I can contribute in some way to the evolution of a better system of organization---a regime---for the oceans.

II. History and Background

A. Historical Development of Ocean Regimes

Men have sought for centuries to control the oceans. In addition to simply developing the ability to use the seas as a means of transport, an avenue of trade, a source of wealth, and a strategic arena, men have sought to impose control of another sort---an organized, structured ocean regime. The progression from the anarchy of the earliest voyages on inland seas to the emerging regime of the modern oceans has been long and full of conflict among the major actors. It is important to briefly trace the evolution of ocean regimes through the centuries in order to better understand the political and economic forces that have gradually coalesced into the modern version of man's long-standing attempts to impose legal order on the world ocean.

B. Mare Clausum versus Mare Liberum

There has been a single consistent theme in the long history of the law of the sea---the conflict between the concept of free seas (Mare Liberum) and controlled seas ((Mare Clausum)). As D.P. O'Connell has commented, "The tension between . . . (Mare Clausum and Mare Liberum) . . . has waxed and waned through the centuries, and has reflected the political, strategic, and economic circumstances of each particular age."¹ He goes on to point out that whenever one or two great powers achieve a dominant position on the seas, there is a tendency for free seas to become the overriding norm of the regime. When numerous smaller states share power more or less equally, the tendency for claiming small sections of the oceans has arisen. Jon Jacobson has pointed to a "pendulum" effect between Mare Clausum and Mare Liberum that can be traced from antiquity to the present day.² It is possible to view the events of UNCLOS III in keeping with this sort of systemic pattern, as will be discussed below.

"At the dawn (7th Century) . . . most maritime states

¹D.P. O'Connell, The International Law of the Sea (Oxford: Clarendon Press, 1982), p. 1.

²Jon Jacobson, Professor of International Law, Oregon University, Interview, Kingston, RI, June, 1983.

claimed sovereignty over certain seas; Venice claimed the Adriatic, England the North Sea, . . . Sweden the Baltic,³ and Denmark-Norway all the North Seas." The thrust of the claim of territoriality was dual in nature: A desire for economic benefits accruing to the state that was able to impose trade routes, levy shipping duties, reserve fisheries, and develop merchant monopolies; and political-strategic benefits derived from control of maritime "chokepoints," suppression of piracy, and mastery of sea lanes of communication.

For centuries, segments of the oceans were controlled by individual states, with little formal interaction between competing segments. By the early sixteenth century, this policy of Mare Clausum reached a peak with the Bulls of Pope Alexander VI, which in 1494 divided the New World (and the Oceans) between Spain and Portugal. In terms of the law of the sea, the effect was to give legality (at least in the eyes of the Catholic world) to Spain's claims to the entire Pacific and Gulf of Mexico, and Portugal's control over the Indian Ocean and much of the Atlantic. Both countries issued declarations of

³J.L. Brierly, The Law of Nations (Oxford: Clarendon Press, 1963), p. 304.

sovereignty and attempted to exclude foreign trade,⁴ shipping, and war ships from their respective areas. It was to counter the Portugese claims stemming from the Bulls of Pope Alexander that Grotius would begin to write his enormously influential works on the freedom of the seas in the 17th century.⁵ During the 15th and 16th Centuries, the idea of sovereignty over the seas was a standard norm of the ocean regime.

By 1608, however, Hugo Grotius had begun to write forcefully on the subject of freedom of the seas. His pamphlet, Mare Liberum, was in fact a legal opinion issued to support the rights of the Dutch to navigate freely in the Indian Ocean. His basic principles (which ran counter to the Bulls of Pope Alexander) were derived a priori from principles of Roman Law. He argued that the sea was unlike the land and could never be occupied. It was an avenue of commerce and by its very nature could not fall under the sovereignty of any one state or power.⁶ He was making an economic argument as well as a legal one, stating in effect that the oceans represented a non-zero sum game---although he phrased it a bit differently. His argument was that the

⁴Charles G. Fenwick, International Law (New York: Meredith Publishing Co., 1965), p. 497.

⁵Hugo Grotius, Mare Liberum, as quoted in D.P. O'Connell, The International Law of the Sea, p. 2.

⁶Ibid., pp. 2-3.

bounty of the oceans was virtually inexhaustible, thus strengthening the argument that occupation by a single power was moot.⁷ The implications of the doctrine of freedom of the seas are clear---if a single state cannot control the oceans, then an international regime should evolve in order to provide the order and control that the national sovereign would have provided under the Mare Clausum concept. Grotius was not greeted with overwhelming acceptance. Ironically, one of the loudest protests to the doctrine of freedom of the seas came from England, in the writing of John Seldon. In 1635, he published a pamphlet entitled simply, Mare Clausum, in which he defended the right of nations to maintain sovereignty over sections of the oceans. As the century progressed, however, the legal arguments were gradually overtaken by very real political and economic events---the rise of the sea powers. As it became clear to the European great powers that trade, commerce, and colonies were the real fruits of sea control (as opposed to fishing rights and imposition of monopoly rents), it became inevitable that an open ocean regime would eventually emerge. "It was only at the end of the

⁷J.L. Brierly, The Law of Nations, p. 305.

seventeenth century, when sea powers became dominant all over the world, that the doctrine of the territorial seas ending at three miles from the coast began to be generally⁸ accepted."

While a debate continued for several hundred years, by the early 19th Century both legal experts and the practice of nations had established a fairly clear ocean regime based on the concept of freedom of the high seas and territorial waters limited to cannon range. O'Connell comments, " . . . it was not until after the Napoleonic Wars, and indeed not before the 1840s, that the process was⁹ complete." Clearly, the connection between the solidification of the "free seas" concept and the final dominance of England (the Pax Britannica) was not coincidental.

C. The Pax Britannica

During the 19th Century, Britain's mastery of the seas allowed a highly functional ocean regime revolving around free seas to exist. By the mid-1800s, the last vestiges of

⁸F. Luard, Types of International Society (New York: Praeger, 1976), p. 297.

⁹D.P. O'Connell, The International Law of the Sea, p. 19.

sea control over deep water fishing rights had been tacitly abandoned. This occurred when Great Britain and Denmark ended long-standing claims for traditional fishing zones on the high seas.¹⁰ The Pax Britannica functioned as the ultimate arbitrator of the ocean regime through the 19th and early 20th Centuries, with the Royal Navy acting as the sanctioning force. It was during this period of stability that many of the fundamental principles, norms, and rules of the ocean regime were codified formally for the first time,¹¹ beginning in the 1880s and 1890s. The elements of the traditional law of the sea, which had been established by customary usage over the preceeding centuries, finally coalesced into the liberal ocean regime of free seas. Earlier principles and norms concerning suppression of piracy, treatment of castaways, war at sea, blockade, protection of neutral rights, and functional "rules of the road" (navigational regulations) were all subsumed into the ocean regime in a more or less formal manner. The British did not pursue a simple territorial dominance over the oceans because they realized the benefits of a liberal regime which would allow international trade to flourish.

¹⁰J.L. Brierly, The Law of Nations, p. 306.

¹¹D.P. O'Connell, The International Law of the Sea, p. 20.

They were also able to utilize a series of unarticulated, informal alliances to participate in sea control---with the U.S., the Japanese, the other European powers---to varying degrees at different times. As a general concept, the U.K. was supported by the other major maritime powers, at least in establishing an orderly regime of the oceans. Decision-making was effectively undertaken by a combination of treaty-law, gunboat diplomacy, and collective consensus among the major maritime powers.

The First World War swept away many things---but not the regime of the oceans. The Pax Britannica, at least in the maritime field, emerged bloodied, but essentially unbowed. Despite threats and building programs from the United States and Japan (and to a lesser degree France and Italy), the British were able to retain overall control of the maritime environment. The Washington Naval Conference of 1921 ensured that the United Kingdom would remain at least equal to her principal maritime rivals without undertaking a massive naval build-up that might well have hastened the overall decline of the British Empire. By accepting rough naval parity with the U.S., England was

acknowledging that the "trident of Neptune" would have to eventually be passed across the Atlantic, if not simply broken into pieces and spread throughout the seafaring world. In a summarizing comment, Archibald Hurd, the editor of the prestigious Brassey's Naval Annual, concluded, "the trident of Neptune passes into the joint guardianship of the English-speaking peoples."¹²

Thus, the driving mechanism of the post-WWI ocean regime remained freedom of the high seas. While the U.S. (and several other powers) deviated slightly from the basic principles during the 1920s---to control smugglers during the prohibition---the three mile limit of territorial seas and the open ocean system beyond continued as it had for the previous hundred years, albeit with an increased level of international participation. The power equation on the ocean was still in the hands of two or three key players (including Britain, the U.S., Japan primarily), and freedom of the high seas was still the guiding principle. A strong indication of continuing support for the open ocean concept occurred at the 1930 Hague conference, where "twenty states representing 30 percent of shipping tonnage supported a

¹²Forrest Davis, The Atlantic System (New York: Neynel and Hitchcock Press, 1941), p. 279.

three mile territorial limit."¹³ The League of Nations, established in the 1920s, was also an important forum where codification of existing law of the sea was undertaken in the interwar years.¹⁴

D. Post World War II

The Second World War completed the process begun in 1914---the dismantling of British naval dominance and the attendant influence of the Pax Britannica on the law of the sea. The United States had built the largest and most powerful fleet the world had ever known, and exercised clear maritime hegemony by the end of the war. The Soviet Navy was composed primarily of captured German submarines, and the British Fleet was battered from almost a decade of continuous combat without relief, replacement, or overhaul. The U.S. had clearly moved into Britain's role and become the dominant actor in the ocean regime. This was further demonstrated by the unilateral character and acceptance of the Truman Proclamation of 1945. The Proclamation, announced on September 23, established control by the U.S.

¹³Robert Keohane and Joseph Nye, Power and Interdependence (Boston: Little, Brown, and Co., 1977), p. 93.

¹⁴D.P. O'Connell, The International Law of the Sea, pp. 20-21.

over its continental shelf, defined as the natural geographic extension of the nation's coastline out to sea, generally to roughly 200 nautical miles. "The U.S. regards the natural resources of the subsoil and seabed of the continental shelf beneath the high seas as subject to its¹⁵ jurisdiction and control." The Proclamation does affirm the right of navigation of the "waters above the continental shelf" but ultimately represented an abrogation of the traditional complete freedom of the high seas espoused by the U.S. and other sea powers during the Pax Britannica. During this same period, several Latin American nations made declarations even more contradictory to the principles of the free seas. Chile, Peru, and Ecuador all claimed 200 nautical mile territorial seas, and¹⁶ participated in the Declaration of Santiago in 1952. Other countries were beginning to make similar claims, either officially through unilateral proclamations or through usage. Prior to describing the efforts of the international community to resolve these conflicts within the ocean regime, it is important to briefly outline some of the reasons for the sudden surge in governmental claims

¹⁵U.S. Department of State Bulletin, Volume 13, Number 327, Washington, D.C., September 30, 1945, p. 485.

¹⁶"Critical Decisions Concerning the Law of the Sea," Department of State Talking Paper, July, 1981.

over what had previously been regarded as high seas.

One key element of the decision for many governments to attempt to assert sovereignty over former high seas areas was the advance of technology. So long as nations had lacked the means to exploit the deep seabed or the continental shelf, they were willing to allow the ocean regime to function as a free seas system. When technology provided the means of exploiting the continental shelf for hydrocarbons (oil and natural gas) and minerals, many countries (and most notably the U.S., the major actor in the late 1940s and early 1950s) decided to try and force a change in the rules of the game. The Truman proclamation and subsequent declarations by other nations (particularly Latin American countries) of territoriality extending into former free seas regions was a direct reflection of this.¹⁷

A second reason for the change in the rules of the regime was strategic in character, reflecting changes in effective weapons ranges that had been building since the turn of the Century. The three mile limit had originally been set based on the range of a cannon shot, and many actors in the international ocean regime were painfully

¹⁷ Louis Sohn and Paul Irwin, Law of the Sea (Cambridge: Draft Text, 1982), Chapter VIII.

aware that weapons had advanced considerably in range and accuracy since the early part of the 20th Century. There was a consequent push for expanded territorial seas, which would give coastal states more control over the presence of weapons platforms in their immediate offshore areas. This was a particular consideration in the early post war (WWII) period, when ballistic missile firing submarines were being designed and tactical aircraft operating from carriers were making it possible to strike more deeply into a country's territory from the sea than ever before.

A third major reason for the change in the rules of the game stemmed from the flood of new nations created in the aftermath the Second World War. The newly independent countries were anxious to demonstrate their political status and control some portion of their environment. One area in which they could demonstrate their sovereign status was in marine affairs, particularly on the issues of territorial seas. Some of the countries which made such unilateral declarations included India, Indonesia, and many African states. This was in addition to the Latin American countries, who were particularly aggressive in

claiming large ocean areas as territorial seas. In many cases, the declarations were intended for domestic consumption, given the limited capabilities such countries had to exploit their offshore regions. They did, however, have the effect of further confusing the overall status of the ocean regime's principles, norms, and rules. In response to this, the major nautical powers (the U.S., U.K., U.S.S.R., and France) became concerned about the effect of the new "territorial seas" on their strategic mobility and sea power.

Taken together, these factors combined to produce the need for some re-codification of the rules of the game in the ocean regime. The efforts of the international community to do this led directly to the United Nations Conferences on the Law of the Sea.

E. UNCLOS I and UNCLOS II

As discussed above, the post war years saw growing confusion and tension surround the ocean regime. Political, strategic-military, and economic forces combined to create

the need for a new codification of the law of the sea. One of the first tasks undertaken by the United Nations' sponsored International Law Commission was precisely this sort of re-statement of the rules of the game. The ILC prepared a series of Draft Articles on the law of the sea which were presented to the General Assembly in 1956. These same Draft Articles were the basis for the First United Nations Conference on the Law of the Sea (UNCLOS I),¹⁸ which convened in Geneva in 1958. The United States, Great Britain, and other leading Western industrial powers led the effort to convene the new law of the sea conference, which eventually passed four major¹⁹ conventions:

1. Convention on the High Seas: (Concluded at Geneva, April 29, 1958. Entered into force for the U.S. September 30, 1962) Defined the high seas, and promulgated a basic affirmation of the freedom of the high seas. Importantly, it did not establish the limits of the territorial seas, because the participants were unable to agree upon such a specific limit.

2. Convention on the Continental Shelf: (Concluded

¹⁸D.P. O'Connell, The International Law of the Sea, p. 21.

¹⁹B. Weston, R. Falk, A. D'Amato, Basic Documents in International Law and World Order (St. Paul, MI: West Publishing Co., 1980), pp. 316-329.

at Geneva, April 29, 1958. Entered into force for the U.S. on June 10, 1964) Basically affirmed the Truman Proclamation and gave each state the right to economic control over the seabed and subsoil of its Continental Shelf. Somewhat vague in defining exactly where the Continental Shelf ended.

3. Convention on the Territorial Sea and Contiguous Zone: (Concluded at Geneva, 29 April 1958, Entered into force for the U.S. on 10 September 1965) No firm limit on territorial seas or on rights of passage through territorial seas was established, although it did help to define the rights of a state within its territorial sea and contiguous zone, as well as the establishment of "baselines" from which the zones could be measured.

4. Convention on Fishing (Concluded at Geneva, April 20, 1958. Entered into force for the U.S. March 20, 1966) Extremely vague about the rights and duties of states to regulate fishing in their coastal areas.

The effect of the four conventions that emerged from UNCLOS I was to provide some agreement on the regime of the oceans. Several important specific questions remained

unanswered, notably the limit of the territorial seas, the regulation of offshore fishing, and the bounds of the continental shelf. On the whole, however, UNCLOS I must be judged a success. It provided a meaningful and practical expression of the collective will of the international community (despite its inability to decide on a specific territorial sea and its vague approach to certain other issues), as well as codifying some important principles, norms, and rules. There was no mechanism established for formal decision-making (such as future decisions about the oceans), but the treaty-negotiation process had given legitimacy to the results, both as formal treaty law and as an embodiment of gradually forming customary law.

Perhaps the fundamental problem faced by the UNCLOS I conventions was simply its moment of birth---the new system emerged just as the international system as a whole was entering a new period of change. The years from 1958, when the UNCLOS I conventions emerged, to 1968, when UNCLOS III effectively began, were extremely turbulent. The Bretton Woods economic system was under increasing pressure, the technological capabilities of the world's nations to

exploit the oceans were advancing, many countries were emerging from colonial rule with whole new sets of demands, aspirations, and beliefs, the hegemonic power of the U.S. was dissipating, the Soviet Union was increasing its marine influence to a point where it rivaled the U.S. and surpassed Britain, and resources were being squeezed globally in the face of a rapidly expanding world population. It doesn't seem suprising that a new regime of the oceans capable of reacting to the changing world situation soon became necessary.

The necessity for further refinement of the UNCLOS I conventions was recognized early on. Indeed, a second conference was called fast on the heels of the first. UNCLOS II, opened in 1960, attempted to resolve some of the leftover issues from the first gathering. The Second conference was not a success. The closest the delegates could come to settling any of the outstanding issues was a "compromise proposal for a six-mile territorial sea and an additional six mile fishery zone." This failed to muster the needed two-thirds majority by a single vote.

Overall, UNCLOS I and II made a start on codifying

some major issues in the ocean regime. They provided a starting point for the delegates who came together in UNCLOS III, although they were only a rudimentary outline compared to the complex negotiations of the Third Conference. Of the 86 countries that participated in the First and Second Conferences, the number of states that finally signed and ratified the Conventions ranged from 35 to 55, although most of the rest followed the general regime as customary law or merely in the face of the implicit strength and influence of the larger countries that did sign the treaties.²⁰ The two Conferences left many unanswered questions and problems. This led directly to the call for a Third United Nations Conference on the Law of the Sea (UNCLOS III)

F. UNCLOS III

The genesis of UNCLOS III was a result of two separate sequences of events. The first was an initiative taken by the Soviet Union in 1967. Russian strategic planners approached their American counterparts and inquired whether

²⁰United Nations Chronicle, "Sea Law---A Rendezvous With History," June, 1982, p. 14.

the U.S. might be interested in sponsoring a third law of the sea convention for "the sole purpose of establishing a 12 mile territorial sea."²¹ The U.S. response was positive, and delegations from both countries met to work out a short, two or three article treaty that both countries believed could be essentially forced on the rest of the world. To U.S. and U.S.S.R. officials involved in the negotiations, it seemed at the time as though anything proposed by the two superpowers jointly would be easily passed through any world deliberative process. Eventually the twin delegations agreed on a new LOS convention that would "(1) fix the breadth of the territorial sea at 12 miles and (2) preserve, in those international straits which would become overlapped by territorial seas, freedom of navigation as though a corridor of high seas continued to run through such straits."²² Thus, the two superpowers sponsored the convention under the impression that they would be able to orchestrate a short, practical session and force through their strategic-transit passage regime on the rest of the world.

At almost precisely the same time, the U.N. General

²¹"The Critical Decisions," Department of State Talking Paper, p. 3.

²²Ibid., p. 4.

Assembly was electrified by a remarkable speech made by Ambassador Avrid Pardo of Malta, who called for a new regime of the oceans that would place the valuable minerals of the deep seabed in trust as the "common heritage of mankind." His speech managed to catalyze many of the political and economic forces that had been gathering in the General Assembly during the 1960s, as the newly independent nations found themselves in numerical and practical control of the United Nations. As this seemed to dovetail nicely with the joint U.S./U.S.S.R. call for a new conference on the oceans, the General Assembly established a 35 member committee to study the peaceful uses of the seabed and the ocean floor in late 1967.²³ The disarmament issues were separated from the rest of the study, at the behest of the U.S. and U.S.S.R., and the committee concerned itself primarily with Ambassador Pardo's concept of the "common heritage." The members of the U.N. recognized the changing environment of the world, the advances in technology, and the desire on the part of the developing world for changes in the world order. The project received much support from the General Assembly.

²³United Nations Document, SEA/460, 3 March 1982, pp. 16-17.

In 1968, a slightly larger committee was created (with 41 members) and named the Committee on the Peaceful Uses of the Seabed and the Ocean Floor Beyond the Limits of National Jurisdiction. More states joined this committee, and by 1971, it had 91 members. This group was instrumental in drafting and lobbying the General Assembly into accepting Resolution 2749 (XXV), the "Declaration of Principles Governing the Seabed and the Ocean Floor Beyond the Limits of National Jurisdiction" This was the first General Assembly formal recognition of the "common heritage," and the declaration goes on to state that the seabed will not be subject to "appropriation by any means by States or persons." The U.S. joined in the adoption of this resolution, which actually came to a vote in December of 1971.²⁴ The General Assembly also decided in early 1971 that a new law of the sea convention would be convened to discuss the issues of the deep seabed, continental margin, navigation, and fisheries. The U.N. Seabed Committee functioned as the preparatory committee for UNCLOS III through 1972 and 1973, and the Conference actually began in December of 1973.

²⁴ United Nations General Assembly Resolution 2749,
p. 24.

When the Conference actually convened, it was charged with establishing an equitable international regime for the entire global sea, including oceans, ocean seabed, areas of transit, continental shelves, fishing areas, as well as determining some guidelines for all peaceful uses of the oceans. It was an ambitious undertaking, to say the least. The work of UNCLOS III would eventually consist of eleven major sessions from 1973 to 1982, and involve over 5,000 delegates throughout the complex negotiating sessions. In order to gain some appreciation of the pace and results of the various sessions, the following summary of the action²⁵ is offered:

First Session: (New York, December, 1973) The rules of procedure for the Conference were established and the first officers elected, with Hamilton Amerasinghe of Sri Lanka serving as the President of the Conference. There were 115 countries represented at the opening of the negotiation.

Second Session: (Caracas, June/August, 1974) The rules of procedure were formally adopted by the Conference. General views among the countries were exchanged in open

²⁵The summaries which follow have been drawn from a variety of sources, including the historical articles in the American Journal of International Law (see bibliography), Department of State Talking Papers, interviews, etc.

debate, and negotiating groups were gradually forming. Some of the more important groups, which will be discussed in depth in subsequent sections, were the Group of 77 (Less Developed Countries); the industrial-Western countries, primarily the OECD nations; the Soviet Bloc; the Island and Archipelagic states; and the Geographically disadvantaged and landlocked states. It is important to bear in mind that these groups were often overlapping and somewhat diffuse around the periphery, yet they were the major actors in the negotiation.

Third Session: (Geneva, March/May, 1975) The Single Negotiating Text (SNT), a preliminary rough draft of the Treaty, was produced. The draft was basically in Treaty-style language, and it provided an important starting point for the delegates to begin issue-bargaining.

Fourth Session: (New York, March/May, 1976) The results of further deliberation were produced in the form of a Revised Single Negotiating Text (RSNT), where the most controversial issues arose. Some of the problem areas with the RSNT included the establishment of territorial seas limits, fishing rights, the concept of the exclusive

economic zone (EEZ), deep seabed mining, straits passage, and technology transfer. The overlapping membership in the various negotiating groups produced a complicated bargaining arena, but the overall dynamic of the Conference was very clear---the developing countries (G-77) versus the industrial powers. The developing countries held a great deal of functional power in directing the development of the text due to their numbers, general cohesiveness via the G-77 group, and the general mid-1970s pro-development attitudes, which had certainly been sharpened by the success of OPEC during the preceeding few years. On the other hand, the industrial powers had a powerful position via their economic, technological, and political-military power. While the Conference never became a simplistic North-South shouting match, the primary dynamic revolved around conflict between the industrial countries and the LDCs. The situation was of course complicated by the multiplicity of interests held by many of the state actors, as will be discussed in depth in subsequent sections. During the 1976 sessions (both the Fourth and Fifth meetings of the Conference), there was considerable "give"

on the part of the U.S. and most major industrial countries. Secretary of State Henry Kissinger agreed to important concessions (including the "parallel system" for deep seabed mining and mandatory technology transfer) ²⁶ during the summer of 1976.

Fifth Session: (New York, August/September, 1976)

Progress was made on the territorial seas, fishing questions, and assorted other problems, but the deep seabed mining issues were clearly emerging as the sticking point in the negotiating process. The industrial countries preferred position was a frontier "claims office" approach, where the advanced consortia would simply pick an area and begin mining, perhaps paying some form of royalty to appease the "common heritage" principle. The developing countries, on the other hand, wanted to slow or halt the development of the deep seabed for two major reasons. The first was to protect the land-based producers, most of whom were developing countries; and the second was to allow the LDCs a chance to gain the technology and capital to participate in the investment process. This issue, and the sub-issues that emerged (such as the composition of the

²⁶ "The Critical Decisions," Department of State Talking Paper, pp. 17-21.

International Seabed Authority, the rules for mandatory technology transfer, and so on) remained the primary point of controversy throughout the negotiating process.

Sixth Session: (New York, May/July, 1977) An Informal Composite, Negotiating Text (ICNT) emerged from continued work on the deep seabed issues. The newly installed Carter administration was much more amenable on several key issues than the previous U.S. governments. The entire Conference was at its mid-point (although most observers at the time thought it was close to completion), and the following progress had been made on some of the critical ocean regime issues:

1. Acceptance of Three Sub-Regimes: Territorial Seas would be allowed out to 12 miles; the Continental Shelf would be for the exclusive economic exploitation of the coastal state, along the lines of the Truman Proclamation; and the High Seas (but not the deep seabed beneath them) would be managed along the lines of the 1958 UNCLOS I Convention.

2. Provision for Transit Through International Straits: Irrespective of the extension of coastal state

territorial waters, vessels would have rights of unimpeded transit through major global straits. The importance of this provision to the major naval powers (U.S., U.S.S.R., U.K., France) and the major commercial shippers was key to the entire negotiating "bargain."

3. Establishment of the Exclusive Economic Zone: The rights of the coastal state to the economic exploitation of the seabed and waters within 200 nautical miles of its coasts was absolute, regardless of the geographic disposition of the continental shelf.

3. Strong Environmental Norms were also created, including the means for broad regulation and meaningful sanctions.

4. Dispute Resolution: An international tribunal, patterned on the International Court of Justice was developed. Its mandate would allow it to rule on a wide variety of disputes related to the seabed and the oceans. There would be a special chamber established exclusively for seabed disputes, and the mechanism for mandatory dispute resolution was also put in place.

During the sixth session, however, the increasing

difficulty of settling the seabed issues was becoming apparent, and many of the bargains involved in the five settled issues described above were dependent on the satisfactory resolution of the seabed controversy.

Seventh Session: (Geneva, March/May, 1978. New York, August/September, 1978) In order to try and settle some of the outstanding issues involved in the deep seabed portions of the Treaty, the Conference established seven negotiating groups to deal with small sections of the mining clauses. The problem areas within the deep seabed mining sections of the Treaty had to do with the proposed International Seabed Authority (which will be discussed in depth below). The industrial countries believed the various organs of the Authority (Council, Enterprise, Tribunal, etc.) were structured in such a way as to make for complete dominance by the developing countries. They particularly objected to the provisions for mandatory technology transfer, Council membership, Treaty change after the initial review, and the powers of complete regulation granted to the organization over the entire seabed. The session finally adjourned with hopes for completing the text during the Eighth Session,

scheduled for the following year.

Eighth Session: (Geneva, March/April, 1979. New York, July/August, 1979). One of the first and most important decisions at the Eighth Session was to aim to complete the work on the Convention by 1980. This goal served to spur the delegates into a high level of activity and several compromise positions emerged from the session. A working draft of the Treaty, the Informal Composite Negotiating Text (ICNT) was finally adopted, along with several compromise positions on the remaining continental shelf problems (exact geographical limits), rates of revenue sharing for land-locked countries, and many new positions on the deep seabed mining issues, which were accepted by the Western powers as "the best that could be had." The outstanding issues remaining after the Eighth Session included financing for the Enterprise, the selection and approval process for applicants for mining permits, and the exact methodology for the mandatory technology transfer process.

Ninth Session: (New York, March/April, 1980. Geneva, July/August, 1980) A new rough draft of the Convention was

introduced, containing the cumulative work of the Conference. The group vowed to hold its Tenth and "final session" in New York in 1981, and feeling ran high that the Convention would be opened for signature by the end of that year. Optimism about the accord and its prospects for completion were probably at an all-time high.

Tenth Session: (New York, March/April, 1981. Geneva, August, 1981) The Reagan administration shocked the Convention by announcing that it had "major difficulties" with the seabed portions of the treaty (which had been approved through the highest levels of the Carter administration) and requested a one year delay for review of the document. The Official Draft Convention was issued, and the Conference voted to allow the U.S. its requested year to restudy the text of the agreement. West Germany and Jamaica were selected as the headquarters for the International Tribunal for the Law of the Sea and the International Seabed Authority respectively. Much speculation emerged over the U.S. position, and a great deal of bitter disappointment surfaced as the Reagan administration's overwhelmingly negative position emerged.

Eleventh Session: (New York, March/April, 1982) In a watershed final session culminating nearly ten years of difficult negotiation, the Reagan administration worked hard to gain very basic amendments to the document. The U.S. objections were focused on six areas. They included:

1. The U.S. belief that the Treaty would deter development of the deep seabed mining resources through production policies, production ceilings, limits on mining operations, and excessive regulation.

2. A perceived lack of assurance to the seabed resources, given the total control of the International Seabed Authority over the granting of licenses.

3. An unfair decisionmaking role in the deep seabed regime, meaning the U.S. was not guaranteed a seat on the Council, according to U.S. observers.

4. The amendment process to the Treaty could enact changes without approval of the participating states.

5. The establishment of undesirable precedents for international organizations, referring to the high degree of control over seabed mining given to the ISA by the Treaty.

6. Mandatory transfer of private technology would make it unlikely to receive the advice and consent of the U.S. Senate.

All of these objections were difficult issues that the Conference had thought settled during the late 1970s via complicated compromises. Ultimately, the U.S. eleventh hour efforts proved useless. As the President of the Conference, Tommy T.B. Koh of Singapore (who had been elected after the death of Amerasinghe in 1980) eventually admitted, "all efforts at reaching general agreement were exhausted." The Conference, which had hoped to adopt the Convention without dissent, was forced to call for a role call vote at the request of the U.S. The final acceptance of the Draft Convention was 130 to 4, with 17 abstentions. The four countries voting against the Convention were the U.S. (seabed issues), Israel (mention of the PLO in the Draft), Turkey (Aegean Sea disputes with Greece), and Venezuela (Oil problems). Of the abstentions, many are from the Western industrial countries, including Belgium, West Germany, Italy, the U.K., the Netherlands, and Japan; the U.S.S.R. and the rest of the Soviet Bloc also

abstained.

Signing Ceremony and Subsequent Events: On December 6, 1982, the signing ceremony began in Montego Bay, Jamaica. The four day process culminated the work of the longest and most complicated international agreement ever negotiated. In all, 119 nations signed the final Draft Convention in Jamaica, signifying their intent to ratify it. After 60 instruments of ratification have been deposited with the U.N., the Convention will come into force for signators after 12 months. Some of the abstaining countries have since signed, including Japan, the U.S.S.R., and most of the Soviet Block. The major hold outs remain the U.S., the U.K., West Germany, Italy, and Belgium, all major deep seabed mining investors. A Preparatory Commission, which is charged with laying the groundwork for the International Seabed Authority and translating much of the general Treaty provisions into practical rules and regulations, began meetings in Jamaica in the Spring of 1983. A President, Paul Engo of the Cameroon, was elected, and the Commission has now had two substantive meetings, with more scheduled. To date (early

1984), nine countries (Mexico, Fiji, and Jamaica, among others) have ratified the Treaty. There are ongoing efforts in many other countries to consummate the ratification process. While there is a wide disparity of view among experts, most observers seem to think that the required 60 states will ratify the Convention within five years, bringing it into force at least for signators.

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Overall, the Treaty process was a huge and complicated project, driven by political and economic forces that were shifting and inconsistent over the course of the negotiations. The resulting document was the essence of compromise. No one country could claim to be completely happy with the result, but large numbers of states seem satisfied with the general outcome. The general provisions of the Treaty are discussed in the next section, followed by an analysis of the political and economic forces that "drove the problem" as the Treaty evolved. After these background sections are complete, an examination of the

specific problem of technology transfer and its relation to the entire Treaty process will be undertaken.

G. Provisions of the Law of the Sea Treaty

The main provisions of the new United Nations Law of the Sea treaty are arranged around several specific issue areas. The Treaty itself, a 200 page, single-spaced document, contains over 300 articles divided into 15 major sections. While there can be no substitute for a careful reading of the entire document, this section will cover some of the highlights from each of the major sections of the document, with particular focus on the controversial deep seabed mining portions.

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28

Territorial Waters: According to the Treaty, states will be able to exercise sovereignty over the waters immediately adjacent to their coasts to a limit not exceeding twelve (12) nautical miles. The constraint on the coastal state's control is that all foreign vessels will be allowed the right of "innocent passage" (passage that does not threaten the coastal state's security)

²⁷ All the references in the section below are taken from the actual Treaty text, using the U.S. State Department version of June, 1982.

²⁸ LOS, Part II, pp. 3-14.

through the territorial waters for purposes of peaceful navigation. This was a controversial point that the 1958 accords had failed to settle. In this section, the Treaty goes on to specify how boundaries will be determined, as well as establishing a further 12 mile "contiguous zone" where the coastal state will have some limited forms of jurisdiction, although not complete sovereignty. One observer has remarked that the distinction is between the exercise of "sovereignty" and "sovereign rights."²⁹ The contiguous zone would be an area where customs, fiscal, immigration, sanitary, and police powers could be exercised.

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Transit Passage: This provision, crucial to the great maritime and naval powers (U.S., U.S.S.R., U.K., France), would allow "transit passage" through internationally recognized straits used for international navigation so long as the passage was direct, non-threatening, and in compliance with international regulations. (A maritime power is generally taken to mean a country with major geopolitical interests in the sea, including both military and commercial fleets. A naval

²⁹Professor Suzanne P. Tongue, The Fletcher School of Law and Diplomacy, Interview, Medford, MA, April, 1983.

³⁰LOS, Part III, pp. 15-20.

power is one with a major sea-going military component to its armed forces. At the present time, only the four countries mentioned above could be classed as both maritime and naval powers.) It would apply both for ships and aircraft, civilian and military. This was an important quid given the advanced countries for the quo of agreeing to the deep seabed provisions of the treaty. This was the so-called "great bargain" of the Conference, that many LDCs now believe was broken when the U.S. and other Western states refused to sign the Treaty.³¹ This section of the Treaty also assured the passage through major international passages (generally defined in terms of tonnage per annum---see Annex). These straits would remain open even if their waters were to become part of the territorial seas of the coastal states bordering them. This was particularly important given the number of international straits that would have fallen into territorial waters when the shift from 3 to 12 miles was accomplished. (See Annex) This section of the Treaty also details the rights and duties of vessels desiring "innocent passage" in connection with transit. It also gives the coastal states the right

³¹ Ambassador Alan Beesley, Canadian Representative to the Conference, Interview, Kingston, RI, June, 1983.

to establish regulations (of a traffic-pattern nature) in the straits.

32

Archipelagic States: According to the Treaty, states whose territory is comprised of large island groups (Indonesia, the Philippine Islands, Malaysia, etc.) are given extensive control over their "internal waters." This section of the Treaty was a direct result of the influence and negotiating skill of the "Island Group" during the Conference. For a typical state, internal waters are rivers, bays, coves, and other bodies of water inserted into the land territory of the state. The archipelagic states successfully argued that for an island-group state, internal waters must be much more loosely defined, generally to include the waters between the constituent islands, within certain Treaty-defined mileage limits. The methodology agreed upon by the Conference connects the outer baselines of the islands together and gives the archipelagic states the equivalent of "internal waters" within the island groups. The archipelagic states will provide complete rights of passage through specified sea lanes to ships of all nations.

³²LOS, Part IV, pp. 20-24.

33

Exclusive Economic Zone: One of the totally new concepts added to the ocean regime by the Treaty was the idea of the Exclusive Economic Zone (EEZ). It was prompted by the increasing ability of technology to exploit the sea and the seabed. Coastal states are granted sovereign rights (but not sovereignty) in the EEZ with regard to natural resources, economic activities, scientific research, and environmental preservation. The EEZ will otherwise retain the character of high seas, at least in regard to overflight, submarine cable laying, pipelines, freedom of navigation, and so on. The Treaty details the specific rights and duties of the states in the EEZ, including regulating artificial island construction, marine exploitation installations (oil rigs and deep seabed mining gear), conservation action, and law enforcement. The fishing questions that had been difficult to settle in the 1958 Conventions were addressed here, giving the coastal state strong, although not total, rights for fishing in the EEZ. The rights of land-locked states to participate in exploitation of coastal EEZs in their regions is explicitly stated. The questions of highly migratory species of fish,

³³LOS, Part V, pp. 25-38.

which are defined in Annex One of the Treaty and constitute about a dozen species of Tuna and Salmon, are also treated in the Treaty. The emphasis is generally on conservation and responsibility of the exploiting states to the global environment.

³⁴
High Seas: This section of the Treaty survived essentially intact from both the 1958 Conventions and generally from the earlier classical regimes of freedom of the seas. States will continue to enjoy the rights of navigation, overflight, submarine cable laying, artificial islands, fishing, and research. The Treaty goes on to discuss the obligations for signators for cooperation, suppression of piracy, combating drug-running and so on.

³⁵
Regime of the Islands: This section provides a brief definition of islands which allows States to use them in determining their territorial seas, although making the specific point that barren rocks "which cannot sustain human habitation or economic life of their own," are not islands.

³⁶
Enclosed or Semi-Enclosed Seas: Examples of an enclosed or semi-enclosed sea might be the Mediterranean or

³⁴ LOS, Part VII, pp. 44-54.

³⁵ LOS, Part VIII, p. 55.

³⁶ LOS, Part IX, p. 56.

Caribbean Seas, where more than two states border an enclosed area of ocean. The bordering states are called upon by the Treaty to cooperate in the management and conservation of the resources in the enclosed region. It is important as implicit recognition of the rights and duties of sub-regimes within the overall ocean regime.

37

Land-Locked States: This section is another example of a small negotiating group (land-locked/geographically disadvantaged states) working together to wield real power in the Conference. The statute grants continuous "right of transit" to and from the sea through the territory of transit states by "all means of transport."

38

Protection/Preservation of the Marine Environment:

Strongly lobbied for by many domestic internal groups in a wide variety of countries, these provisions are an important example of trans-national groups influencing international policy. The Treaty is squarely on the side of strong anti-pollution measures, including both ship- and land-produced pollution, overfishing and industrial waste from at-sea installations, such as deep seabed mining sites. This section of the Convention is important in the

³⁷LOS, Part X, pp. 57-59.

³⁸LOS, Part XII, pp. 98-119.

wide range of police powers which the global community has given to states in the area of pollution control. States are categorized as either coastal, port, or flag states, and are assigned very specific duties for control, clean-up and enforcement. The Treaty further calls for regional and global cooperation in order to preserve the marine world.

39

Marine Scientific Research: A second major example of trans-national groups working to influence policy is in the area of regulation concerning marine scientific research. In general, scientists are not happy with the final outcome, although they will admit, if pressed, that the Treaty is a little better than nothing.⁴⁰ Research in the EEZ and Continental Shelf will be by consent of the coastal state, but the states will be "obliged" to give consent if the research is for "peaceful purposes." Information thus derived must be shared globally through publication of results. The coastal state could deny permission, using the Convention as a guide, if the research was exploitative in nature, involved drilling or explosives, required construction, or was not for "peaceful purposes." If the organization desiring to perform the

³⁹LOS, Part XIII, pp. 120-130.

⁴⁰Dr. David Ross, Senior Scientist, Woods Hole, Interview, Woods Hole, MA, March, 1983.

research felt it had a likely case, it could submit to international arbitration. The rules are significant in recognizing the legal standing of scientific organizations and in providing a means of appealing a question that is essentially one of sovereignty.

41

Development and Transfer of Marine Technology: This section is a non-binding recommendation to states to promote the development and transfer of marine technology on "fair and reasonable terms and conditions." This section of the statute makes specific provisions for the rights of the holders of proprietary technology and security-oriented technology. This is not mandatory transfer of technology. The mandatory technology transfer provisions apply specifically to deep seabed mining, and will be discussed below. This section of the treaty is only a series of recommendations for transfer and sharing of technology, and does not enact any binding requirements on signators.

42

Settlement of Disputes: In another far-reaching and innovative portion of the Treaty, states would be obliged to settle their disputes by peaceful negotiation. Four

⁴¹LOS, Part XIV, pp. 131-136.

⁴²LOS, Part XV, pp. 137-155.

different options for dispute settlement are available under the Convention:

1. International Tribunal for the Law of the Sea
2. International Court of Justice
3. Arbitration
4. Special Arbitration Procedures

From a regime-organization standpoint, the establishment of a judicial branch, the new International Tribunal for the Law of the Sea, is a step toward a more binding structure. Coupled with the decision-making branch, the Council/Authority discussed below, and the principles, rules, and norms contained in the Treaty itself, it comes very close to fulfilling the overall concept of a total regime. The binding character of the arbitration for signatory states makes the Treaty particularly strong in this area.

43

The Area/Deep Seabed Mining: The "Area" is defined as "the seabed and ocean floor and subsoil thereof beyond the limits of national jurisdiction." In other words, the area is the floor of the ocean under the high seas. This section, the most controversial of the Treaty, concerns the

⁴³LOS, Part XI, pp. 60-97.

rights and duties of states wishing to exploit the deep seabed. The reason for the controversy can be explained on one level as the collision of the basic principles of the classic ocean regime (freedom of the high seas) and the newer principles of the emerging ocean regime (exploitation must be undertaken only with ultimate regard for the fact that the seas are the common heritage of mankind). The classic regime would have allowed exploitation of the deep seabed as part and parcel of the freedom of the seas doctrine. The new ocean regime, more concerned with commonality and equality of sovereign states, would exercise much stronger control over the exploitative process represented by deep seabed mining.

This portion of the Treaty is concerned with the resources of the Area. Resources are defined in the Treaty as "All solid, liquid, or gaseous mineral resources in situ in the Area at or beneath the seabed, including poly-⁴⁴metallic nodules. The Treaty starts this section with the fundamental affirmation of the common heritage principle and goes on to establish the most sweeping, positively-controlled regime for international behavior

⁴⁴LOS, Article 1; and Article 133, pp. 2/60.

ever enacted, at least as pertaining to the marine environment. It is within this section of the Treaty that the economic and political forces that comingled to create the entire regime become clearest. It is also within this section that the extremely controversial sections dealing with mandatory technology transfer occur. The political leverage of the developing world is evident in the passages concerning production policies, technology transfer (mandated for seabed miners), and provisions to protect land-locked and geographically disadvantaged states (mostly developing countries). The Treaty establishes a collection of international entities to function as the collective decision-makers on seabed and some general maritime issues. The first of these is the International Seabed Authority (the Authority or ISA), a governing body located in Jamaica, to which every state signator of the Treaty shall send a representative. The principle organs of the Authority include the Assembly, the Council, the Enterprise, and the Secretariat. The Assembly is similar to the General Assembly of the United Nations in that it has a representative from each country and generally makes

only broad, non-policy oriented statements. It will function under the one-state, one- vote principle just as the General Assembly of the U.N. does. It will have the power to elect the members of the Council and the Governing Board of the Enterprise (to be explained below). The Assembly will further control the fiscal concerns of the entire seabed system, assessing charges and distributing revenue. In terms of regime analysis, the Assembly will act as the arbitrator and establisher of norms, principles,⁴⁵ and rules.

The second major organ of the overall Authority is the Council. The Council will function as the day-to-day decision-making body of the seabed system, and will have a diverse representation as follows:

Four members from Consuming Countries (Consumers of Seabed Minerals)	4
Four members from Mining (Seabed) Countries	4
Four members from Mining (Land) Countries	4
Six members from Developing Countries	6
Eighteen members chosen to ensure Geographical Representation	18
Total	36

⁴⁵LOS, Articles 155-160, pp. 74-78.

It is difficult to say exactly which countries will fall into what categories, although they are not mutually exclusive. In other words, the U.S. could qualify for a seat under the "consuming countries" provisions or under "mining (seabed)" section. Naturally, a country can only hold a single seat at once. There are also provisions that guarantee seats to the Soviet block countries and land-locked/geographically disadvantaged countries.

In fact, the specifications are vague enough to raise key concerns within the U.S. delegation as to the likelihood of the U.S. being denied a seat on the council. It is, of course, important to note that the U.S. has always been afforded considerations within the U.N. system that would indicate continued influence on the council. There is, however, no specific statute guarantee that the U.S. will have a seat on the council, although the odds strongly favor it. An additional concern for the industrial countries is that the Council may well be dominated by developing countries, a turn of events which would give the Group of 77 a powerful tool for further directing the

46

world's ocean regime. The powers of the Council include placement of the officers of the Enterprise, the commercial mining arm of the Authority, overseeing the operation of the Enterprise, selection of seabed mining candidates, control over the resources of the Area through the granting of licenses, power to mandate technology transfer, appointment of inspectors for marine mining and exploitation arrangements. Overall, it is the Council that will make the day-to-day decisions presumably in accordance with the principles, rules, and norms established by the Authority.

Two other organs of the Authority are the Secretariat and the Enterprise. The Secretariat will function in a similar manner to the U.N. Secretariat, as an international civil service dedicated to the smooth running of the Authority, again with the "common heritage" principle foremost. The Enterprise will be, in effect, a commercial mining company operating under a parallel system with private corporations. The parallel system entails the following basic sequence: A private corporation researches and stakes a claim on the high seas deep seabed. The

⁴⁶This is reflected in many of the speeches given by Reagan Administration Officials. See, for example, Edwin Meese in the New York Times, Ambassador James Malone in testimony, and the President's January, 1982 speech, as noted in the bibliography.

Enterprise enters the picture when the private company stakes the claim and receives half (the parallel operation) of the tract to exploit. It is not a joint venture system in any sense. The Enterprise can also ask for and indeed force the transfer of mining technology from its private competitor, if such technology is not available on the market. Both the private corporation and the Enterprise will then mine the Area, side-by-side. The proceeds from such Enterprise operations will go toward the operation of the Authority, and will further be distributed to the developing and land-locked states, in order to enable them to participate in future deep seabed mining operations.

Clearly, the parallel system of mining operation, which gives equal ('parallel') access to less developed and land-locked/geographically disadvantaged states, is the ultimate embodiment of the "common heritage principle." Equally clearly, its acceptance by the vast majority of countries indicates a fundamental shift away from the liberal "freedom of the seas" regime to the more collective concept of the "common heritage of all mankind."

III. The Political Economy of the Emerging Ocean Regime

A. Introduction

In order to fully appreciate and analyze the specific marine technology transfer aspects of the Law of the Sea treaty, it is first necessary to discuss the more general political economy of the emerging ocean regime. The Treaty and its provisions, of course, are a major indication of trends within the overall ocean regime, and in this section of the dissertation, some of the basic precepts of regime analysis will be applied in order to sort out the important emergent trends.¹

Clearly, a new regime of the oceans is emerging. Thus far it has been a difficult birth, attended by acrimonious debate and much highly politicized rhetoric. In order to understand and analyze the new regime, it is helpful to apply some structural techniques and models to the analysis. The emphasis in this section of the dissertation will be on the political and economic forces that were

¹Much of the structure of this analysis draws upon the format developed by Keohane and Nye, Power and Interdependence (Boston: Little, Brown, and Co., 1978).

wielded by a variety of actors in the process of shaping the new ocean regime.

During the long negotiations over the Law of the Sea Treaty, there were significant shifts in the relations of the actors to each other, the goals of the actors, the instruments of policy and power, the agenda advanced, the issues considered critical, and the role of various international organizations. Each of these will be considered in turn.

Particularly important in analyzing the new regime are the substantially new principles and norms that have emerged in the course of negotiating the new Law of the Sea Treaty. As discussed in earlier sections of the this dissertation, the dynamic that has cut across all others in the law of the sea arena is the conflict between the more traditional concept of an "open ocean" and the newer concept of the deep seabed constituting the "common heritage of mankind." The United States and many of the leading Western industrial and military powers oppose the Treaty's emphasis on the "common heritage" principle and continue to support an ocean regime based largely on the

"freedom of the high seas." The developing countries, on the other hand, are solidly behind the new Treaty, which they feel represents a legitimate international shift toward the "common heritage" concept. The struggle is one aspect of a larger conflict between the developing world and the developed world over resources and distribution of global wealth. Indeed, many of the concerns that are addressed in the New International Economic Order (NIEO) are present in the Law of the Sea Treaty. The NIEO, of course, is a U.N. sponsored initiative to change the world's economic system in order to make it more responsive to the developing world's problems and concerns. Many other issues, of course, are bound up in the Treaty---such maritime concerns as navigation rights, passage through strategic straits, fishing rights, land-locked state's rights, formation of the Exclusive Economic Zone, and technology transfer, to name a few. Overall, it is important to bear in mind both the political-economic and the overall maritime character of the Treaty in approaching this analysis.

In this examination of marine technology transfer's

role in the Treaty and the larger ocean regime, it is critical to proceed from a well founded general basis for understanding the internal dynamics of the regime. Thus, this chapter will be divided into five key sections for analysis: Goals of actors, instruments of policy, agenda formation, linkage of issues, and role of international organizations. By considering their interaction in the formation of the new regime, as well as the structure of the regime itself, it is hoped that some valuable insights into the main issue of technology transfer will ultimately be reached.

B. International Regime Analysis

One of the best broad definitions of international regimes is given by Stephen Krasner:²

"International regimes are defined as principles, norms, rules, and decision-making procedures around which actor expectations converge in a given issue area." The elements may be either implicit or explicit, and Krasner goes on to define each of the elements further:³

1. Principles: Beliefs of fact, causation, and rectitude.
2. Norms: Standards of behavior defined in terms of rights and obligations.
3. Rules: Specific prescriptions or proscriptions for action.
4. Decision-Making Procedures: Prevailing practices for making and implementing collective choice.

In the Law of the Sea context, the principles of the

²Stephen Krasner, "Structural Causes and Regime Consequences, International Organizations, Volume 36, Number 2, Spring, 1982, p. 185.

³Ibid., p. 186.

overall regime include the concept of the "common heritage," the primacy of negotiation in establishing an equitable and efficient world order, and the need for an overall scheme of ocean management. The norms of the regime include such standards as the use of consensus negotiation, the right of each state to an equal vote on all issues, the need for peaceful settlement of disputes, and so on. Some examples of rules within the regime include specific prohibitions on the disposal of toxins in the ocean, rules of conducting scientific research, deep seabed mining, and the like, specific prescriptions for controlling sea lanes, etc. Finally, decision-making procedures are established in great detail, including the Council, the Assembly, the various administrative and technical bodies, and so on. Overall, the new ocean regime fits well into the Krasner definition of a regime. Additionally, several sub-regimes (smaller, complete regimes within an overall larger regime) are established by the Treaty. Some of these include the regimes for passage, management of territorial waters, technology transfer, and the like. Krasner further points out that "Changes in

rules and decision-making procedures are changes within regimes;" while "Changes in principles and norms are changes of the regime itself."⁴ This is a critical distinction, particularly when analyzing the forces that cause changes in given regimes.

Another important interpretation of regimes, and more specifically, of regime dynamics, is offered by Oran Young, who commented, "Regimes are social institutions governing the actions of those interested in specifi⁵able activities (or accepted sets of activities)."⁵ In discussing regime formation, Young describes three basic types of order:⁶

1. Spontaneous Order: Regimes that are the product of the action of many men but . . .not the result of human design."⁷

2. Negotiated Orders: Regimes that are "characterized by conscious efforts to agree on their major provisions, explicit consent on the part of individual participants, and formal expressions of the result." A multilateral treaty, such as the Law of the Sea Treaty, fits this type of regime.

3. Imposed Orders: Regimes that are "fostered

⁴Ibid., pp. 187-188.

⁵Oran Young, "Regime Dynamics," International Organizations, Volume 36, Number 2, Spring, 1982, p. 277.

⁶Ibid., pp. 282-285.

⁷Ibid., p. 282.

deliberately by dominant powers or consortia or dominant actors," i.e. by conquest, either politically, economically or militarily.

In expressing the methods by which regimes change,⁸
Young uncovered three major dynamics:

1. Internal Contradictions: Differences within the regime that take the form of "irreconcilable conflicts between the central elements of a regime." The fatal internal flaw is no less characteristic of regimes than of men.

2. Shifts in the Underlying Structure of Power: As Young points out, all three types of orders do reflect the realities of power that caused their formation. If that underlying power structure changes, the regime is bound to change as well.⁹

3. Exogenous Forces: "Societal developments external to the specific regime may lead to alterations in human behavior that undermine the essential elements of a regime."¹⁰

In our examination of the Law of the Sea Treaty and the specific sub-regime of technology transfer, the impact

⁸Young, "Regime Dynamics," p. 291.

⁹Ibid., pp. 292-293.

¹⁰Ibid., p. 294.

of all three types of regime change will be seen as the ocean regime is negotiated.

One well known analysts of world regime formation and change is Robert O. Keohane. In writing on the demand for international regimes, he points out, "Actors in world politics may seek to reduce conflicts of interest and risk by coordinating their behavior."¹¹ While recognizing this as the "supply side" of the explanation for the origin of regimes, Keohane goes on to point out the importance of what he terms the "demand side" of the problem---the "lack of a clear legal framework establishing liability for actions (i.e. sanctions); information imperfections; and positive transaction costs."¹²

By combining the demand and supply sides of the argument concerning international regimes, Keohane concludes that it is very likely that the demand for international regimes will be in part a function of the effectiveness of the regimes themselves in developing norms of generalized commitment and in providing high-quality information to policy-makers."¹³

Together with Joseph Nye, Keohane earlier developed

¹¹Robert O. Keohane, "The Demand for International Regimes," International Organizations, Volume 36, Number 2, Spring, 1982, p. 332.

¹²Ibid., p. 338.

¹³Ibid., p. 354.

theoretical approaches to regimes in Power and Interdependence. The primary hypothesis of the book was the development of the concept of "complex interdependence" as an explanation for the interaction of the state actors in the overall global regime. The complex interdependence model for analyzing the global political situation was developed in contrast to the more conventional realist model. The realist model, of course, takes as its central premises that: (Drawing from Hans Morgenthau)

1. Political relationships are governed by objective rules deeply rooted in human nature;
2. Interest is almost always defined in terms of power;
3. Power equals national interest equals national survival;
4. Moral principles are always overtaken by concerns of national interest;
5. The Political sphere is essentially autonomous.

Keohane and Nye, on the other hand, maintained that the complex interdependence model "sometimes comes closer to reality than does realism."¹⁴ In applying the model to

¹⁴Keohane and Nye, Power and Interdependence, p. 24.

real-world global regimes, they discuss three "characteristics", which are in effect assumptions about the actual world:¹⁵

1. Multiple Channels: More than a single means of communication (i.e. government to government) is available to actors. This might include contacts between trans-national groups, the influence of media contacts, cultural exchanges, action between various levels of the government bureaucracy, and so on.

2. Absence of Hierarchy Among Issues: There is no single overriding issue, such as military security, as there would be under the realist approach to international relations and regimes. Issues are blurred, and different groups within the individual state-actors will advocate various issues as priorities, effectively shifting the agenda at crucial times.

3. Military Force is Not Used by Governments Toward Other Governments: This represents the greatest "leap of faith" by Keohane and Nye in applying their concept of complex interdependence to real-world regimes. In the real world, force is often used by governments, a fact well

¹⁵

Ibid., pp. 24-25.

known to Keohane and Nye---their argument is that if the regime in question does not use force as a tool (military force, that is), then complex interdependence might be a good explanatory theory to analyze the system.

Keohane and Nye distinguish five aspects of the political process that serve to identify the type of regime under study: goals of actors (and, implicitly, types of actors); instruments of state policy, agenda formation, linkages of issues, and roles of international
¹⁶ organizations. By identifying the various processes in the regime under study, it is possible to place it on a scale somewhere between the "ideal types" of pure realism and complex interdependence. As the authors point out, "Most situations will fall somewhere between these two
¹⁷ extremes."

Keohane and Nye, Young, and many other commentators on the role of regimes in the global community use the example of the ocean regime in discussing international regimes per se. This is a logical choice, particularly for the writer who desires an example that will "fit" more easily within theories of a "global community" orientation. The regime

¹⁶Ibid., Table 2.1, p. 37.

¹⁷Ibid., p. 24.

of the oceans represents a strong example of a non-zero sum game---as a general matter, it is in the interests of almost all states to have a negotiated fair, and equitable ocean regime. This is because the ocean is a shared good, at least by the majority of states that have coastlines. Even land-locked and geographically disadvantaged states can profit from an ocean regime that affords them some rights of exploitation. Resources, both living and non-living, can be harvested from the ocean in such abundance that the key good in the equation is not the resource---it is the regime that permits orderly exploitation that becomes of overall value to the global community. The sea can be more efficiently and equitably exploited by mankind under a legally constituted regime. There are therefore strong arguments to be made for the logical and reasonable evolution of an ocean regime, although logic and reason do not always prevail in the international arena.

Having recognized the logical and reasonable underpinning to the concept of an ocean regime, analysts of political and economic factors in international relations will often use the ocean regime as an example of the

movement of human society toward "collective law making" and "derived legal norms representing the collective will of the global community," to quote Roberto Unger.¹⁸ As an example, the oceans are an excellent choice to illustrate precisely that point, although, as will be discussed below, ocean regimes are hardly a "new" arrangement. Perhaps it is, as Professor Benjamin Cohen of The Fletcher School of Law and Diplomacy points out, "the articulation of the regime that represents the advance."¹⁹ At any rate, commentators continue to point to the ocean regime as an example of a "good regime," since it affords an example of states attempting to work together (more or less) for the common good.

A second reason for the frequent analysis of ocean regimes, at least in the modern era, is their dynamic character. The regime has changed, both within itself (changes in rules and decision-making procedures) and in fundamental character (changes in principles and norms).²⁰ Such changes have occurred quite frequently over recent decades, with several distinct regimes and many changes within regimes even since 1958.²¹ This has afforded

¹⁸Professor Roberto Unger, Harvard Law School, Lecture, Cambridge, MA, January, 1982.

¹⁹Professor Benjamin Cohen, The Fletcher School, Comment, Medford, MA, April, 1983.

²⁰Krasner, "Structural Causes," p. 187.

²¹Keohane and Nye, Power and Interdependence.

analysts with much recent material and well-documented, unclassified sources.

A third reason for the continuing interest in ocean regimes as an example of global regime formation is the totality of participation. Virtually every country in the world, and many "liberation organizations," trust territories, and international organizations have participated in the most recent LOS Conference. Writers and analysts can use a wide sample of state-actors, some with open and well-run archives, to research the changing pattern of global interaction.

Finally, and most importantly, the attractiveness of studying ocean regimes rests on the nature of the structures. As will be examined in depth below, the struggle of political and economic forces to create a new ocean regime is at the cutting edge of the conflicts that will fill the next century---resource control. The Treaty is an allocative device for the resources contained in some 71% of the world, including mineral, protein, hydrocarbon and other sources of wealth. The specific subject of this dissertation, marine technology, is but one form of wealth

that the Treaty presents some control over. It is not original to point out that resources are dwindling and the world population is increasing. While not so catastrophic a situation as was thought a decade ago (or by Malthus in the 18th Century), it is certainly a problem which will continue to command much attention. In many ways, of course, it is anything but a new problem---yet the ocean aspect of resource control is a relatively recent wrinkle.

Ocean regimes will control a major part of the world's resources in the next century. Obviously, as land-based resources are used up, the resources that remain under the oceans will represent an increasing percentage of the global supply. The political and economic forces that combine to form the regime of the oceans will determine the shape of that regime. It becomes incumbent upon any serious policy-planner, strategist, or analyst of international relations to fully understand the nature of the emerging ocean regime. It is important not only for predicting future trends in international relations, but also for understanding the nature of the global arena

today. It is no exaggeration to say that the regime of the oceans and some of the specific issues within it (such as marine technology transfer) are among the most important facing national planners. The issues involved offer an insight into the present state of world affairs and affords some predictive power in understanding which way power and wealth are flowing. In effect, the Law of the Sea negotiations are a kind of options market, providing the market opinion (based on one of the few global samples of state actors available) of who is really driving events, and who is truly driven.

C. Goals of Actors

The first level of analysis in understanding the emerging regime of the oceans is the study of the negotiating groups and their goals during the process of establishing the Treaty. In any group, dynamics are complicated, particularly when the subject under negotiation is vital to the national interests of the state actors concerned. Additionally, the groups in the UNCLOS III negotiations were not mutually exclusive sets---that is, the membership overlapped through several major and minor groups. Finally, the groups were not consistent, in that a given actor's expectations and goals might have changed over the course of the ten year negotiation project, resulting in group goal shifts as well as individual actor shifts. It follows, therefore, that much of the information available for group goal analysis is likely to be incomplete or confusing.

Still, some overall trends are discernable from the shifting allegiances of the various actors that do give the

analyst some insight into the process of negotiation and the final Treaty product as well.

The first distinction to be made in distinguishing among the actors at the Law of the Sea talks is between states and non-states. Countries are referred to in the text of the Treaty as "States Parties" and are simply those national entities signatory to the Convention. Basically, states were the principal negotiators, since only countries could actually participate as voting members during the negotiations.²² Besides the principal negotiators, there were several groups that exerted influence of an indirect sort on the course of negotiations, generally through governments. These actors included multinational corporations, national liberation movements (SWAPO, PLO, etc.), diplomats and functionaries of the U.N. Secretariat, other international organizations, and some trans-national organizations (ecological groups, scientific associations, etc.). These actors can be referred to collectively as non-state actors. Both types of groups (state and non-state) had significant goals and worked within negotiating groups (either directly or through governments) to

²²LOS, Part XVIII, Article 305, p. 149.

influence the final outcome of the ocean regime negotiations.

State Actors

One of the key features of the Conference was the influence of informal negotiating groups (INGs). These were groups of delegates to the Conference who would meet regularly to discuss mutual interests in certain issue areas. The ING²³s ranged from very large organizations, such as the Group of 77 (developing Nations) to very small collections of delegates, such as the Archipelagic States Group (island nations like Indonesia, Malaysia, the Philippines, with interests in a narrow range of issues). Membership in the various ING²⁴s overlapped, as did the interests and relative priority of issues. Some of the groups were very influential in obtaining their desired ends, while other groups were ineffective. The ING²⁴s can be further subdivided into external and internal groups.

²³The G-77 (Group of 77), actually has over 120 members enlisted under its negotiating "umbrella."

²⁴Barry Buzan, "United We Stand---Informal Negotiating Groups at UNCLOS III," Marine Policy, July, 1982, pp. 184-187.

External Groups were INGs that had been in existence before the Law of the Sea negotiations, comprised members with interests in common external to the LOS discussions, and were generally less effective in implementing policy at the Conference. Some examples include:

- European Community
- Soviet and East European
- Western European and Others
- Latin American
- African
- Asian
- Arab
- Islamic
- Group of 77
- Commonwealth
- Non-Aligned

Internal groups, on the other hand, were formed in the heat of the Conference, and generally coalesced around very specific issue-oriented questions where groups of delegates felt that concerted effort would enable more effective outcomes for the particular actors. Some internal groups²⁵ included:

- Land-locked and Geographically Disadvantaged
- Coastal
- Archipelagic
- Territorial Sea
- Straits
- Technology Transfer

²⁵Edward Miles, "The Structure and Effects of the Decision Process in the Seabed Committee," International Organizations, Volume 31, Number 2, 1977, pp. 159-234.

Parallel System Deep Seabed Mining
Coastal Fishing
Distant Water Fishing
Marine Scientific Research
Environmental

(Note: While it is generally true that the external groups were less effective than the internal groups, there were exceptions---the G-77 was a very successful external group, while the Technology Transfer group was an unsuccessful internal group.)

As a part of the INGs, but really as a third type of negotiating group, "Compromise Groups" must be mentioned. These were collections of delegates who met in order to try and "iron out" a difficult specific problem or deadlock that arose in the course of the negotiation. They were generally called into being by either the Conference leadership or one of the issue-oriented INGs in order to try and move off dead center on a given problem. These groups were able to effectively undertake "damage control operations" that could prevent the negotiations from breaking down altogether. They were also able to help move the discussion in new directions on occasion.

In order to analyze the effects of the various actors

and their success in implementing their respective goals,²⁶
 it is necessary to examine some of the INGs more closely:

Latin American Group: This ING included the 20 Latin American countries, as well as 8 nations from the Hispanic Caribbean. The history of countries in the Latin American region was one of strong participation in international conferences, especially in maritime areas. The Latin American countries were the first to declare the 200 mile Exclusive Economic Zone as their primary interest at the Conference, as many of the member countries derive considerable revenue from fishing and offshore activity. Interestingly, two of the members were land-locked (Bolivia & Paraguay), and used their overlapping membership in the Latin American Group (external) and the land-locked & geographically disadvantaged group (internal) to good effect in lobbying for their preferred outcome. The Group's overall desires included offshore exploitation rights, a large EEZ, limits on distant water fishing rights, and a strong Enterprise/ISA. The most influential members of the group included Peru, Brazil, and Mexico. Chile's influence diminished after a coup in 1973, an

²⁶ Ibid.

example of internal crisis affecting a country's external ability to pursue national goals. The group was very successful in achieving its primary goals, which also included establishment of the International Seabed Authority in either Latin America or the Caribbean. (It is to be headquartered in Jamaica.)

African Group: This was the largest regional ING in the Conference (with 47 members) and it had strong organization and leadership. Thirteen of this group's members were land-locked, however, and the tendency for obstruction and lack of cohesion was great, although generally manageable. The primary goal of the African group was the achievement of a strong global Authority (ISA) that would be able to mandate technology transfer and help the developing countries. The African Group constituted the largest voting block in the Group of 77.

Asian Group: This was the least organized of the regional groups at the LOS Conference, and they achieved the least. The ING was composed of 41 members, with 7 being either fully or functionally land-locked. Some of the individual countries were influential (Japan, the

Philippines, Fiji, and Sri Lanka), but as a group, the Asian concerns were so diverse (ranging from highly industrialized Japan seeking free mining and distant fleet-fishing to the very parochial concerns of Fiji at the other end of the ideological spectrum) that little impact was made by the group as a whole.

Group of 77: The single most influential group at the Conference was the G-77. With nearly all of its 120 members engaged in the LOS talks, the Group of 77 subsumed virtually the entire Latin, Asian, and African Groups. While it is dangerous and misleading to categorize the LOS negotiation as a fight to the death between the industrialized North (OECD Group) and the Group of 77 (representing the South), it is important to recognize that the conflict between those two groups was one of the primary dynamics in the Conference. Even given the wide range of issue goals held by the member states of G-77, they were able to drive the conference on very broad principles that ultimately were in line with developing state's goals. These included:

1. Acceptance of the "Common Heritage" over the

²⁷ Bernardo Zuleto, "The Law of the Sea," Oceanus, Fall, 1982, pp. 28-30.

"Freedom of the Seas" as the primary norm associated with the ocean resources of the deep seabed.

2. Establishment of the International Seabed Authority, located in a developing country, with heavy LDC membership in its controlling Council, with powers of mandatory technology transfer.

3. Recognition of the needs and interests of developing countries in general, and the land-locked and geographically disadvantaged developing states in particular.

4. Protection from industrial countries' distant fishing fleets operating unchecked in developing country areas.

5. Recognition of at least a 12 mile territorial sea, with the coastal state exercising some control over straits passage and activities in the contiguous zone beyond the territorial sea.

The G-77 was able to achieve the first two goals fully, the third and fourth partially, and gave some ground (in terms of navigational rights) on the fifth. Overall, it was a successful performance, although the long term

consequences (an ocean regime not supported by some of the primary maritime powers) may be ultimately counter-productive to the needs of the Group. This will be analyzed in some depth below.

Eastern European/Soviet Group: The traditional block cohesion was maintained without difficulty, particularly since only the U.S.S.R. and Poland had significant goals in the LOS process. The Soviets wanted protection for distant fishing fleets, secure global transit for their Navy, and also attempted to convert the North-South conflict into political capital. The Poles were concerned over their distant fishing fleets, an important source of foreign exchange for them. The Soviets were also strongly in favor of provisions in the Treaty that would allow their major naval forces unimpeded transit through various strategic straits, a position they held consistently throughout the Conference.

Western European and Others (OECD): This group was not geographic in nature, as it contained the democratic European countries, the U.S. and Canada, Australia, New Zealand, and Japan---the OECD countries. Although its

members tended to overlap in several other groups (Japan in the Asian, Anzus countries in the Commonwealth group, etc.), the OECD group tried to present a cohesive front. Its goals, however, were scattered. Australia, New Zealand, and Canada, for example, formed a sub-group that was usually closer to the G-77 than to the rest of the industrial countries. This was not suprising given the relatively non-industrial character of Australia, New Zealand, and Canada's economies which all depend to some degree on mining (nickel, copper, etc.) as a major source of revenue. The United States worked with the OECD group, but had strategic interests that often overcame political and economic concerns, such as the issue of maintaining open straits passage for warships. Overall, the goals of the group might be said to have included (although there were frequent exceptions):

1. Maintenance of "Freedom of the Seas" as the primary norm of the ocean regime.
2. A Sub-Regime for Deep Seabed Mining that was regulated by a very weak international organization, without any powers over access, mining applications or

technology---essentially a "frontier office" where claims could be "staked."

3. Open passage through all major strategic and commercial straits, without any control by coastal states.

4. Strong rights for distant fleet fishing.

5. Limited international control over most aspects of the marine environment including pollution, scientific research, artificial island construction, etc.

Essentially, freedom to exploit the environment with a minimum of interference and regulation.

Ultimately, the industrial countries were the losers in the LOS negotiations, at least when objectives and outcomes are compared. With regard to the deep seabed, the "freedom of the seas" principle took a severe beating, and has been replaced (within the Treaty, at least) by the "common heritage" principle. The Authority and all its organs have a well defined legal control of the deep seabed, and within the Authority, the developing countries have an excellent possibility of wielding a wide range of powers. The institution of straits passage and the fairly narrow (12 mile) territorial sea were victories for the

industrial countries although not overwhelming ones. The Treaty is strong and well-armed (at least as compared with most other international regimes) with numerous sanctioning and enforcement powers to support it.

On the positive side, from the point of view of the industrial world, it seems there is a certain benefit in simply having the Treaty. This flows from the need for a legal regime to obtain financing and insurance for deep seabed mining operations, which might have been denied by major banking and insurance firms in the west without some sort of formal regime. There is divided opinion on the issue of whether or not the legal regime will be a necessity for Western miners to operate on the deep seabed. The President's advisor, Edwin Meese III had commented, "to sign it (the Treaty) would have undermined the future national and economic security of the U.S. and many of its allies."²⁸ Many other observers, on the other hand, including such figures as Elliot Richardson, Cyrus Vance, and Henry Kissinger, have all advocated signing the Treaty. From a political standpoint, there are benefits to the West in signing the Treaty. These are related to the desire to

²⁸ Edwin Meese, "Seabed? No, Bed of Nails," New York Times, February 21, 1983, p. A17.

work toward a better world environment with increased equity for the developing world, a position advocated by some in the West. Clifton E. Curtis recently wrote, in support of the Treaty, "The oceans are more than another market to be cornered"²⁹

It is important to note, before turning to the goals of some specific national actors, that for the industrial capitalist countries, the Treaty does represent potentially dangerous collective economic philosophy, at least according to many within the Reagan, Thatcher, and Kohl administrations. James Malone, the U.S. Ambassador to the final LOS Conference in 1982 commented recently, "It is (the Treaty) a document which, hiding behind the mask of superficially appealing slogans like "NIEO" and "the common heritage of all mankind," promotes a thinly disguised³⁰ collectivism."

Individual State Goals

Not all of the states at the LOS Conference had individual and specific state goals. Some were too small,

²⁹Clifton E. Curtis, "Sign the Sea-Law Treaty," New York Times, February 21, 1983, p. A17.

³⁰Ambassador James Malone, Interview, Washington, D.C., June, 1983.

basically uninterested, had a tiny or nonexistent maritime sector in their country or lacked sufficient internal cohesion to mobilize effectively. Most states did have goals, however, and worked to achieve them through the groups above. A small number of states had very specific goals they were working toward and maneuvered both singly and through their group affiliations to achieve their goals. A few of these major actors bear a quick³¹ analysis:

United States of America: The issue-goals of the United States are difficult to prioritize within the overall LOS framework. For example, from a purely strategic-military standpoint, the U.S. desired maximum freedom of straits passage for its warships and commercial shipping. The Treaty "raises crucial questions regarding our future naval and air mobility," wrote one Department of Defense analyst.³² From a business and commercial standpoint, on the other hand, the deep seabed sub-regime is the top priority---in order to control production, ensure a steady flow of strategic minerals, and exploit the

³¹Material in this section comes from a variety of sources, including primarily interviews with delegates.

³²Dennis R. Neutze, "Whose Law of the Sea?", Naval Institute Proceedings, January, 1983, p. 43.

deep seabed, the U.S. should oppose a restrictive and collective global ocean regime. Another approach would be to give top priority to the U.S. self-avowed mission to work for global peace and security in a framework that allows peaceful co-existence---this would probably make the leading issue-goal the production of an acceptable ocean regime that reflects the true sentiments of the international community.

The situation for the U.S. was complicated (as it is for most democratic governments) by changes in administrations during the long negotiating process. The Nixon/Ford administration, under the influence of Henry Kissinger and Elliot Richardson, was very innovating and indeed a leader in the Conference. It was Kissinger who proposed the "parallel system" of mining and broke the first major deadlock in the Conference between the industrial countries and the G-77. During the Carter administration, support for the Treaty was strong in the executive branch. Elliot Richardson, appointed Ambassador³³ to UNCLOS III under Carter, commented,"

³³ Elliot Richardson, San Diego Law Review, Volume 18, Number 3, April, 1982, pp. 493-494.

"The resources (of the deep seabed) belong to the world and . . . nobody has any right of access to them until and unless they gain that right of access pursuant to an international agreement and under a body thereby established."

Under the more conservative and free-market oriented Reagan administration, the U.S. executed a sudden volte-face and rejected the Treaty. President Reagan cited six major problems with the accord as it stood in 1982:³⁴

1. The Treaty deterred development of the deep seabed (A reference to the pervasive influence, control, and power of the ISA.)

2. The Authority might be able to monopolize the resources and prevent access to them by the U.S. and other countries for political reasons.

3. Decision-making roles in the deep seabed sub-regime were biased against the contributing countries (Like the U.N., the ISA will be supported by contribution by member-states based on their economic size---at least until the revenues from seabed mining begin to make the organization self-sustaining)

4. Amendments to the Convention could be passed by the Assembly by a three-fourths majority, and the

³⁴Ronald Reagan, Presidential Statement, 20 January, 1982, p. 1.

signatories would then be bound by the new changes. President Reagan commented that this section of the Treaty was in effect un-constitutional for the U.S., since it abrogated the right of the Senate to advise and consent to any changes in a Treaty.

5. The Treaty set undesirable precedents for other "international organizations," i.e. was too powerful and collective in its structure.

6. Technology transfer was too sweeping (i.e. mandatory) in character, which would make it difficult for the Treaty to pass the U.S. Senate.

Overall, the basic argument for the U.S. signing the Treaty is two fold: First it represents a fulfillment of a traditional U.S. goal (at least a traditional 20th Century U.S. goal) of a move toward a peaceful, orderly, stable world community. Second, the Treaty does provide strategic concessions important for U.S. global maritime interests, including warship passage, commercial tanker and containership transit, overflight and sea control. Sea control is a technical naval term implying the right to move warships at sea freely in order to maintain military

naval force on selected shipping lanes of communication.

The arguments against the Treaty from the U.S. standpoint are: It is a political and economic weapon directed against the industrial world by the developing world; it supports fully redistributing some portion of global wealth, in line with the concepts espoused by the NIEO; it institutionalizes a global collective as the controlling medium for the deep seabed portion of the ocean regime; and it gives strong political power to an organization controlled by developing country interests, which generally run counter to industrial concerns, at least in the economic sphere.

The prospects for signature under the Reagan administration are non-existent. Many observers feel that even if a new administration signed the Treaty, it would never pass the U.S. Senate. Senator Russell Long summarized the attitude of many Senators toward the Treaty as:

"U.S. citizens are to pay all of these millions of dollars to an international organization for rights they presently enjoy at no cost under the well-recognized

³⁵Russell Long, San Diego Law Review, Volume 19, Number 3, p. 495.

International Law doctrine of the Freedom of the High Seas."

Senators John Glenn of Ohio and Gary Hart of Colorado both echoed the thought that the Treaty would not pass the U.S. Senate in recent letters.³⁶

U.S.S.R.: The Soviet Union had several important goals in the LOS process. First, as a leading maritime and naval power, the Russians were interested in maintaining rights of passage through major international straits, an objective which put them on the side of the U.S. in many negotiating situations. Second, as a major distant-water fishing power, the Soviets were interested in developing the rights of access to many traditional and historical fishing grounds in what would now be the EEZ areas of the world's oceans. Third, and perhaps most importantly, the Soviets sensed an opportunity to encourage the anti-western sentiment that the economic and deep seabed sections of the Treaty seemed to be producing. They are not in a position to be dependent on strategic resources from the deep seabed (since they produce virtually all the manganese, cobalt,

³⁶ Senator John Glenn, Letter, June, 1983; Senator Gary Hart, Letter, July, 1983.

copper, and nickel for themselves and their allies). As a result, they were able to achieve most of their goals without giving any ground during the Conference, assisted by the fact that little internal lobbying pressure existed on their negotiators given the realities of the Soviet domestic political process.

³⁷
France: France's traditionally strong attachments to many post-colonial, developing countries led her to differ with other Western powers in certain key areas of the Treaty. According to the Chief Delegate, Claude Chayet, the French were quite satisfied with the deep seabed mining provisions, and fully supported the Authority concept in theory and practice. As a strategic nuclear power with a large Navy (fourth largest in the world ³⁸) the French remained concerned with straits passage, but not to the extent of losing political ground with the developing world.

³⁹
West Germany: One of the leading countries in development of deep seabed mining technology is West Germany. Since the Germans lack significant Naval forces, they are less concerned with straits passage than other

³⁷United Nations Document, SEA/470, 31 March 1982, p. 12.

³⁸J. Couhat, Combat Fleets of the World (Annapolis: Naval Institute Press, 1980), p. 91.

³⁹United Nations Document, SEA/470, 31 March 1982, p. 9.

Western powers such as the U.S. or the U.K.. Their national goals have thus tended to be focused around maximizing the opportunity to mine deep seabed minerals as soon and as freely as possible. The Germans, however, were ultimately satisfied with the deep seabed mining provisions, according to the West German Chief Delegate,⁴⁰ Hans Lautenschlager. The German primary concern was for some form of workable regime that would allow mining to begin. The Germans were particularly concerned about the possibility that Western banks and insurance companies would decline to invest or insure commercial mining operations without a viable, legal regime of the oceans.

Great Britain: The conservative Thatcher government in England has been in step with the Reagan Administration on many global issues, and the Law of the Sea proved no exception. Britain's strategic concerns, with the second largest Navy in the free world, coupled with a strong free-market orientation toward mining operations combined to produce consistent British opposition to the Treaty along the same lines as the United States. The British have declined to sign or ratify the Treaty, and may well join

⁴⁰United Nations Document, SEA/470, p. 7.

the U.S. as long-term hold-outs from the new regime.

Australia, New Zealand, and Canada: These three countries, although nominally a part of the OECD and the Western industrial group, sided consistently with the developing countries. The major reason was economic---they are all producers of minerals that will ultimately be mined at sea, and thus have a joint interest with many developing countries that are also land-based producers. Australia has a huge, 350-mile continental shelf (most countries have about 200 miles at a maximum), and was thus very concerned about issues dealing with the EEZ and offshore exploitation. Keith G. Brennen, the Australian delegate, commented that Australia wanted to act as a bridge between the advanced and the developing countries.⁴¹ Australia, Canada, and New Zealand shared most goals, including the establishment of a workable regime to promote closer ocean relations between various global factions (and one that could incidently protect land-based producers from oversupply by deep seabed sources), strong rights of passage through the EEZs of coastal states, and protection of continental shelves for exploitation by the coastal

⁴¹Ibid.

state. The effectiveness of all three countries was based on their willingness to compromise and take a position between the hard-line Western industrial countries and the more liberal developing nations.⁴²

Non-State Actors

An increasing facet of international relations in recent years has been the importance and legal personality of non-state actors. In determining the underlying factors in the LOS negotiations, the influence and goals of two major groups of non-state actors must be taken into account---multinational corporations and other general international organizations.

MultiNational Corporations (MNCs)

The most important MNCs active in the LOS negotiations were the international consortia that had invested heavily in research and prototype building in deep seabed mining during the 1970s. These firms were very influential in

⁴² United Nations Document, SEA/462, 3 March 1983, p. 4.

encouraging the entire negotiation, since in order for them to obtain bank financing and insurance coverage for their expensive and risky deep seabed mining operations, they needed a legally constituted seabed regime of some sort. Naturally, their idea of an ideal deep seabed regime was a very minimalist one---in essence an office to stake claims on the deep seabed under the high seas and some kind of minor regulatory control over pollution and safety aspects of their operation. The idea of a full-blown ocean regime dominated by developing country interests anxious to participate fully in the exploitation of the "common heritage of mankind," was not in the MNCs' original vision, to say the least.

Four major consortia were deeply involved in deep seabed mining from its theoretical inception in the late 1960s. Their influence was magnified by their international character and the power of their component "parents." A quick glance at the make-up of the four major consortia confirms this:

INCO CONSORTIUM: (International Copper of Canada, AMR of Germany, Deep Ocean Mining Co. of Japan, SEDCO of the

⁴³Jane's Ocean Technology (London: Jane's Publishing Co., 1982), pp. 750-752.

U.S.A.) Each of the national groups are in fact consortia themselves, so the overall INCO group is comprised of over 50 companies from the four major industrial countries noted. The group has financed several research and prototype expeditions, and operates one full-blown mining ship, the SEDCO 445 out of Ontario, Canada.

KENNECOTT EXPLORATION: (Kennecott Copper Co. of the U.S.A., Rio Tinto Zinc of the U.K., B.P. Minerals of the U.K., Consolidated Gold Fields of the U.K., Mitsubishi International of Japan, and Noranda Mines, LTD. of Canada) A small group (compared to the other three), Kennecott Exploration has been engaged in research but in few full-scale, practical operations.

OCEAN MINERALS COMPANY: (Lockheed Missiles and Space Co. of the U.S.A., Billington B.V. and B.K.W. Ocean Minerals B.V. of the Netherlands, Amoco Minerals Co., of the U.S.A). The most active of the four major consortia, Ocean Minerals Company (OMCO) has operated a full scale prototype, two major mining vessels, and has patented the leading form of mining rig, a bottom crawler and pneumatic lift system. Like the rest of the industry, however, they

have slowed their operations of late. The U.S. decision not to sign the LOS treaty has created an uncertain atmosphere for mining, and the industry does not regard the Treaty as very viable. In a recent letter, Conrad Welling, the Vice President of OMCO, tersely explained the reasons⁴⁴ for objection to the Treaty by industry:

1. No assured access to the minerals (i.e. the companies have to apply for permission to mine from the Authority)

2. No sanctity of contract (the Authority can break agreements and dictate terms to the mining companies.

3. Production controls (instituted at the insistence of the major land producers of copper, nickel, cobalt, and manganese, the minerals found in the deep seabed nodules)

4. Forced transfer of technology (the Authority has the right to mandate transfer of any mining technology either to the Enterprise or to other competing companies from developing countries if such technology is not "available on the open market."

OCEAN MINING ASSOCIATES/DEEP SEA VENTURES: (Sun Oil of the U.S.A., Union Minere of Belgium, U.S. Steel of the

⁴⁴Conrad G. Welling, Vice President, OMCO, Letter, March, 1983, p. 2.

U.S.A., Tenneco of the U.S.A., Nichimen Co., C. Itoh, and Naematsu-Gosho of Japan) Ocean Mining Associates operates a single mining vessel and is the instigator of the first "claim" staked on the deep seabed in a letter to the then-Secretary of State, Henry Kissinger on 4 November 1974. The firm boldly claimed 60,000 square kilometers under the high seas of the Pacific. The company requested "protection" from the U.S. Government.⁴⁵ After consulting with its allies involved in mining (Canada, U.K., Japan, and others) the U.S. responded with a public statement:

"The Department of State does not grant or recognize exclusive mining rights to the mineral resources of an area of the seabed beyond the limits of national jurisdiction."⁴⁶

The issue continued through negotiations in the LOS for the next nine years, and ironically, the U.S. ultimately reversed its position, rejected the Treaty, and is now encouraging its deep seabed mining companies to "go it alone" under recently enacted U.S. deep seabed mining legislation.⁴⁷

Other Mining Entities: In addition to the big four,

⁴⁵ Department of State Talking Paper, July, 1977.

⁴⁶ Ibid.

⁴⁷ Ibid.

mentioned above, several countries have developed the rudimentary structure for conducting government-supported deep seabed mining. By far the most advanced are the national consortia sponsored by the governments of Japan and France. France's corporation, Association Francaise pour L'Etude et la Recherche des Nodules (AFERNOD) was formed in 1974 and has expended \$45 million in research to date. They are partially funded by the government, with the remainder of their capital from the private sector in France. The Japanese corporation, Deep Ocean Minerals Association (DOMA) was formed in 1974 as a public corporation, and has 41 major firms associated with it, including representatives from trading companies, mining and metallurgy concerns, shipping, cable, electric, fisheries, shipbuilding, and steel firms as well. They are formed into a loosely-knit joint-venture group under the overall direction of the government.

In addition to the quasi-organizations formed by the French and Japanese, India and the Soviet Union have also formed purely governmental deep seabed mining concerns. Little is known about either effort at this time, although

⁴⁸J.K. Amsbaugh, Ocean Mining Associates, "The Ocean's Contribution to the Solution of U.S. Strategic Mineral Crisis," Paper, American Metals Society, 22 September 1981.

both have applied for initial "claims" under the "pioneer
⁴⁹
 investors" clauses in the Treaty.

Influence of the Multinational Consortia

The influence of the MNCs has been economically driven, although it has been increased by the strategic nature of the minerals available from the deep seabed nodules. It has been estimated that a working deep seabed mining station could net and process 550 tons of ore per day (See Annex). The ore nodules contain significant amounts of manganese (25%) and smaller amounts (1-5%) of copper, nickel, and cobalt. The remainder of the nodules are formed of silicon, iron, and trace amounts of a wide variety of minerals and metals. Cobalt and manganese are considered strategic minerals due to their use in steel and jet engine construction. The U.S., for example, currently imports nearly all its manganese and cobalt, and over 70% of its nickel. This is true of Japan and most Western
⁵⁰
 European countries as well. The strategic character of the elements contained in the deep seabed nodules (which

⁴⁹ U.N. Document, LOS, Resolution II, p. 5.

⁵⁰ U.S. Department of Mines, Department of the Interior, "Copper," "Nickel," "Manganese," and "Cobalt," 1983.

are scattered over the floors of the ocean fairly evenly) gives a political-strategic overlay to the primarily economic debate over deep seabed mining. Many mineral deficient countries who also have major industrial-strategic uses for the seabed metals (such as the U.S. and its allies), end up favoring a "freedom of the high seas" concept over a "common heritage principle" because the former assures greater access to the deep seabed minerals.

Economically, the deep seabed minerals could provide for the expanding needs of the world's industrial base with great ease, even if operating from a very few (less than 100) mining stations over the next century. The quantities of the minerals available are enormous. Naturally, the mineral producing (land-based) countries are gravely concerned over what large-scale deep seabed mining could do to a principal source of their revenue, but this will be treated in depth later in the dissertation. From the standpoint of the MNCs, deep seabed mining offers an opportunity to supply an expanding industrial base with required minerals at a good profit. They are using economic-commercial arguments supplemented by political-

⁵¹Conrad G. Welling, Letter, 22 March 1983.

military reasoning, pointing to the balance of payments improvement, the new sources of jobs in domestic industries, and the strategic benefits of an assured source of minerals.⁵² These arguments are equally effective in most other allied Western industrial countries. The influence of the MNCs in the LOS debate was strong enough to function in a "spoiler" role. It was strong enough to induce some of the major industrial countries (U.S., West Germany, U.K.) to refrain from signing the Treaty, at least to date---but it was not strong enough to shape the Treaty to their (the MNCs) desired ends. The net result is a virtual stoppage in progress toward seabed mining. The firms with the technology will not mine (mainly due to poor markets, lack of financing, and the lack of a legal regime of the oceans). At the same time, they cannot live with the regime currently proposed. Caught between the proverbial rock and a hard place, they are debating the efficiency and risk of mining without a Treaty. For the U.S. based multinationals, the prospect of conducting operations outside the Treaty has improved as a result of the recent "Reagan Proclamation." This unilateral

⁵²Ibid.

declaration said, among other things, that the U.S. would look at deep seabed mining as a logical extension of the⁵³ "freedom of the high seas."

International Organizations

The final group of influential actors involved in the LOS process were international and transnational organizations. These included not only the U.N. and its organs, which sponsored the Conference, but also other maritime, environmental, and strategic organizations that attempted to influence the outcome of the LOS talks. Some of these, notably the environmental groups, were very successful in achieving their desired goals. This can be attributed to the fact that their goals more or less fell in line with greater international control over the environment, which falls in line with premise of the "common heritage" principle. In other words, if one accepts the entire oceans as a common heritage, it makes sense to formalize pollution and environmental control by

⁵³Ronald Reagan, Presidential Statement, 15 March 1983, p. 2.

states and organizations over the sea. The groups did most of their lobbying through the governments of the Western democracies and also by appealing directly to the more sympathetic delegations from the developing countries, with whom they were able to form effective alliances on occasion.

Additionally, any international organization can sign the convention, "if a majority of its States members" are "signatories to the convention."⁵⁴ The convention devotes a full Annex (IX) to the subject of interaction with other international organizations. This is understandable given the general influence over many international organizations that is exercised by developing countries, usually by virtue of their large (the LDCs) numbers. Most maritime international organizations (IMCO, IMO) are expected to eventually sign the convention in order to further establish their legal personality in the global community.

The most influential international organization was the United Nations itself. First it provided the forum for the talks, using its influence and infrastructure to bring the parties together and begin working from the four 1958

⁵⁴LOS, Annex IX, "Participation by International Organizations," pp. 218-220.

conventions as a starting point. Second, the U.N. offered a professional international civil service staff, in the form of the U.N. Secretariat, that could provide adequate administrative and organizational support for the decade long conference. Finally, the U.N. was able to draw on its many sub-organizations to provide information, expert advice, infrastructure, etc. It is difficult to imagine another organization or state that could have carried off the delicate balancing act that constituted the Conference.

The goals of the U.N. as an organization were somewhat complex during the negotiating project. The primary objective of the U.N. itself was to arrive at a global, multilateral agreement by the consensus method, i.e. without formal voting or any significant objection. This was considered key by the Conference leadership as a step toward creating a more effective global community. In this sense the Treaty was a failure. Not only was the Convention put to a final vote (at the request of the U.S.), it received 4 negative and 17 abstaining votes. Many of the opposing and abstaining votes were from major maritime powers. The drive for consensus failed at the

very end of the Conference process, although it was successful during the proceedings in resolving many disputes.

The secondary objective of the U.N. as an organization was met. This was to conclude some form of agreement that would further strengthen many of the basic driving principles of today's U.N.. Some of these included the New International Economic Order, technology transfer by legislative regulation, a concerted movement toward a more equitable distribution of the world's wealth, and the principle of the deep seabed (and other global commons) as the "common heritage of mankind." It was important for the U.N. to carry through these goals not only for their value in the LOS context, but for the high precedential value they represented. Many of these principles will remain controversial until more of the leading economic and political power actors in the global community sign or agree to them in Treaty form. In effect, the U.N. (as personified by the Conference leadership) traded off the primary objective for the secondary, hoping that the industrial countries currently abstaining will eventually

acquiesce to the Treaty and fulfill the first objective as well. Indeed, Ambassador Tommy T.B. Koh of Singapore, the last President of the Conference, commented at its conclusion, "I hope that those few delegates that voted against the Convention and which abstained on it will, after further reflection find it possible to support the Convention."⁵⁵ Having written a convention over the objections of some of the leading economic and political actors in the system, the U.N. leadership (and the developing world) are taking a gamble that such support will eventually be forthcoming.

⁵⁵ United Nations Documents, SEA/494, 30 April 1982, p. 2.

D. Instruments of Policy

In descending order of importance, the instruments of policy used in the Law of the Sea negotiations were economic, political-ideological, and military-strategic. In this section, each will be examined in some depth.

Overview

The first major policy instrument used during the course of the Law of the Sea negotiations was economic. Many of the various negotiating groups used economic arguments, rationales, and implicit economic coercion in attempting to influence outcomes. Some of the specific areas of economic discussion were deep seabed mining, fishing rights, taxation, and technology transfer. Economic threats were used implicitly by both the developed and developing countries. The second important instrument of policy in the Conference was political-ideological in

character. This included the use of ideological rhetoric, internal group pressure, geopolitics, the wielding of influence from other fora in the LOS talks, and the "one-nation, one-vote" parliamentary procedures of the Conference. While both the developed and developing countries used political instruments, the developing groups were more successful in using these sorts of instruments, mainly due to their more cohesive front in the G-77. The third major form of policy instrument at the conference was military-strategic. This was to be a two-edged sword since the major naval powers needed strategic passage and overflight for their fleets, something the developing countries were well aware of in their assessments. On the other hand the major naval powers tried to imply they would use military force if necessary in achieving policy ends if they were not appeased on transit issues and territorial waters claims. The threat of using military instruments was implicit in nature, and was of course limited to those states possessing fleets or other forms of military power. It was also largely unsuccessful or ignored, as one might predict it would be in a regime tending toward complex

interdependence, such as the deep seabed and ocean regime.

Economic Power

One of the most important economic aspects of the Law of the Sea talks was the potential deep seabed mining operations. The value of the polymetallic nodules and sulfides on the seabed was perceived to be an enormous factor throughout the negotiations. The Pacific floor alone, for example, has in excess of 1.5 trillion tons of manganese nodules.⁵⁶ While there is no current shortage of the four primary resource minerals found in the nodules (manganese, cobalt, copper and nickel), some experts believe that nickel and manganese, with major industrial uses, will be mined out from easily obtainable land sources by the turn of the century.⁵⁷ Trace amounts of chromium and bauxite are also found in the nodules, and it is interesting to glance at the import percentages of five of the minerals/metals in the Western industrial economies, comparing usage with COMECON:⁵⁸

⁵⁶ Ocean Minerals Company, Report on Manganese Nodules, internal document, 1982, p. 1.

⁵⁷ Conrad Welling, "The Ocean's Waiting Mineral Resources," Stockton's Port Soundings, August, 1980, p. 6.

⁵⁸ Conrad Welling, "The Future of U.S. Seabed Mining," Mining Congress Journal, November, 1982, p. 5.

	<u>Percent Imported</u>			
	<u>U.S.</u>	<u>EEC</u>	<u>Japan</u>	<u>COMECON</u>
Cobalt	98%	100%	99%	8%
Bauxite	91%	97%	100%	28%
Chromium	91%	100%	98%	2%
Nickel	70%	100%	100%	13%
Manganese	98%	100%	100%	3%

Clearly, the Western powers had a strong interest in seeing deep seabed mining occur, particularly if such mining would be undertaken by their national companies and would provide full time access to the minerals and metals.

There are several key factors involved in commercial production of the deep seabed minerals. The first is capital, which is required in the range of 1 to 1.5 billion 1983 dollars per station to build full scale mining stations. The second question is the most important in this study---technology. There are only two prototype systems available today, and all the major technology is proprietary and closely held by a few of the major mining

consortia. A third concern is the required return-on-investment (ROI) for such a project. Most analysts put the figure at roughly 25%⁵⁹ This figure is arrived at by a complicated model that takes into account return on similar raw material projects, market return on a selected "basket" of other investments, risk premiums, and so on. Naturally, another key factor in considering commercialization is the market price of the metals and minerals from the mines. This is difficult to predict with any accuracy. There has been great volatility in the price of cobalt, for example, which has ranged from \$1.50 per pound in 1964 up to \$25 per pound in 1978. The price is currently (early 1984) hovering at roughly \$13 per pound.⁶⁰ Finally, the supply of land-based metals and minerals will have a great effect on the possibility of profitable commercial deep seabed mining. As the easily exploitable sources of land-based ore are used up, the price should rise to the point that deep seabed mining is eventually economically feasible. Thus, the key questions facing potential investors include the following:

1. When will market conditions (both demand and

⁵⁹ Deep Seabed Mining Model, James Wilkerson, Chicago First National Bank, 1981.

⁶⁰ Commodity section of Financial Times.

supply) force the price to a commercially feasible level?

2. Will technology be available for conducting the mining?

3. Will there be a legally constituted regime of the oceans and deep seabed that will permit insurance, financing, and regulation of the young industry?

The most likely answers are 1) by the turn of the century; 2) yes; and 3) probably so, although its final form is difficult to predict, and the "regime" might well consist of several competing regimes with different sponsors.

The deep seabed mining question involved several groups and individual actors. Mineral consuming industrial countries, who consume the major portion of minerals and metals that would be used, are generally in favor of open mining operations. They would like to see the traditional "freedom of the high seas" extended to the deep seabed as well. As holders of the necessary technology, these industrial states are further in favor of an ocean regime that would allow them to begin mining as soon as it becomes economically feasible to do so. In economic terms, they

are seeking to capture the economic "rents" for themselves. The non-consuming countries (who are generally the LDCs) knew that it was important for the consumers to have a legally constituted regime to gain financing and insurance for the risky mining operations. The developing countries were thus able to force concessions based on their knowledge of the economic needs of the industrial economies for the minerals and thus for the regime. On the other hand, the industrial economies had a potential response--- they could begin mining without a regime. This would affect the developing countries in two ways, both negative: First, it would lower the price of the minerals and metals currently mined on land as new sources came on the market. This would hurt some of the developing countries in a critical way. Second, it would have effectively short-circuited the entire drive for acceptance of the "common heritage" principle, since it would have begun a cycle of "high seas" style exploitation of the deep seabed. This is precisely the course the U.S. is currently pursuing with the recent Reagan Proclamation, which states, "Deep seabed mining remains a lawful exercise of the freedom of the high

seas open to all nations."⁶¹ As a bargaining tool, the developed economies were able to use the threat of such application of classical "high seas" doctrine to move the Conference back toward a more moderate position. In effect, the developed countries said, "If you push us too far, we'll simply drop the whole idea of a global Treaty and mine under unilateral declarations."

Another aspect of the economic policy instrument in the treaty was in the area of technology transfer. As will be developed thoroughly throughout subsequent chapters of this dissertation, technology transfer gradually became an important issue in the Conference. Simply put, the developed countries had the technology and the developing countries wanted it (one exception here is India, a developing country with a fairly high level of marine technology at present). The developing countries recognized the importance of such advanced marine technologies as the deep seabed mining equipment, navigation instruments, advanced fishing techniques, ocean energy systems, and other items. These will be discussed in some depth in the following chapter. The industrial

⁶¹Ronald Reagan, Presidential Statement, 10 March 1983, p. 2.

countries were able to use the developing countries' desire for the technology to obtain concessions in other areas, such as transit and strategic straits passage. Ultimately, the technology transfer provisions in the deep seabed mining portions of the Treaty (Part XI) were a significant point of discord between the various negotiators during the Conference.

Another potent economic issue exploited by both sides was fishing. An increasing portion of the world's protein is taken from the sea in the form of living resources. The world harvest is currently estimated at 100 million tons of fish annually, and estimates of the total potential amount of food available range from a relatively conservative 200 million tons to over 7 billion tons, using advanced
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aquaculture and mariculture in the next century.

Economically, this was an issue that involved several groups. The U.S. and several other developed countries had little interest in distant fleet fishing, i.e. sending fishing fleets to ply the waters off distant coasts. Japan, the Soviet Union, the U.K., Poland, Norway, Denmark, and India, for example, all do have such interests, along

⁶²Elizabeth Mann Borgese, Aquaculture (Boston: Little, Brown, and Co., 1976).

with some of the Latin American countries. Many of the developing countries shared the concerns of the U.S. that such distant fleet fishing was lowering the off-coastal takes of the local fishermen. As a result of the crossing issue-lines on the question, the economic impact of the fishing issue was little used in the industrial/developing country negotiating stand-off over seabed mining. Fishing was used with particular effectiveness in issue linking, throughout the Conference, however, particularly by developing countries in dealing with the Soviet Union.

Exploitation of resources in the Exclusive Economic Zone was another concession-gaining instrument used by several groups. The major coastal states, such as the U.S., the U.S.S.R., India, Australia, Canada, Mexico, Chile, and many of the island states were all interested in gaining exclusive control over their off-shore natural resources out as far as possible. The concept of an EEZ met this requirement, but the non-coastal, land-locked and geographically disadvantaged states insisted upon various concessions in order to allow the EEZ concept to become part of the Convention. The trade-off was access and

transit rights to regional seas for the land-locked and geographically disadvantaged states, and overall high seas concessions (such as to the Authority and its organs) for other non-coastal, developing countries. The most important resource in the offshore areas, and the economic consideration "driving the problem" was the desire for offshore hydrocarbon exploitation. In the U.S. for example, over 60% of the known remaining oil and natural gas reserves are within the offshore regions.⁶³ Many experts believe that within the next 10-15 years, fully 50% of all the hydrocarbons produced in the world will come from offshore sources.

Another economic debate involved in the Law of the Sea talks was over the question of taxation. This was used as a policy instrument by several of the groups, notably by the industrial countries and the G-77. The industrial nations used both implicit and explicit threat of withholding revenues for the formation of the Authority and its organs when it became clear that the seabed regime was not going to be adequate to meet their needs. As a threat, this was quite plausible, if the Western countries had been

⁶³ Offshore Magazine, 20 June 1981, p. 4.

more cohesive in its application. Together, the U.S. and the leading European countries and Japan provide over 70% of the potential funding for the seabed regime. Because of their wide disparity over specific issues and degree of opposition to the regime, the industrial countries were unable to "hold the line" together on the threat to withhold funds. Today, only the U.S. is seriously considering withholding revenues from the seabed Preparatory Commission, and that amid general outcry and great controversy. The G-77, on the other hand, was able to use the threat of taxation very effectively in the negotiations. They proposed very high rates of taxation on offshore and "high seas-deep seabed" exploitation projects, with the proceeds to go to the developing countries and the Authority. In return for various concessions in other aspects of the regime (again, issue linkage), they scaled down the proposed rates of taxation to the present fairly modest level. The primary concessions won by G-77 were in the area of mandatory technology transfer powers and the parallel mining system, both crucial to the seabed regime.⁶⁴

⁶⁴It is, of course, difficult to say with total precision that "deep seabed mining technology transfer" was a direct, on-for-one trade-off with taxation; most observers in a position to know (Richardson, Beesley, Koh), do voice that opinion, however.

Overall, the economic issues and policy instruments in the Law of the Sea negotiations broke down to questions of property rights ("common heritage" versus "freedom of the seas"), taxation, and market control. The instruments of economic power available in the Law of the Sea dialogue seemed more or less evenly distributed between the developed and developing countries, but the LDCs were able to at least "hold their own" in matching economic instruments with the industrial countries as each side pursued its separate agendas. While much of the clamor and argument turned over economic issues, it seems that the political and ideological instruments were as effective in influencing the final outcomes, as will be discussed below. Naturally, it is difficult to say where the economic issues end and the political leverage begins, and the interplay of the economic debate produced much of the acidity in the discussion. Ultimately, the developing countries had more to gain in the economic issue areas (technology, a chance to exploit the seabed on equal terms with the West, protection from over-fishing, protection of land-based mineral producers) than the West had to lose. The

developing countries were able to exploit their economic instruments in connection with political advantages and strategic military concessions in order to obtain their desired agenda.

Political Instruments

The use of political instruments in the Law of the Sea negotiations was a triumph for the developing countries represented by the G-77. By using the "one-nation, one-vote" principle, they were ultimately able to direct the outcome of the Conference. The advanced industrial countries were unable to coalesce in the important issue-areas, and were equally unable or unwilling to use the formidable military and economic instruments at their disposal. The final voting results clearly demonstrated this, with the Western powers isolated in opposition to the Treaty, as discussed above. After the Treaty was opened for formal signature, virtually the entire G-77 signed as a block on the first day. All nine of the countries who have ratified to date are developing countries. Even if the

Convention is not fully accepted by the industrial countries, the Treaty stands as an example of the adroit use of political maneuver by the developing countries in the creation of new precedents in international organization and administration.

Beyond parliamentary political forces, the developing countries were also able to effectively use their ideology in undermining Western negotiating positions. The New International Economic Order and the UNCTAD Code of Conduct on Technology Transfer were both used to good effect in influencing the advanced industrial countries' bargaining positions. The Western sense of guilt, which even such observers as Henry Kissinger have acknowledged is operative at the governmental level, is a continuing source of influence on many influential Western diplomats and policy makers, particularly in European countries.

Additionally, the concept of the "common heritage of mankind" and a more equitable distribution of the world's resources are both difficult arguments to counter without appearing too burdened with naked self-interest, particularly in public debate. The developing countries

were able to use what James Malone called the "superficial attractiveness" of their arguments to great effect.

Naturally, superficiality is entirely in the eye of the beholder.⁶⁵ The developing countries were also able to exploit their larger collective geographic and population base to good effect. With the G-77 member states firmly astride the major shipping lanes and strategic straits of the world (see Annex), they were able to exert considerable political leverage over the industrial states through implicit threats. This geopolitical power was further enhanced by the commitments many of the industrial states had (and have) to developing countries as markets, clients, and sources of raw materials. Finally, in terms of population, the G-77 was able to point out continuously that they represented over 70% of the world's peoples, a difficult argument to counter on any level. Ultimately, the G-77 was able to bring to bear sheer weight of numbers and geographical position with a good deal of effectiveness as both a political and economic tool in the negotiations.

Overall, the key to the successful political maneuver of the G-77 was its cohesiveness throughout the Conference,

⁶⁵ Ambassador James Malone, Interview, Washington, D.C., June, 1982.

in marked contrast to the industrial powers. This is quite understandable, given the relative stakes of each side in the ocean regime, at least in the short term. While ocean policy is a small issue in most advanced industrial countries, it is a major question in many developing ones. The industrial countries also had a much wider range of interests in the oceans than the developing countries. The U.S. for example, was concerned about strategic questions, deep seabed mining issues, fishing rights, the EEZ, ideological questions, and so on. A developing country might well be interested only in ideological questions or simply in the mining procedures, for example. This allowed the G-77 to present a more continuously cohesive political front in the negotiations, while it conversely forced the developed countries into relatively splintered stances.

Military Instruments

One of Keohane and Nye's standards for judging when a regime is characterized by complex interdependence is the lack of military force as a primary tool.⁶⁶ Certainly, the

⁶⁶ Keohane and Nye, Power and Interdependence, Table 2.1.

formation of the ocean regime was an example of a complex global interaction where overt military force and even implicit threats were at a minimum. Indeed, it is possible to analyze events in a fashion that makes the military might of the industrial countries a liability in the negotiations. A glance at a map of the world (Annex) with the 200 mile zones clearly marked shows this clearly---a nation with global maritime interests and a Navy that needs strategic transit is at a major disadvantage without strong rights of passage under the new regime. There is an old saying, "One who can destroy a thing controls it." So it is with the many straits and canals in the world. Nasser in Egypt, Franco in Spain, Truillijo in Panama, and many others have shown this form of power over the years. The developing countries can relatively cheaply and easily block many of the canals and straits that are vital to Western commerce and naval movement. As a current example, Iran has been threatening to close the Gulf of Hormuz in connection with the Iran-Iraq war, an action that would be a major problem for the Western democracies.

One of the prime considerations of the U.S. and other

major maritime powers (U.S.S.R., U.K., France, Australia, Italy, etc.) during the LOS Conference was to ensure a regime that allowed freedom of transit and overflight for military and commercial carriers. The developing countries were fully aware of this geopolitical need of the advanced countries, and they utilized strategic and straits passage as a major bargaining chip in forcing the Western powers to accept the deep seabed regime and the "common heritage" principle. In effect the Western maritime powers were forced to bargain away the deep seabed to retain a small portion of the former "freedom of the seas" regime that had categorized the classical ocean regime. Indeed, in the U.S. today, one of the most persistent criticisms of the Treaty is that the U.S. "gave up" the seabed in order to hold on to what it already had---freedom of the seas.⁶⁷ In essence, the story of the negotiations (up to the Reagan administration) was that overall bargain: seabed for straits, "common heritage" for a portion of "freedom of the seas." The Carter Administration (and the Nixon-Ford Administrations as well) were prepared to sign the Treaty as it stood in order to obtain the strategic passage

⁶⁷ See, for example, William Safire in the New York Times, who has often commented on the LOS Treaty.

sections and the overall benefits of a global, legal regime. The Department of Defense in the U.S. argued forcefully up to and including the cabinet level in the Reagan Administration ⁶⁸ in favor of the Treaty. Overall, then, the military powers found themselves in the interesting and unattractive position of being in effect penalized for their possession of raw naval power. The fact that a country had a major Navy generated a requirement to obtain strategic passage for it. This penalty for possession of military power was an unusual position for countries used to controlling the ocean regime by the implicit threat (or the explicit use) of naval power, to say the least.

On the other hand, the developing countries knew that if pushed too much on the issue of straits passage, the major naval powers might simply use force to open straits and protect vital canals and other assets. The threshold for such action was fairly high, and remains so today. The only recent instance of a major naval power using military-naval power in forcing the high seas principles was the Gulf of Sidra incident in July, 1980, where two U.S. Navy

⁶⁸ The source requested confidentiality.

F-14s shot down two MIGs operating out of Libya. The very presence of the Nimitz in the Gulf of Sidra was to force the high seas principle on the Libyans. The example and the actions of the Libyan leader, Khaddafi, were beyond the threshold discussed above, and it showed the rest of the developing countries that there was both an ultimate limit as well as significant room for maneuver before actual⁶⁹ military force would be used.

Additionally, the major naval powers were not the same group as the industrial powers, as had once been the case historically. West Germany, Japan, and most of the European powers are no longer major naval powers, and they were much less concerned in the Conference with issues of strategic transit and overflight. The major naval powers were the U.S., U.S.S.R., the U.K., and France. As a result of the small number of major naval powers, there was a general tendency to turn aside such issues in favor of more universally controversial problems, or simply to use the need for strategic transit as a lever via issue linkage. There was very little tendency to deal with the issue head on. The Western powers without significant military naval

⁶⁹It is, of course, difficult to "draw the line" with any precision. At this writing (Fall, 1983), the example of the Iranian threat to close the Straits of Hormuz is germane.

power were less interested in the issue, and exercised a restraining influence on the other major naval powers.

In the final analysis, the only two powers who could have combined to force a favorable ocean regime for their navies were the U.S. and the U.S.S.R. To do so, however, would have required a rare level of cooperation between the superpowers (from their standpoints) and most probably a threat to use force against recalcitrant developing countries. Ironically, much of the impetus for the Conference had come from the U.S. and the U.S.S.R. in order to shape a new regime, as described in the opening chapter. Once the Conference began, however, the dynamics of the discussion soon took the agenda well beyond the simple transit regime the two superpowers had envisioned. The U.S. and U.S.S.R. were also divided by their ideological differences, particularly after the Reagan Administration took office. The two superpowers were mutually restrained from using even the most implicit sort of naval coercion. By the end of the Conference, the age of gunboat diplomacy, at least in the formation of ocean regimes, seemed quite dead.

E. Agenda Formation and Linkage Strategies

Overview

An agenda is defined in the dictionary as merely a⁷⁰ "list or program of things to be done." Within the context of regime formation, agenda setting has been called "how issues come to receive sustained attention by high⁷¹ officials." In the Law of the Sea negotiations, much of the political maneuvering within the Conference turned on various state and internal negotiating groups (ING) actors attempting to manipulate the agenda for their benefit. The ability to control the agenda was a powerful instrument in determining final outcomes. A second instrument used during the Conference to influence outcomes was linkage strategy. "Linkage" has been defined, in a political sense, as a "global negotiating strategy holding that progress on one front is connected to progress on other⁷² fronts." In the Law of the Sea negotiations, where the applicability of military force by major powers was

⁷⁰ American Heritage Dictionary, "Agenda," p. 13.

⁷¹ Keohane and Nye, Power and Interdependence, p. 32.

⁷² William Safire, Safire's Political Dictionary (New York: Random House, 1978), p. 379.

extremely limited, linkage became an "instrument used by poor, weak states" in "extracting concessions or side payments from rich and powerful states."⁷³ This is classic linkage strategy.

Agenda Formation

The politics of agenda formation have been described as "subtle and differentiated," particularly as a negotiating system moves closer to complex interdependence,⁷⁴ as the ocean regime clearly illustrates. The leading or operative question becomes: What issues will become politicized, i.e. become the subject of intense interest and controversy and thus rise to the top of the negotiating heap? Within the ocean regime negotiations, there were two aspects to the question. The first part of the question was concerned with defining the initial agenda that the Conference would follow, including the formation of committees that would direct the negotiating process, draft initial versions of the Treaty, define the issues, and process comment and discussion. The second part of the

⁷³ Keohane and Nye, Power and Interdependence, p. 31.

⁷⁴ Ibid., p. 32.

overall question of agenda formation was in terms of the on-going portion of the negotiations. How were issues politicized during the course of the negotiation, once the initial overall agenda had been agreed upon and accepted?

The first aspect to be considered in defining the initial agenda for the Conference was the reason it was called. One observer said, "The most important reasons why states are pressing forward with the Conference is widespread dissatisfaction with the existing legal regime⁷⁵ or lack of it in the oceans." During the late 1960s, the regime of the oceans was breaking down as states pressed forward huge claims of 200 mile territorial seas and made preparations for highly exploitative uses of the oceans. There was a broad coalition of states, actors, and organizations that wanted to re-define the ocean regime. Some of the actors included major industrial and maritime powers, the fishing states, the developing world, and even the land-locked and geographically disadvantaged states. Their motives were legion, but their overall objective was compatible---to develop a solid, respected, observed ocean regime for the universal regulation of the world's oceans.

⁷⁵J. Stevenson and B. Oxman, "Preparations for the LOS Conference," American Journal of International Law, Vol. 68, 1974, p. 2.

The specific role of both the U.S./U.S.S.R. discussions and the dramatic Pardo speech have already been discussed.

Over a period of years (1968-1973) the U.N. convened a number of standing committees which developed proposals both for the Conference structure and the opening agenda. When the Law of the Sea Conference officially opened for business in 1973, both the structure and the agenda were accepted from the early committees. The three major subcommittees were established as full committees of the Conference with the following responsibilities:
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Committee I: Establishment of an international organization (i.e. the actual machinery of control) for the seabed under the high seas and the oceans in general.

Committee II: Traditional sea usage issues, including the territorial sea, straits, the high seas, fisheries, and the continental shelf.

Committee III: Pollution, scientific research, and technology transfer.

Two points are important to make here. First, the most significant early decision of the committees and the Conference was to negotiate a comprehensive Sea Law Treaty.

⁷⁶Ibid., pp. 3-4.

There was virtually universal agreement on this point. This can be ascribed to the need most states felt for a general ocean regime and to the belief (which was to be battered over the next ten years, and badly) that it would be possible to negotiate the issues together. There was a sense of belief in the U.N. system, in the shared vision of the general principles of the new regime, and in the specific norm of the "common heritage." As the Conference continued it became clear that there was not such a shared commonality of approach to many of the major issues, from the fundamental one of "common heritage" versus "freedom of the seas" on down to the most minute details about the structure of the various organs of the Authority. The splits among and between the various negotiating groups widened during the ten years of the Conference, rather than gradually closing together. Some of the reasons for the continued distance between the negotiators included the increasing politicization of the U.N., a growing sense of disillusionment with the entire machinery of international organizations, increased bitterness on the part of the developing countries at the inequity of their position in

the world economy, irritation on the part of the industrial world at the growing stridency of developing country rhetoric, and the continuing economic, political, and military conflicts and crises that consumed the world during the turbulent decade of the 1970s. Little of this could have been foreseen at the start of the decade when there was still a lingering faith in the machinery of international organizations and a belief that things were going to get better for the developing countries as the world economy would continue to expand.

Additionally, each of the major parties in the Conference believed in the reason and logic of their respective positions and that they would ultimately prevail in a global forum. This is important to bear in mind in any negotiating situation, particularly when the issues are emotionally important to the players. To the major maritime powers, it appeared evident and just that they should be allowed straits passage, while to the developing countries of the G-77, it only seemed right that the rich should share the bounty of the deep seabed. Each side thought their positions were not only just but mutually

compatible as well. Unfortunately, as the decade progressed, this came less and less to be so.

Delegates to each of the Committees were elected from the floor of the Conference at large. Since these Committees were responsible for drafting the agenda, setting the outline of the discussion, and directing the drafting of initial versions of the Treaty, placement of delegates on the various Committees was a critical part of the agenda formation strategy. The initial debate on the Committees was described as "moderate and serious."⁷⁷

Almost immediately it became apparent that the traditional alignment of political actors was going to be shifted and changed during the Conference due to the variety of issues under discussion. The major Committee assignments and the Presidency of the Conference are outlined below:⁷⁸

President: Ambassador Hamilton Shirley Amersinghe of Sri Lanka, former chairman of the Seabed Committee. A moderate, essentially non-aligned leader, but a passionate advocate of the "common heritage" principle. He was later replaced (after his untimely death in 1980) by Tommy T.B. Koh of Singapore, another moderate.

⁷⁷J. Stevenson and B. Oxman, "The Third UNCLOS: 1974 Session," American Journal of International Law, Volume 69, 1975, p. 2.

⁷⁸Ibid., pp. 3-5.

Committee I: Chairman Paul Bamela Engo of Cameroon, a G-77 leader and advocate of the NIEO and the "common heritage", who later was also very influential in the Preparatory Commission, which is today charged with setting up the new International Seabed Authority. The negotiating group within the committee was chaired by Christopher Pinto of Sri Lanka, also associated with the "common heritage" principle and the G-77. This Committee was involved with the international machinery of the Seabed Authority and its organs.

Committee II: Chairman: Ambassador Andres Aguillar of Venezuela, a leading advocate of territorial rights in the continental shelf, and a proponent of the "common heritage" principle. He was also a leader in the Latin American Group. The Committee dealt with the issues of the Territorial Sea, straits passage, regime of the islands, high seas, and the EEZ.

Ambassador Aguillar also served as head negotiator of the Committee.

Committee III: Chairman: Ambassador A. Yankov of Bulgaria with Jose Vallarta of Mexico serving as chief

negotiator. The Committee was concerned with scientific research and technology transfer.

The "one-nation, one-vote" principle was used in electing delegates and chairmen to each of the Committees, and this is reflected in the leadership of the Conference, which did not include a single individual from a major maritime or industrial country, at least as the initial agenda was produced.

The initial agenda was established by a process of allowing any country to submit proposed texts and drafts of the various portions of the Treaty. These were sent to the appropriate committee depending on content. Each committee was then tasked with producing several versions of the Treaty, conforming to the major trends of the submissions. This was an obviously subjective judgement based on the membership of the individual Committees as well as on the material submitted. The discussion within the Committees varied in content and subject. According to one observer, the First Committee, which was charged with designing the machinery of the new regime, produced the most political discussions, with colonialism, economic ideology, and

political issues more often than not the topics of discussion. The agenda in the First Committee seemed, at least at the outset, to be directed at "scoring ideological
 79 points."

The Second Committee was rather more successful in clearly approaching its agenda in an issue-oriented rather than an ideological manner. In a significant document submitted at the end of the first session, the Second Committee summarized its first round, which set the initial agenda for its many technical issues, dealing with territorial seas, the continental shelf, EEZ, high seas,
 80 fisheries, oil exploitation and several other questions:

"... the idea of a territorial sea of 12 miles and an exclusive economic zone (EEZ) ... to a total maximum distance of 200 miles is ... the keystone of the compromise solution"

Also:

"Acceptance of this idea is ... dependent on the satisfactory solution of other issues, especially the issue

⁷⁹ Professor Bernard Oxman, University of Miami, Interview, Kingston, RI, June, 1983.

⁸⁰ U.N. Document, A/CONF.62/L.86, 28 August, 1974.

of passage through straits used for international navigation, the limit of the continental shelf, and the aspirations of the land-locked countries."

Other issues remaining for discussion, but also firmly on the agenda, included the concept of a new regime of islands, giving island-states significant internal control over coastal waters, degrees of economic exploitation in the EEZ, and control over living (fishing) resources depending on species characteristics and migratory patterns.

The agenda of the Third Committee was the least controversial of the three groups. Concerned with marine pollution and technology transfer, the group discussed issues about which there was relatively little disagreement---clean oceans and the need to undertake principles of development. It is important to distinguish here between the mandatory (and very controversial) technology transfer under the seabed regime (Committee I) and the non-mandatory, broad principles of technology transfer discussed by Committee III. Committee III was merely charged with writing a section of the Treaty that

would encourage, not mandate technology transfer to the developing countries. This was a critical difference between the work of the two Committees.

In terms of the agenda, the relatively easy issues which enjoyed wide support were settled within the first several sessions, although some remained open for "linkage" throughout the discussions. The major remaining issues were termed the "hard core" or simply "hard" issues. Some⁸¹ of the more difficult included:

1. Full acceptance of the "common heritage" principle as the central norm of the ocean regime. Despite the fact that several U.S. Presidents had endorsed the idea (Johnson and Nixon in particular), the U.S. and most of the industrial countries were not enthusiastic about the central position the "common heritage" principle would occupy in the regime. The real supporters were the G-77, the U.S.S.R. and the Eastern European Block (for political reasons), some of the liberal or politically-motivated Western countries (France, Japan, Australia, New Zealand, Canada, Scandinavia).

2. Establishment of a powerful international

⁸¹Verbage, prioritization, and agenda preparation are the author's opinions, although background came from a wide variety of interviews with delegates.

organization to run the deep seabed. Primarily a child of the G-77, the concept of a strong central Authority with broad powers of regulation, mining, and mandatory technology transfer was also supported by land-based mineral producers and land-locked - geographically disadvantaged states as well.

3. Rights of passage and overflight through and above international straits. This agenda item had been the genesis of the entire conference insofar as the U.S. and U.S.S.R. were concerned in the late 1960s. They continued to support it as did the U.K., France, and other maritime-oriented states. Observers have commented that one of the amusing pairings at the Law of the Sea Talks was the tendency for the Admirals and other naval officers from the U.S. and U.S.S.R. to spend a great deal of time closeted together plotting their strategy for ensuring the navigational rights agenda would be fulfilled.

4. Exploitation of Living Resources: Particularly the right to operate distant fishing fleets in traditional fishing grounds, even within the EEZs of other countries. Japan, the U.S.S.R., Poland, Denmark, Norway, Iceland, the

U.K. were all involved in this controversy---an issue with strange bedfellows indeed.

5. Regime of the Islands: The Philippines, Malaysia, Indonesia, Fiji, Pacific Micronesia, and a few other archipelagic states worked very hard together to ensure that island-countries would have absolute territorial control over their "internal waters" (i.e. the waters between their island constituents) even if such waters were well beyond the 12 mile territorial sea. The principle argument was that they needed such concession in order to maintain sovereign control over their widely-separated territories. They were willing, for the most part, to grant concessions on almost any issue in order to ensure such control.

6. Rights of Land-Locked and Geographically Disadvantaged States. (LLGDS) While most of the LLGDS countries were developing nations, they were joined by such Western powers as Switzerland, West Germany, Austria, and others. Their desires included absolute right of access and transit to the sea, the right of port usage, and the right to share in the exploitation of the immediate

offshore areas and the deep ocean. They identified themselves as the Group of 21 (G-21), corresponding to the number of states involved. They received strong support on their demands from the G-77 as well.

7. Establishment of a mechanism for binding dispute settlement. These provisions, in many ways the most advanced agenda items in terms of impact on international law, received support from a mixed coalition of powers.

Most of the maneuvering over agenda formation turned on the seven issues noted above, and most were subject to "issue linkage" throughout the negotiations, as will be discussed below.

Issue Linkage

Almost throughout the Conference, agenda formation was inextricably linked with the strategy of issue linkage. The Conference quickly evolved into a long series of compromises, bargains, offers and counter-offers fashioned by the various negotiating groups, state-actors, Committees, ad hoc gatherings, outside writers and

scholars, and anyone else with the slightest semblance of a platform or interest. Through the ten sessions between 1973 and 1982, the driving force of the Conference was the ability of the various actors to establish and maintain their negotiating groups and make strategic linkages on the issues that would most benefit them. Military force, as mentioned above, was not a factor in the complex ballet, which was orchestrated almost totally by political and economic factors. The Conference came very close to embodying a pure form of "complex interdependence" as outlined by Keohane and Nye.⁸² Within the linkage strategy, the major powers were further constrained by their complex domestic situation from a free range of motion. LDCs generally had a smaller number of important issues to juggle and were thus less constrained by domestic pressure groups. The developing countries, on the other hand, were occasionally constrained by the overriding importance of a single issue, such as the island countries. How, for example, could the Philippines ever compromise on the island regime it needed to control its "internal waters?"

The industrial countries, overall, had the least

⁸²Keohane and Nye, Power and Interdependence, p. 37.

freedom of movement, however. Within the U.S., for example, there were strong domestic forces that operated (frequently on cross purposes) on all seven of the major issue areas:

Common Heritage Principle - Many influential journalists and academics were in favor; some were opposed. Politicians were wary of appearing to "give away" the deep seabed to the developing world, although some were idealistically attracted by the idea.

Deep Seabed Mining - Industrial concerns involved in the mining sought a simple "frontier office" where they could stake their claims, and bitterly opposed the technology transfer and sweeping mandate given the Authority. On the other hand, many academics, internationalists, and international lawyers were strongly in favor of this "new concept" in international organizations and law.

Rights of Navigational Passage - The Department of Defense and the Navy in particular were strongly in favor of the Treaty for the Navigational aspects of the accord. Most shipping companies and major oil firms were likewise

attracted to the Treaty, although most of them eventually opposed the Treaty due to the technology transfer provisions.

Fishing Rights - U.S. fishermen wanted limits on distant fleet fishing in U.S. coastal waters. Environmentalists were generally in favor of the ecologically oriented provisions on fishing. Most in the U.S. delegation saw the fishing sections as an area the U.S. could compromise (via linkage strategy) to gain leverage elsewhere.

Regime of the Islands - The U.S. had interests in this due to its archipelagic territories in the Pacific (Micronesia, Guam, Hawaiian Islands), its offshore islands, and its Caribbean interests.

Land-Locked and Geographically Disadvantaged States - Some academic interest in this from an idealistic standpoint was generated in the U.S.

Binding Dispute Resolution - Very strong academic and legal interest in this issue was present in the U.S.

Each of the major Western powers faced a similarly

complex mix of forces and desires from the domestic side, although this was mitigated to a degree since the Law of the Sea Treaty is hardly a burning issue in most major countries. This downplayed the role of public opinion (which remains almost non-existent today), but enhanced the influence of small lobbying groups that found it easy to line up government support for their (the lobbyists') respective positions. The dearth of public opinion gave legislators little incentive to become informed on the issue in major Western countries, and allowed a further enhancement of manufactured opinion. Some of the principal lobbying groups were working in favor of major mining and industrial consortia. In the final analysis the enhanced influence of the lobbyists on the issue areas made for a complicated back-and-forth struggle for the major powers during the negotiations. The major powers (at least the major Western powers) also underwent changes of government during the long period of the negotiations. This had the effect of further opening the door to inconsistent special interest group considerations. Within the U.S., for example, the shift from the Nixon/Ford administration (in

favor of the Treaty) to Carter (strongly in favor of the Treaty and the developing country principles) to the Reagan Administration (strongly opposed to the Treaty and totally in favor of the freedom of the high seas) made for a weak overall negotiating position for the advanced countries.

Within the developing countries, these factors were essentially reversed, with favorable effects. Most of the developing countries had what might be termed a "one-two" priority mix. Many were deeply committed to only one of the major issue areas---the Philippines, for example, was passionately committed to the regime of the islands, for the reasons discussed above. That was the "one" commitment. The "two" commitment was to the overall developing country ideological desire for the common heritage principle. This "two" commitment was very strong in the developing countries as a whole. Changes in government and internal influence had little effect on either commitment. The "two" commitment, after all, was at the very root of the developing countries' worldview, entailing as it did the concept of redistribution of wealth, anti-exploitation, and collectivization in a

balanced world fashion. This "one-two" priority mix was effective because it was so simple. It generally allowed room for maneuver, flexibility in agenda formation, and linkage of unrelated issues to maintain the central coalitions. There were occasional problems when one actor's main issue was absolutely critical to that actor's national interest, such as the Philippine case. As a general rule, however, there were so many other issues the Philippines could compromise on, however, that maneuver was eminently possible. Overall, the "one-two" mix worked superbly for the developing countries. As many observers have commented, the ability to connect unrelated issues is an excellent way of forcing concessions from more powerful countries.⁸³ By linking issues that were essentially unrelated, such as land-locked states rights, regime of the islands, mandatory technology transfer, deep seabed Authority, and so on, the developing states were able to maintain their overall control of the Conference. On the other hand, the major powers, unable to use their military instruments and incapable of maintaining a solid front on the issues within their own delegations, were

⁸³Professor Jon Jacobson, University of Oregon, Interview, Kingston, RI, June, 1983.

utterly incapable of maintaining the connected industrial country policy that would have moved the Conference more in their direction. The net result was a Treaty that is fundamentally more favorable to developing country interests.

An additional aspect to the concept of strategic issue-linkage remains. Having formed a relatively solid wedge under the aegis of the G-77 banner and the "common heritage" principle, the developing countries were left with the problem of how to obtain the support of the developed countries for what was, in effect, primarily the developing world's agenda and Treaty. This was also accomplished via a larger linkage strategy, as indicated above. The fundamental trade-off was made between strategic navigational rights and passage (a key geopolitical and military-strategic concern of the major powers) and the economic system of the deep seabed. As mentioned earlier, this compromise is what some observers⁸⁴ have called "the great bargain" of the Conference.

Knowing that there were major groups in the advanced countries who would strongly support a Treaty with liberal

⁸⁴ Ambassador Tommy T.B. Koh, President of the Conference, Interview, Medford, MA, March, 1984.

straits passage and strategic transit, the developing countries linked the transit sub-regime to the deep seabed sub-regime. This, the developing countries thought, would be a sufficient quid pro quo to obtain developed support for the overall Treaty.

A second major linkage strategy that was part of the Conference might be described as the "overall link." This reflects the opinion of many observers in the industrial world that one goal of the Conference was simply to have an ocean regime. This was necessary for developed-industrial country interests in global harmony, trade, economic expansion, access to markets, and so on. The developing countries also wanted an ocean regime, but more for ideological than economic reasons. The industrial countries were offered, in essence, an overall link---give the developing countries the ideological regime they want and the industrial countries would in return receive the economic benefits of having an overall ocean regime. In other words, the developing countries utilized their political power (to vote in a regime) in return for economic concessions.

Overall, the developing countries very effectively used agenda formation and strategic linkage of issues to move the Conference in the direction they desired. The ideologically based Treaty/regime is the result. The "common heritage" is firmly enthroned as the centerpiece of the Convention, the deep seabed Authority has mandatory technology transfer and full control over the seabed resources, and the various concerns of the developing countries have generally been addressed. The advanced industrial countries are left with straits passage, freedom of the High Seas, and the simple fact of the regime in return. While the final outcome of the Treaty is in doubt, and will be until it receives the support of more of the major powers, there can be little doubt that the developing countries intelligently utilized the policy instruments at their disposal, manipulated the agenda in innovative ways, and technically managed the strategic issue linkages both within their own groups and in the larger arena of the Treaty negotiation in masterful ways. The result is an ocean regime that is favorable to developing world interests in most areas.

The question, however, becomes one of strategy and tactics. The developing countries managed the tactical development of the new regime effectively---perhaps too well. Indeed, if the major industrial powers continue to reject the Treaty and work unilaterally or via mini-Treaties (as the Reagan Administration has done already, both with the Reagan Proclamation and in negotiation with allies on a small mining Treaty), the Treaty may never have the influence and impact it deserves.

F. Conclusions

In this section of the dissertation, the focus has been on the political and economic forces that helped shape the overall emerging regime of the oceans. It has covered the ten years of negotiations at the Third United Nations Conference on the Law of the Sea. The variety of variables examined in studying the overall dynamics of the Conference have included goals of actors, policy instruments, agenda formation, and issue linkage. The overall conclusion that one draws from such an analysis is that the Treaty represents a move from a chaotic situation to a more orderly one. In general, of course, a shift from chaos to order is not always an absolute good. Order is not the only value to be considered, and history is replete with examples of regimes that were quite orderly yet repressive and totalitarian. Yet the emerging ocean regime seems to bring additional values with it, including a striving for equity, consistency, and practicality. The Treaty is the result of a long process of negotiation, and is full of

compromise. It is, however, a major step in the right direction. Its chief value lies in its contribution to the progress toward a more orderly and equitable world system. For these reasons, the concept of an orderly Treaty along the lines of the current Convention must be considered a positive step.

At the same time, the Treaty as written can clearly be viewed as a well executed tactical success for the developing world, although it also offers some benefits to the industrial countries as well. The ability of the LDCs to maneuver in the "complex interdependent" world of the oceans was noteworthy, and it led to a document that provides a forum and some substance to long-cherished principles espoused by the Third World (such as the "common heritage," some NIEO oriented passages, mandatory technology transfer and so on). The larger question surrounding the Treaty is one of universal acceptance. Some industrial countries (notably the U.S., U.K., West Germany, Italy, Belgium, and the Netherlands) have voiced serious doubts about the Treaty.

In the remainder of this study, one particular issue,

that of marine technology transfer, will be central. Having accepted the premise that the Treaty is a positive good, it seems obvious that efforts must be undertaken to make it universally acceptable. One of the often mentioned objections of the Western "hold-outs" is the technology transfer section of the Treaty. By examining technology transfer in the Law of the Sea context, it is hoped that positive recommendations and conclusions can be drawn that might help end the current stalemate over the Treaty. As this study moves toward a comprehensive examination of the technology transfer provisions of the Treaty, the material in these early sections will be critical to a full understanding of the issue.

IV. SURVEY OF MARINE TECHNOLOGY

A. Introduction

One of the most important, though often overlooked, aspects of the marine technology transfer issue in the Law of the Sea context is simply the nature of the technology itself. Beyond the inflamed rhetoric, the political and economic idealism, and the cries for capitalism and free markets, there remains the basic fact of the technology that sits at the center of the dispute. Too often, marine technology is debated as an academic exercise without considering the actual use and value of the capital and knowledge involved.

In this section, an overview of the technologies at the center of the debate will be offered. The chapter is organized functionally around the uses of the technologies, and the material has been gathered from a wide variety of sources. While it is nearly impossible to present a comprehensive portrait of the varied and complex field of marine technology, the material in this chapter should be

regarded as a snapshot taken at a given moment. The probable trends and pattern of further discovery and development are indicated where possible, but it should be realized that this material represents the tip of a huge iceberg, not a complete survey. Its value lies in giving the reader a sense of the immense value, complexity, and scope of the marine technologies at stake in the Treaty.

B. Deep Seabed Mining

Of all the technologies that involve marine exploitation, the most controversial is that of deep seabed mining. The potential significance of the ability to exploit the mineral riches of the deep seabed is considered by many experts to be critical for the further industrial expansion of the world's economy. Certainly the most controversial section of the LOS Treaty is the portion of the Convention dealing with deep seabed mining, where a global "Authority" has been granted the power to fully regulate the staking of claims, the operations and processing of the mining, and to mandate technology transfer. The underlying rationale, of course, is that the deep seabed represents the "common heritage of mankind." The technology involved in the recovery of minerals from the sea is complex, expensive, and relatively recent. The industrial countries and corporations that hold the technology consider it proprietary and object to the

mandatory transfer to the Authority under the terms of the convention. The developing countries believe that since the technology is the key to exploiting the "common heritage of mankind," it becomes part of the heritage itself, and is thus liable for transfer to the Authority and thence to the developing countries interested in deep seabed mining as a source of income or minerals.

In this section of the chapter, the focus will be on the background and specific technology required to undertake deep seabed mining operations.

Ocean Minerals

Most of the minerals in the world's oceans are naturally occurring deposits that are either found in seawater or have been carried down to the oceans via freshwater run-off from the lands. Only three pure elements (magnesium, bromine, and tin) and one compound (salt) are currently economically feasible for ¹ electrochemical extraction directly from seawater. Four

¹ Ocean Mineral Company, "What are Manganese Nodules?", internal document, 1982, p. 1.

other elements, however, have naturally precipitated out of seawater and formed nodules which cover much of the floors of the world's oceans---manganese, copper, nickel, and

²
cobalt. The first of these "manganese nodules" was discovered by a British oceanographic vessel, H.M.S. Challenger,³ during an expedition in 1873-1876. The lack

of technology precluded mining the nodules, although the economic value of the deposits was immediately apparent. The nodules, which range in size from 1,000 pound boulders to walnut-like stones, have as components the four elements mentioned above, generally in the concentrations shown

⁴
below:

Manganese	25.0%
Nickel	1.5%
Copper	1.2%
Cobalt2%

(The remainder is composed of Silicon and Iron, with traces of other minerals and metals)

The nodules occur throughout the floors of the world's oceans and seas. The richest and most concentrated fields of the nodules are located southeast of Hawaii and just north of the equator in the Pacific Ocean. There is no

²G. Ross Heath, "Manganese Nodules: Unanswered Questions," Oceanus, Fall, 1982, pp. 37-38.

³Robert Knecht, Senior Scientist, Woods Hole, Interview, Woods Hole, MA, June, 1983.

⁴Percentages vary. Remainder of nodules is Silicon and Iron.

explanation for the concentration of the nodules in this particular area. The fields are in water depths of 14,000-18,000 feet. These nodules average about two inches in diameter, and are of an irregular shape, resembling a medium sized potato. Most estimates place the quantity of nodules in the Pacific Ocean alone at 1.5 trillion tons, which would easily supply the world's industrial needs⁵ (considering reasonable expansion) for hundreds of years. The maps in the annexes give some idea of the distribution of the nodules over the ocean floors.

Other than the bare geological facts, very little is known about the formation process of the nodules or their rate of occurrence. Specimens show that the minerals form around some object---bone fragments, shark's teeth, coral, clay, metal chips, or basalt rock---and gradually increase in size. The rate of growth varies from specimen to specimen, with some dated via radioactive techniques to 1,000,000 years old and others formed around modern objects⁶ such as discarded spark plugs or artillery shell casings. There are several theories which describe biological or geological explanations for the formation and location of

⁵ Estimates of formation time vary with the speaker, but the range seems to be from 300 years to essentially indefinite.

⁶ Dr. David Ross, Senior Scientist, Woods Hole, Interview, Woods Hole, MA, June, 1983.

the nodules, but all are based more on conjecture than⁷ scientific research. Some observers are conducting experiments to attempt to "grow" the nodules in artificial seawater zones, but the difficulty of duplicating the terrific pressures of the deep seabed have defeated such⁸ attempts thus far.

Strategic Minerals

Of the four minerals produced from deep seabed nodules, two, cobalt and manganese, can be classified as true strategic minerals. This means that they are necessary in completing various industrial processes of national importance and have limited substitutes. The other two minerals, copper and nickel, are also important in a wide variety of industrial and fiduciary uses, but several possible substitutes are available.

⁷Ibid.

⁸Dr. Kurt Shusterich, Interview, Woods Hole, MA, April, 1983.

Cobalt: A white metal valued for its hardening characteristics, cobalt has a bluish cast in its pure form and a melting point in excess of 1400 degrees F. The largest single use of cobalt is in the production of alloys containing over 60% cobalt which are used in jet aircraft engines, as drill bits for advanced mining rigs, and in cutting tools. The metal also has uses in magnet production for high technology uses and a variety of other medical and industrial functions. The leading land⁹ producers of cobalt include:

Zaire:	14,500 Tons Annually
New Caledonia:	4,600 Tons Annually
Australia:	3,800 Tons Annually
USSR:	2,200 Tons Annually
Other:	9,700 Tons Annually

Manganese: The principle use of this mineral is in the production of high quality steel. As the Charles River Associates, a Boston consulting group, have commented, "Manganese is a cause for some concern because the

⁹"Strategic Metals, Critical Choices," Time, January 21, 1980, p. 42. Also the Bureau of Mines, U.S. Government.

possibility of finding substitutes is extremely limited."¹⁰

Manganese is a gray, hard, brittle, lustrous metal, capable of taking a high polish, and resembling iron in most physical respects. The presence of manganese in steel in small amounts increases the hardness, tenacity, and elasticity of the final product. More than 60% of the world's supply is currently mined by the Soviet Union and South Africa:¹¹

USSR:	9,480,000	Tons Annually
South Africa:	4,759,000	Tons Annually
Gabon:	1,885,000	Tons Annually
Others:	7,115,000	Tons Annually

The industrial countries are particularly dependent on continuing supplies of manganese due to its critical importance in steel production and the total lack of substitutes.

¹⁰Ibid.

¹¹Ibid.

Nickel: A soft, ductile, easily polished, non-corrosive element, nickel has a wide variety of industrial uses. It is alloyed into steel to improve the ability of the finished steel to survive in high temperature environments. Nickel is also used in nuclear power and desalination plants, minted in coinage, and applied to batteries and other electrical products due to its excellent conductivity. Most observers believe that the production of nickel will make the deep seabed mining projects economically feasible, at least for the first few decades. As Conrad Welling, Vice President of Ocean Minerals Company, commented in the American Mining Congress Journal, "the mining of manganese nodules is basically a nickel business today . . . " ¹² Most observers believe that the economic value of the nodules will flow first from the nickel, then copper, with cobalt and manganese produced at first as important by-products. Major producers of ¹³ nickel today include:

¹²Conrad Welling, "Ocean Mining Systems," Mining Congress Journal, September, 1976, p. 3.

¹³Constance E. Rea, "U.S. Security and the N.I.E.O.," University of Pittsburgh CACISS Paper, October, 1977, p. 16.

Canada:	408,000	Tons Annually
Norway:	48,000	Tons Annually
New Caledonia:	36,000	Tons Annually
Dominican Republic:	30,000	Tons Annually
Others:	78,000	Tons Annually

Copper: One of the most ancient of all "domesticated metals," copper is used today primarily for its electrical conductivity and ductility. It is capable of being worked into a wide variety of shapes and forms, and is an excellent conductor both of electricity and heat. It can be alloyed to form brass, bronze, and other metals. Copper is used in many chemical and medical applications as well. While substitutes are available for many of copper's functions, it is still a valuable and important industrial metal. The major producers include:

¹⁴Ibid.

U.S.:	1.2 Million Tons Annually
U.S.S.R.:	1.1 Million Tons Annually
Chile:	.8 Million Tons Annually
Canada:	.7 Million Tons Annually
Zambia:	.7 Million Tons Annually
Zaire:	.4 Million Tons Annually

Economics of Mining

Several external factors are important in assessing the possibilities and potentials for deep seabed mining. First, the market price of the four minerals found in the nodules must be considered. The effect of adding substantial amounts of each of the minerals to the world's markets could have a depressing impact on price. Most advocates of seabed mining contend that increased demand will prevent a price fall. Second, the impact of possible falling prices and the seabed competition for land-based producers must be assessed. Some of the land-based producers (such as the African nations) are very

dependent on their mining revenues. Additionally, some of these producers are marginal producers, in the sense that a drop of price would make their output unprofitable. There are provisions in the Treaty that would work to protect such land-based producers, such as limits on the production level and number of deep seabed mining stations. Third, the growth implications for each of the minerals must be considered. Will substitutes be found for each of the minerals? Will increased use support additional mining activity in an open marketplace? Given the likely growth patterns of the world's economy, it is generally assumed that there will be an increased demand for the minerals (see annexes for estimates of demand growth). Fourth, environmental impact on the oceans and particularly on the deep seabed must be considered. Some oceanographers predict grave problems if development on the deep seabed is not carefully monitored and controlled. For example, the migratory patterns of major species of fish could be disrupted by major mining operations. Fifth, the cost and availability of the advanced mining technology must be considered. While much of the actual mining technology has

been produced and is workable, the additional infrastructure necessary to transport and process the minerals has not been fully developed. Finally, the impact of the LOS Treaty must be considered. This is really part of a larger question that surrounds the desirability for a legal, globally recognized regime of the oceans that can control the mining actions in a structured fashion.

As discussed earlier in the dissertation, the U.S. has opted not to sign the Treaty, and is currently developing a means for its miners to work without the benefits of the U.N.- sponsored ocean regime. This state of affairs has an overwhelmingly negative impact on the potential for investment and operations by the other industrial mining concerns, primarily from the industrial world.¹⁵ The feeling among many industry analysts is that the ocean regime will remain uncertain unless the major industrial countries and particularly the U.S. join the Treaty. Such a state of uncertainty discourages conservative investors, such as banks and insurance houses.

OMCO, the California-based consortium discussed in the previous chapter, has recently "scaled down its mining

¹⁵ Marne Dubs, Strategic Planner, Kennecott Copper, Interview, Kingston, RI, June, 1982.

research and development," according to their senior Vice President. Another of the major consortia, Kennecott Copper's deep seabed mining group, has shut its San Diego office, which handled the Pacific operations for the firm. These and other industry actions are a reflection of the growing uncertainty surrounding the ocean regime, as well as the overall depressed market for the deep seabed minerals, linked to the 1981-82 global recession, which is only now (1983) showing signs of recovery. All of the firms are continuing research and development, but the current legal situation (as well as the metals market) is having a negative impact on investment prospects. Both the legal and the economic situations will have to be resolved before mining will take place.

Over the long term, deep seabed mining will become economically and technically sound, although earlier predictions of some experts that mining would be a common occurrence by the mid-1980s appear unlikely today. The best scenarios that can be envisioned for the industry entails a further development of technology during the decade of the 1980s, a wait for the ocean regime to settle

itself out, and a gradual revival of industrial demand for the products of the deep seabed. Serious mining, led by a demand for nickel and copper, will probably begin sometime¹⁶ in the late 1990s, with a new generation of technology.

¹⁶This was the general view espoused by a wide range of commentators at the University of Rhode Island's Conference on the Law of the Sea, June, 1983, Kingston, RI.

C. Deep Seabed Mining Technology

As Robert W. Knecht, the noted senior scientist of Woods Hole Oceanographic Institute recently commented, "Recovering minerals efficiently from the deep seafloor is not gong to be an easy task."¹⁷ Another observer has likened the task of raising the nodules to " . . . standing on the Empire State Building and picking up marbles from the street through a long straw."¹⁸ Some of the problems include the following:

- Pressure in the areas (14,000-18,000 foot depths) of mineral deposits is immense, enough to crush normal, sea-level mining machinery.

- The salinity of the deep seawater has an extremely corrosive effect, particularly since the gear is continuously immersed at such depths.

- The weight of the nodules, in the tonnage required for economically feasible operations, requires an enormous amount of energy to bring it to the surface.

¹⁷Robert W. Knecht, "Deep Ocean Mining," Oceanus, Fall, 1982, pp. 3-4.

¹⁸Robert W. Knecht, Interview, Kingston, RI, June, 1983.

These problems are only the beginning for the serious investor interested in the deep seabed. There are five major phases in the total mining operation, each with its own challenges:

1. Exploration: Finding the deposits in sufficient quantity to justify the expense of the mining operation.
2. Mining & Collecting: Gathering the nodules from the floor of the area.
3. Lifting: Raising them to the surface, several miles above.
4. Transport: Moving the nodules from the site to the processor.
5. Processing: Extraction of the manganese, cobalt, copper, and nickel from the ore.

There are currently four basic types of systems envisioned for the collection of the nodules. These are the mining technologies which most commercial miners have investigated to date. They include:

- 1 Continuous Loop Dredge: This system consists of a continuous line of buckets which are attached to a cable hanging in a loop from a surface ship. By moving the ships

¹⁹ Ibid.

²⁰ These systems are described in a generic sense. The best sources of information on the systems include interviews with the Woods Hole staff and Jane's Ocean Technology.

on the surface, the buckets are dredged across the bottom of the seabed, dislodging and scooping up the nodules. The nodules are then brought to the surface by the looping action of the bucket series. This was an early design, clearly based on fundamental principles of harbor dredging, and is very indiscriminate in what comes up from the bottom.

2. Vacuum Collection: This system would use compressed air provided by a series of hydraulic pumps to vacuum the nodules off the sea floor and "pump" them upward through a long, single connecting tube to the ship above.

3. Crawl and Crush: Patented by Ocean Minerals Company, this system would utilize a miner-vehicle crawling across the seabed, collecting the nodules. It crawls on two large "Screw Tracks" attached to the bottom of the miner-vehicle. The vehicle itself crushes the ore and mixes it with seawater to form a slurry, which is then "pumped" to the surface ship via a rigid pipe section.

4. Sea Shuttles: Developed by the French deep seabed mining consortium, this last system would include a small fleet of mini-shuttles scuttling across the seabed,

gathering nodules. The shuttles would be acoustically controlled and directed, and would deposit their loads of ore with a series of platforms floating in mid-depth (7,000-10,000 foot) water, where they would be transported to the ship above.

These technologies represent the known level of research being carried on by several industrial consortia, representing primarily the western countries.²¹ The background and composition of each of the consortia were discussed in the preceeding chapter. As a general comment, each of the "big four" (INCO, OMCO, OMA, Kennecott) is working toward a scale model prototype to test the possibility of full scale mining.

INCO has operated a ship, the SEDCO 445 which has successfully recovered nodules from 18,000 to 26,000 feet. INCO has also tested an air pressure operated vacuum collection system and a manned nodule collecting seabed vehicle.²²

OMCO has patented a "Crawl and Crush" system for seabed mineral recovery and is currently operating two ships, the Glomar Explorer and the Governor Ray. Both of

²¹Jane's Ocean Technology, "World Deep Ocean Nodule Mining," 1982-1983 (London: Jane's Publishing Co., 1983), pp. 750-754.

²²Ibid.

the ships are actively involved in research and development. Some of the systems tested include sampling and survey, free-fall samplers, corers, towed dredges and cameras, wet and dry laboratories, and electronic navigation and sonar systems. The collection system is capable of operating in water depths from 15,000 to 20,000 feet, and brings the nodules through a one foot diameter pipe to the surface. The firm is now working on establishing a working model for Hawaiian waters that will be able to process up to 50 tons/day.²³

OMA is currently operating two major research ships, the R.V. Prospector and the Deepsea Miner II. They have been able to raise over 50 tons/hours in testing situations, through a 7 inch diameter pipe from depths of 15,000 feet. The Deepsea Miner II was the vessel used for the experimental system, and would have to be enlarged considerably before becoming profitable. OMA has also designed a working processing system, which first crushes the nodules and dries them to expose their large surface area for reaction. Hydrogen Chloride is then used as a reactive agent, along with heat and complex electrolytic²⁴

²³Ibid.

²⁴Ibid.

processing to extract the nickel, cobalt, and copper. The impurities of cadmium, zinc, and chromium are removed, leaving a solution of manganese chloride, which is finally reduced to pure manganese. A commercially usable by-product of the reaction is chlorine.

Environmental effects of the technology are little understood to date. The principle source of worry will be the huge amount of waste and by-product that will result from the processing of the minerals from the deep seabed ore. Since 70% of the 5500 tons/day will be rejected, the disposal of such "tailings" poses a significant problem for the industry. Several studies, however, indicate that the oceans can absorb most of the by-products without significant environmental damage.

D. Polymetallic Sulfides

In the global excitement over manganese nodules, another source of valuable minerals from the seabed is often overlooked---polymetallic sulfides. These mineral deposits are formed in areas of active hot springs operating under the ocean's floor, such as in the Red Sea, off the coast of Washington state near the U.S., and in other so-called "ocean rifts." Heated seawater, (carrying large amounts of dissolved metals and sulfur) gushes up from the seabed, forming "clouds" of minerals underwater. The dissolved metal and the sulfur combine into polymetallic sulfides. The compounds form "cones" or "chimneys" on the ocean floor, which can be mined in much the same manner as the manganese nodules on the deep ocean floor. The metals discovered in such cones include zinc, iron, copper, lead, silver, and others. Significantly, the polymetallic sulfides tend to occur in much shallower waters (8,000 feet or less) and form much faster (under a hundred years) than do the manganese nodules.

²⁵R. Koski, W. Nomark, J. Morton, J. Delaney, "Metal Sulfides Deposits on the Juan de Fuca Straits," Oceanus, Fall, 1982, pp. 42-48.

It is unknown as yet when the polymetallic sulfides decay, if at all, after their formation. Extensive scientific exploration has been going on for the past few years to determine the commercial viability of the sulfides. They are very interesting to miners because their mineral/metal content is twice as high as the ⁶⁶ 26 nodules.

Saudi Arabia and Sudan have formed a joint commission for the purpose of mining the polymetallic sulfides located beneath the Red Sea Brines (heavy salt deposits) at the bottom of the Red Sea. These hot salty pools on the sea's floor create the same sort of conditions that exist in the Pacific rifts, and the high salt content of the water precipitates metals into compounds on the sea bottom. A West German firm is undertaking the mining, which consists of bringing up mostly mud and deposits, which are then processed onboard the ship. The concentrates included a remarkably high 40% zinc, with "lesser quantities of silver, copper, and gold," according to Erich Blissenbach, ²⁷ Ocean Mining Coordinator for the test. The process was conducted as a test, and the firm hopes to undertake a

²⁶ Conrad Welling, "The Future of U.S. Seabed Mining," Mining Congress Journal, November, 1982, p. e.

²⁷ Robert Knecht, "Deep Ocean Mining," Oceanus, Fall, 1982.

commercial project in 1984, if the mining company can design a pump that can withstand the corrosive effects of the brine and heat for any significant length of time.

E. Ocean Energy

One of the most critical needs of any economy, developing or industrial, is energy. As conventional sources of energy are depleted throughout the world, a growing emphasis will center on alternate forms of inexpensive, renewable energy. Some experts predict that ocean energy, broadly conceived, will be an increasingly important source in the future. The technology that allows the recovery of various forms of ocean energy will be extremely valuable. Ocean energy will be used in a wide variety of applications, one of which may well be in the processing of deep seabed mining, and it would therefore fall under the technology transfer portions of the Law of the Sea Treaty.

There are currently four basic conceptual methods of producing energy from the ocean, which will be examined in
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some depth below:

- Ocean Thermal Energy Conversion (OTEC)
- Wave Energy Generation

²⁸Robert Krueger, "The Promise of OTEC," Sea Technology, August, 1980, p. 10.

- Current Energy Generation
- Salinity Gradients

OTEC

Of these four methods, the most advanced means of energy production from the oceans is currently via OTEC, which has been demonstrated as practicable in a wide variety of tests conducted by several industrial concerns.²⁹ The basic principle of OTEC is using the difference in the warm surface waters of the ocean and the much colder deeper thermal layers to alternately vaporize and condense a working fluid (ammonia, water, or an air-water mixture). The motion of the working fluid is converted into mechanical energy in a turbine, which finally generates electricity. There are four basic forms of OTEC designs,³⁰ including:

1. Closed Cycle: Warm surface water vaporizes ammonia, which is then condensed by cold bottom waters. The movement of the ammonia is converted into mechanical

²⁹ Ibid., p. 11.

³⁰ T.R. Penney and B. Shelpuk, "An Overview and 1981 Progress Report on Open-Cycle OTEC Power," Sixteenth Annual Conference Proceedings of the MTS, 1981, p. 890.

energy, then into electrical powers, which is drawn off and utilized.

2. Claude Cycle: Similar to the Closed Cycle, but uses water as a working fluid. Fresh water is produced as a beneficial by-product, with seawater being continuously supplied as the raw working fluid.

3. Mist Lift: Warm surface water is directed from the upper levels of a large, inverted cone to the bottom, where it is "misted" by a hydraulic turbine. The water's thermal energy lifts it to the surface where it is condensed and expelled. The energy from the expansion of the water is converted into mechanical, then electrical energy.

4. Foam Lift: Similar to the mist lift, but the device uses foam with vapor bubbles to stabilize the two phase flow.

There is a fifth type of OTEC device, which uses the difference in temperature across a semiconductor thermoelectrical device that produces electricity by direct conversion using the Seebeck Effect.³¹ This method is considered far less practical than the others, however, and

³¹ Seebeck Effect produces a current through the result of Brownian motion stored across electrical components.

is not commercially feasible with current technology.

The United States, France, and Japan have all produced working OTEC stations, although on a small, prototype scale. Several advantages are normally claimed for OTEC over other forms of ocean energy production. First, thermal energy is more easily converted into electrical power which can be transmitted to land via already-in-place submarine cable systems. Second, if an ammonia system is used, further efficiency can be gained from the ammonia by-product. Third, the OTEC power is flexible and useful at sea, particularly as a power source for mining or processing of deep seabed minerals at sea. Fourth, the power can be stored in battery cells for use afterwards or for transportation elsewhere. Finally, OTEC energy is available 24 hours a day, throughout the year, and is not dependent on solar, current, or wave conditions for generation. It is renewable and inexpensive.

On the negative side, the OTEC installations, to be workable on a commercial scale, will be physically huge structures as currently envisioned. The large size is required in order to reach between significantly different

³²Robert Krueger, pp. 10-11.

thermal layers, which vary considerably in vertical separation. The LOS controversy itself has cast further doubt about the feasibility of OTEC as the placement of the installations will necessitate a sound international legal climate---one which the doubts over the Treaty has rendered problematic at the moment. Most of the installations, in order to take advantage of efficient thermal conditions, will have to be located beyond the EEZ. Finally, the funds needed to develop the first stations will be considerable, and as hydrocarbon fuels fall in price (as they have recently), the government and industry will be less likely to work at producing the OTEC stations. Eventually, of course, the price for hydrocarbon energy will rise, and OTEC will become more attractive. Continuing research will be focused on methods of reducing overall costs for the large, bulky hardware necessary for start-up.³³

Potentially, the use of OTEC energy systems offers a vast source of power. The ocean temperature differences (an average of 27 degrees surface versus 4 degrees at 1,000 meters, as average figures in viable regions) are available throughout much of the globe.³⁴ As testing and prototype

³³William E. Richards, "Ocean Energy Systems Progress," Sea Technology, January, 1980, p. 17.

³⁴Staff Report, "OTEC Leads the Way in Ocean Energy," Sea Technology, January, 1980, p. 18.

construction continue, the pressure for transfer of technology will intensify, especially where OTEC systems are used to power portions of seabed mining operations, an eventuality which appears likely. OTEC usage could ultimately include raw power generation, ammonia production (for its use in fertilizer and industrial products), and marine project support. There is considerable industry interest in the OTEC projects, but falling oil prices (as of late-1983) may slow production until the end of the decade.

Wave Energy

Another form of ocean energy that has great potential is Wave Energy Generation (WEG). The concept is extremely simple: The energy generated by the action of the ocean's waves is converted into mechanical energy by either a turbine or a pneumatic-hydraulic pump mechanism. There are currently four major types of wave energy generators under investigation. They include:

1. Refracted Wave Energy Devices

³⁵T.R. Penney and B. Shelpuk, p. 891.

2. Duck Method
3. Pneumatic Cavity Resonator
4. Raft/Ball Systems

Wave energy has a long historical process behind it, dating to the Middle Ages and the idea of a perpetual motion machine. Many of the older designs were workable, but none were economically feasible, especially when other sources of energy were all relatively abundant and cheap.³⁶ Oceanographers have surveyed the world's coasts for likely locations for the systems, which will be large in order to return a sufficient amount of power. Norway, England, Japan, and the United States have all pursued wave energy research, generally for offshore generation of power for land uses.

The four basic WEG devices are all simple in concept, although still relatively impractical due to size, cost, and low return of powers. Again, the lack of a legal regime of the oceans may have a negative impact on development of this technology, particularly in deep ocean/high seas situations.

1. Refracted Wave Energy Device: An artificial

³⁶ Staff Report, Sea Technology, p. 18.

"island" is semi-submerged just at the surface level, and its contours cause incoming waves to "focus" at the center of the structure. The waves are converted into a vortex by the shape, and the vortex drives a hydraulic turbine with a connected generator at the base. This design could be used to power at-sea installations, such as a seabed mining station.

2. Duck Method: A "wing" shaped structure that "bobs" up and down in the water is the centerpiece of this technique. The wing is turned around an axis by the wave action, thus generating energy, which is converted to electrical power.

3. Pneumatic Cavity Resonator: Waves are "captured" in a chamber where they resonate. The pressure variations cause an oscillating air flow that drives a pneumatic turbine. This system is also likely for use as an at-sea power station.

4. Rafts-and-Balls: A long, connected loop of rafts or balls is strung out through the ocean. The motion of the segments rocking against each other can be used to generate energy. As MIT designer Ford Ames has commented,

"It (WEG) could be used on drilling platforms and signal buoys. It could produce electricity for remote islands and be useful in aquaculture. It could even produce hydrogen (electrical separation of H and O from seawater) as a substitute for fossil hydrocarbon fuels."³⁷

Current Energy Generation

A third method of obtaining ocean energy is by tapping deep sea currents. Fairly consistent, forceful flows of water through various ocean regions could be exploited, given advanced technology and highly efficient methodology.³⁸ Only two basic designs are considered currently:

1. Flow Turbines: These are static mechanisms lowered into the current flow that employ conventional turbine technology to generate mechanical-electrical energy.

2. Motion-Cycle Systems: Using some chain of objects (drag chutes, balls, propellers, etc.) the current is allowed to drag the objects in a cycle, generating energy back at the base point.

³⁷"It's Handsome and It Works," Marine Resources Information Bulletin, November, 1982, Number 234, p. 2.

³⁸T.R. Penney and B. Shelpuk, p. 891.

Ocean current energy conversion has less appeal than either OTEC or WEG. It is more difficult to implant the energy gathering devices, harder to find the currents to begin with, the source energy is often lower, and the capital costs are higher. Generally, the devices will have to be used in deep ocean waters, beyond the reach of even the 200 mile national jurisdiction---and the projects are thus hurt by the lack of a consistent ocean regime. Insofar as technology transfer is concerned, this form of ocean energy would probably fall under the general provisions of the treaty, but not under the mandatory sections, since its applicability to deep seabed mining is minimal. This could change, however, if the technology were eventually used in providing support to deep seabed mining stations, which would make it part of the overall mining system.

Salinity Gradient Energy

A final method of obtaining direct energy from the oceans is by use of Salinity Gradients in the oceans.

These systems rely on the differences in salt content in the various layers of the ocean to generate electricity directly. The levels of electricity generated are very small, and the devices are not practical for use on stations much larger than small buoys today. The two major design types are Reverse Electrodialysis and Pressure Retarded Osmosis, neither one of which seems to have the potential for application to deep seabed mining or is of interest in technology transfer arrangements.³⁹

Overall, the Ocean Thermal Energy Conversion concept seems the most promising of the four basic approaches to generating energy from the sea. Its application to at-sea projects make it a prime contender for transfer of technology provisions in the LOS Treaty.

OTEC and Technology Transfer

"It is inevitable that OTEC technology will one day be traded like any other commercial commodity," commented Mr. Frederick E. Naef of Lockheed, Inc. recently. Lockheed is one of the pioneer firms involved both in OTEC and deep

³⁹T.R. Penney and B. Shelpuk, p. 891.

seabed mining, an interesting and symbiotic pair of research and investment interests for the corporation.⁴⁰ OTEC is of primary interest to the developing economies for several reasons. First it is cheap, clean, and renewable. Second, it is essentially solar energy reclaimed from the ocean (solar action on the surface of the sea is the source of the critical temperature gradient), and thus is particularly efficient in the regions of the world between 20 degrees latitude North and South of the equator---where many of the LDCs are located. Finally, it is an energy source that is not controlled by either OPEC or the industrial world, once the technology is available. OTEC has thus become one focus of many developing nations as a practical instance where the technology transfer provisions of the LOS Treaty, the NIEO, and the evolving Code of Conduct on Technology Transfer can be applied with some effect. The United Nations has sponsored an ongoing series of conferences on new and renewable sources of energy (UNERG). These have emphasized the advantages of OTEC for the developing world, although there has been suspicion by some smaller countries that OTEC is being "foisted" on them

⁴⁰ Frederick E. Naef, "The Development of Ocean Energy in the Third World," Sixteenth Annual Conference of the MTS, October, 1980, p. 336.

in order to preserve hydrocarbon energy for the industrial
⁴¹
 economies.

As discussed earlier, the uses of OTEC in the near-term are fairly small. There is some limited application to land power grids, notably on islands; at sea projects, such as seabed mineral mining and processing; and production of some industrial products. The table below summarizes the uses and products of OTEC:

Applications:	Grid Power	Electro- Chemical	Electro- Metal	Other
Products:	Electricity	Ammonia Hydrogen Alkali	Aluminum Titanium Manganese	Water (Fresh)

Mr. Naef, quoting other industrial firms involved in the OTEC technology (the U.S., France, Japan, and the Netherlands are all subsidizing research), has commented that, "Supporting these considerations (i.e. technology transfer via joint venture) is in the mutual interest of all nations . . . "
⁴²
 He has mentioned the concern of the developing world that a shift to OTEC energy could place

⁴¹Ibid., p. 335.

⁴²Ibid., p. 336.

them in a position of dependence on western/industrial technology, and mentioned the possibility of developed countries using OTEC profits to support maritime industries in their home lands.

Naturally, the LDCs envision a more automatic transfer of the OTEC technology. If OTEC is used to power deep seabed mining stations, the technology may well fall under the mandatory transfer provisions of the LOS Treaty.

F. Advanced Fishing Technology

A growing percentage of the world's protein comes from fishing. Total world catch is in excess of 100 million metric tons annually, of which the overwhelming majority (80% or more) is caught at sea.⁴³ Estimates of the amount of food that could eventually be harvested from the sea range "from 200 million to a potential of 7.2 billion tons, with an acceptable figure of 400 million metric tons."⁴⁴ Additionally, "trash fish", (fish caught but not considered acceptable for sale) can be processed into a "tasteless, odorless powder" called Fish Protein Concentrate (FPC). This powder is 75% protein, and 1 pound is the equivalent over 5 pounds of beef or 2 pounds of dried milk. It is inexpensive, portable, and acceptable as a dietary supplement in most cultures. It is interesting to note that virtually all of the fish harvested from the sea today are obtained through essentially primitive hunting methods. Man has taken the step from hunting to farming ashore long

⁴³George A. Doumani, Ocean Wealth (Rochelle Park, NJ: Hayden Book Co., 1973), pp. 32-33.

⁴⁴Ibid., p. 33.

since; but the age of "farming" at sea, a technique broadly known as "aquaculture" has not come of age. Advanced fishing techniques are still focused on improving the "hunting" aspects of harvesting fish from the sea, although aquaculture research is growing in many advanced industrial countries.

Fishing has been divided into sixteen categories by the U.N. agencies that study marine affairs. These⁴⁵ include:

- | | |
|--------------------------------|--------------------------------|
| 1) Fishing without gear | 9) Seining |
| 2) Grappling and wounding gear | 10) Fishing with surround nets |
| 3) Stunning | 11) Driving fish into nets |
| 4) Line fishing | 12) Fishing with lift nets |
| 5) Trapping | 13) Fishing with falling gear |
| 6) Trapping in the air | 14) Gillnetting |
| 7) Fishing with bag nets | 15) Fishing with entangle nets |
| 8) Dredging and trawling | 16) Harvesting machines |

These are mentioned only to show the diversity with which man approaches the problem of obtaining fish from the waters of the world. Most of the world's fishing is still conducted by very primitive methods, mostly centered around crude forms of dredging and trawling.

Given the vast potential for protein from the sea, both

⁴⁵ Al Blott, Fisheries Engineer, National Maritime Fisheries Service (NMFS), Interview, Kingston, RI, March, 1983.

from "hunting" and from aquaculture, the developing countries have proven themselves very anxious to obtain the requisite technology to upgrade their operations. The LOS has specific provisions dealing with the transfer of fishing technology, although the provisions deal with the subject in the context of conservation. Article 119 says, for example, "Available scientific information, catch and fishing statistics, and other data relevant to the conservation of fish stocks shall be contributed and exchanged on a regular basis through competent international organizations."

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In many ways, the controversy surrounding the transfer of fishing technology is a small one. While some in the industrial countries contend that the oceans are in grave danger of over-fishing, most observers agree that with effective management, fishing can continue to be virtually open on the high seas. The developing countries view the harvest of living resources as another part of the "common heritage" of all mankind, and believe that the technology that makes large "harvests" possible for advanced fishing states should be transferred to them in order that they may

⁴⁶LOS, Article 119, p. 54.

also share the bounty of the sea.

There are problems with wholesale transfer of such technology, however. As Al Blott, a fisheries engineer with the U.S. Department of Commerce and the National Marine Fisheries Service recently commented, "There are problems with modern fishing technology suddenly being given to the Third World. Everything breaks down, and I don't mean just the gear. The basic sociological patterns of a fishing culture can be overwhelmed by some of the more advanced methodology."⁴⁷ Most LDCs, however, seem willing to take that chance and want the advanced fishing technology now.

Most of the recent advances in fishing technology are follow-on inventions flowing naturally from centuries-old practices. Some of the most important include:⁴⁸

1. Data Collection and Management: One of the critical advantages the advanced fishing countries possess over the developing countries is in the area of simple data collection and sophisticated analysis of fishing trends. Such organizations as the National Maritime Fisheries Service in the U.S. are typical. As Tom Shadayzut, a

⁴⁷Al Blott, Interview, March, 1983.

⁴⁸Tom Shadayzut, Fisheries Engineer, NMFS, Interview, Kingston, RI, March, 1983.

fisheries assessment specialist at the NMFS commented, "Our job is to manage the fish for the benefit of the United States."⁴⁹ In a recent letter to the U.S. Congress, William G. Gordon, Assistant Administrator for Fisheries with the Department of Commerce, explained, "We have four goals: (1) Conserve and manage marine recreational and commercial fishery resources; (2) Contribute to the stability and growth of the nation's fishing industry; (3) Conserve marine animals and endangered species; and (4) Conserve marine environments that sustain our valuable living marine resources."⁵⁰ In order to accomplish these goals, the NMFS provides a vast scientific and financial support resource for U.S. commercial fishermen, an advantage certainly not shared by most fishing competitors from developing economies.

The most recent publication of the NMFS chronicles over 20 single-spaced pages of research projects adding up to hundreds of millions of dollars in advanced fishing research granted to U.S. fishermen. Projects range from development of sound and ranging (SONAR) techniques to locate and count fish to checks on the reproductive cycles

⁴⁹ Al Blott, Interview, March, 1983.

⁵⁰ Mr. William G. Gordon, Department of Commerce, Letter, February, 1983.

of important species. Each of the major fishing powers--- U.K., Japan, U.S.S.R., Poland, Norway, Denmark, etc.---have comparable organizations that bring the weight of the industrial governments behind fishing activities in their respective countries. Japanese activities, for example, are "vast" compared to U.S. activities.⁵¹ The work of such organizations extends not only to the scientific, in the form of research and development of new and improved fishing technology; it also provides financial help in the form of loans, informational publications, lobbying with individual governments over fishing rights for their nationals, and locational information on particular fishing areas. The national fishing services also provide some relief from foreign fishermen who intrude into a country's home waters, via police powers. Overall, the force of the national fisheries organizations is a powerful advantage for the nationals of the individual countries with such groups.

2. Acoustic Techniques: In addition to information and support from national fishing groups, various advanced technologies are also available to fishermen from the

⁵¹Al Blott, Interview, March, 1983.

advanced countries. One of the most important is the use of SONAR equipment. First developed as an outgrowth of military research during the First World War, the technique of using sound waves underwater to locate underwater objects (such as submarines or schools of fish) has been an integral part of fishing technology for fifty years. In recent decades, however, it has become extremely advanced. The Japanese in particular have refined the use of underwater SONAR stations in fishing situations. The use of advanced design ceramic components, high powered sound waves, both active and passive detection systems, and even color displays has been a crucial advantage for deep water
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fishermen.

3. Automated Long Line Fishing: Led by Norway, many advances in recent years have been made in automated long line fishing. This includes advancements in the laying of the long cable, the automated setting of baits, automatic control systems to check the individual lines, and power winches for reeling in the catch. While the long line as a technique is a very old one, the advances in technology that have evolved from adding automation have increased its

⁵² Sonar Notes, U.S. Navy Instructional Publication (San Diego, CA: U.S. Navy Printing, 1977).

efficiency by several fold.

4. Buoy Usage: In addition to automated techniques in long line fishing, some of the advanced fishing countries have added a capability of using fully automated buoy systems for fishing. These include unmanned, floating objects at sea that have a collection of lines fanned out around them. The lines are tended by the mechanisms on the buoy themselves. The technique is to "lead the fish" to the netted areas rather than catching them by dragging the nets through the water. Periodically, the buoys are harvested by fishing boats with specially designed gear.

5. Fuel and Drag Efficiency: Improvements in the efficiency of the fishing boat engines and hulls have constituted an advance that has become increasingly important as fuel costs have risen. More importantly, drag efficiency on the nets used for most deep sea and coastal fishing activity has been improved via laboratory study. This has led to new techniques for catching the fish, including the concept of "herding" them, often using very efficient, large mesh nets. The fish are led into the net rather than caught in it as it is dragged through the

water. Some nets are nothing more than a series of lines played out in the water that attract the fish into them. This is part of the revolution in trawling (dragging nets through the water to catch the fish) that has swept the advanced fishing countries in the past decade. The newer techniques are utilized as part of what is termed "mid-water trawling," which is using nets in moderate depths with a large mesh density.

Fishing and Technology Transfer

Overall, fishing technology occupies a "gray" area between mandatory transfer and encouraged transfer of technology. It is not clearly mandated for transfer in the same sense that deep seabed mining techniques and equipment are in Annexes II and Part XI. On the other hand, it is referred to, somewhat obliquely, as "scientific knowledge" in the specific provision dealing with fishing on the high seas. It is somewhere beyond the mild "encouraged" section of the treaty but not definitively so. The first case of a developing country requesting advanced fishing technology

from an industrial country under the provisions of Article 119 should be an interesting one, and a likely case for the first session of the LOS Tribunal.

Perhaps more significant in the context of possible mandatory transfer of advanced fishing technology is the precedent of the deep seabed mining portions of the Treaty. Living resources of the oceans could eventually be conceived of as part of the "common heritage" of mankind. If that is the case, there is a certain logical connection between the transfer of seabed mining technology (based on its use in exploiting the "common heritage") and the eventual transfer of fishing technology (likewise used in exploiting the different portion of the "common heritage.") At the present time, however, it seems that fishing technology will remain somewhere in a gray area, unlikely to be involved in mandatory transfer of technology decisions for some time.

G. Artificial Islands

The construction of artificial islands, a practice with a long history in offshore applications, has a major potential impact on marine technology. Such islands represent an answer to problems with environmental concerns, availability of large land tracts, and location of sensitive industrial complexes, both in the immediate offshore and the deep ocean regions. Since one function of such structures would eventually be landing and processing of deep seabed mining operations, the technology involved in the construction and design of artificial islands will eventually fall under the mandatory technology transfer provisions of the LOS.

It is possible to foresee eleven major potential uses
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for artificial islands:

1. Deep seabed mining/electrochemical processing
2. Petroleum refining

⁵³Robert Biggs, "Artificial Multipurpose Industrial Port Islands," Technology Assessment and the Oceans (Monte Carlo: Proceedings of the International Technology Assessment Association, 1975), p. 170.

3. Petrochemical manufacture
4. Electric power generation (Nuclear/Conventional)
5. Deepwater shipping terminals
6. Liquefied Natural Gas regasification
7. Urban solid waste processing (Toxic Waste)
8. Fertilizer manufacture
9. Paper manufacture
10. Steel-making
11. Nuclear fuel reprocessing

Of these candidate uses, the most likely prospects for viable uses of artificial islands, according to Dr. Robert Biggs of the College of Marine Studies at the University of Delaware include the following:

1. Deep seabed mining processing and landing:

According to industry analysts, the size and weight of deep seabed mining ores will be very large in an economically feasible system---up to 5500 tons per day at a typical site.⁵⁴ The port facilities, cranes, and logistical movement devices, and track systems within the processing complex will be large and cumbersome. To utilize an existing port would place a tremendous strain on the

⁵⁴Robert Biggs, p. 170.

⁵⁵Conrad Welling, "The Ships and the Ports," Stockton's Port Soundings, October, 1980, p. 4.

ability of that port to handle its normal traffic of shipping and docking. Thus, artificial islands become an ideal location for such a processing and offloading installation.

2. Oil Refining: Particularly as more oil is recovered from the offshore regions of the world's oceans, the refining capability will need to be located near the coasts for most efficient operations. The emissions and air quality, danger of fire and explosions, land use conflicts, possibility of oil spills, and aesthetics of unattractive refining facilities might well preclude installations in coastal ports. The answer could be to construct artificial islands, a solution that would mitigate or remove all of the aforementioned problems.

3. Nuclear Power Generation: Growing global activism in environmental issues has focused on the dangers of nuclear power over the past decade, despite the general efficiency, renewability, and cleanliness of nuclear power as a source of electricity. The problems caused by fear of radiation leakage or nuclear explosions near population centers might be overcome by locating nuclear power plants

on artificial islands and connecting them with the shore-based power grids via submarine cables. This might ease the controversy over public rejection of many power plants. Additionally, the ocean could function as a geographical barrier not only in a risk-prevention sense for the populace, but also give some degree of protection from sabotage as the water area forms a natural exclusion zone around the plant. Finally, the ocean could be used as a heat sink for the high-temperature cooling water. It is possible to envision the use of the discharged water being harnessed via an OTEC system, thus further increasing the efficiency of the plant.

4. Nuclear Fuel Reprocessing: Spent fuel from a nuclear reactor is a dangerous, difficult-to-destroy substance. While reprocessing is possible, the techniques are hazardous and politically unacceptable to many communities. In addition to radiation problems, large land areas are tied up in forming exclusion zones and security problems stemming from theft of spent plutonium (a key ingredient in nuclear weapons) are rampant. The isolation afforded by an artificial island structure could solve many

of these problems by effectively isolating the reprocessing facility from population centers.

5. Petrochemical Manufacture: Manufacturing petrochemicals is a polluting, dangerous business. Problems include the aesthetics of the plant, land use conflicts, hazardous emissions (acid rain), impact on local air quality, danger of fire and explosion, and transport of feedstocks. Artificial islands might provide some relief to the problems raised with petrochemical refining plants, although the pollutants would still be entering the atmosphere, only over the oceans instead of the land.

One of the most interesting aspects of artificial island design is the concept of building an island that would combine many of the above functions in an efficient "processing center." Such an island could take in raw materials, such as deep seabed ore, offshore crude, nuclear ore, etc. It would use energy generated locally (on the island) from either nuclear power or an OTEC system, and would process the raw materials in a variety of ways. The output of such a processing station would be finished fuels, metals, minerals, etc. All would be ready to be

shipped ashore and used in industrial economies. Most of the diseconomies of the processing would be mitigated by the at-sea location of the function. As a sort of industrial combine, the idea is extremely viable, particularly if societies continue to be interested in the idea of paying for a cleaner environment, which seems likely.

One firm, Gilbert Associates, Inc., "has developed the needs for area, workers, utilities, and raw materials for an industrial island with a refinery core. The total size of the island might be less than 8 square kilometers, with a total employment of around 1,600 men and women working eight hour shifts. The inflow---outflow of the processing center might appear as follows:

INFLOW	OUTFLOW
Deep seabed minerals (ore)	Manganese, Cobalt, Copper, Nickel
Crude Petroleum	Gasoline, Jet Fuel, Feed Stocks
Potash	Fertilizer
Phosphate	Salt
Refuse	Recycled Paper
Fish	Processed Seafood Protein

All the processing would be interlocked, using output

⁵⁶W. Yesh, Gilbert Associates, Interview, New York/Boston via Telephone, January, 1977.

from one source as raw materials in the next, with internally produced energy supplying all requirements.

Construction of such an artificial island is technologically within the capabilities of the advanced industrial countries. In particular, Japan and the Netherlands, both land-poor countries, have constructed⁵⁷ either prototypes or working islands to date. The U.S. has also financed research and constructed a prototype. The basic methods of construction include:

- | | |
|-----------------------------|--------------------|
| 1. <u>Unprotected Beach</u> | 5. <u>Caissons</u> |
| 2. <u>Polder</u> | |
| 3. <u>Dike and fill</u> | |
| 4. <u>Sheet Pile Cell</u> | |

Of these, the last three are considered the most likely for open-ocean installations. Consideration in selected location must be given to the likelihood of seismic action (earthquake, underwater volcanic action, etc.), proximity to shipping and air traffic lanes, tides, storms, waves, currents, weather, fog ice.⁵⁸

⁵⁷J. Bonasia, F.R. Harris, Inc., Interview, Washington/New York via Telephone, March, 1977.

⁵⁸Robert Biggs, p. 173.

The typical construction would be circular to provide maximum deflection of a wave attack and full opportunity for extended wharfage. The possibility for a channel through the center of such an installation in order to provide easier access for the various functions would be likely. Access to such an island would be via aircraft, small boat, tanker, barge, and hydrofoil. If the island were constructed near the mainland, the concept of a vehicular tunnel would be attractive for entry/access of workers. The cost of such an installation would approach \$2 billion in 1983 dollars, but could eventually be economically feasible, particularly if environmental factors were taken into account in cost-benefit analysis.

Artificial Islands and the Law of the Sea

The current version of the Law of the Sea Treaty deals with artificial islands, but focuses on their role in the territorial waters and continental shelf/EEZ of the countries constructing them. In particular, the constructor must give "due notice" of the construction of such an island. Reasonable safety zones may be established

around such islands. The Treaty gives a maximum distance of 500 meters around the islands, and specifically denies claims of ownership to such installations. The islands cannot be constructed in or near shipping lanes, and all ships must respect the safety zones. The treaty is very clear on one point: "Artificial islands, installations, and structures do not possess the status of islands. They have no territorial sea of their own, and their presence does not affect the delimitation of the territorial sea,⁵⁹ the exclusive economic zone, or the continental shelf. Clearly, the drafters were concerned with the possibility that the construction of such structures might be used to extend jurisdiction or control over otherwise open sections of the oceans.

Artificial Islands and Technology Transfer

The technology involved in the construction of artificial islands is quite valuable, although not overly secretive. From the standpoint of technology transfer, the key element will be the function of the artificial island.

⁵⁹LOS, Article 60, p. 27.

If the island is involved in the processing of deep seabed minerals, the technology involved in the construction, installation, and design of the island could fall under the mandatory transfer provisions of the seabed mining provisions of the Treaty, under some interpretations. Technology on the island, other than the seabed ore processing sections, should not be liable for mandatory transfer, although it will fall under the "encouraged" clauses of the Treaty as a basic marine technology. The technology involved in the complex arrangement of core refining and processing center construction will probably not be construed as part of the "mining system", although an extremely liberal interpretation of the Treaty could (and probably eventually will) include it.

H. Maritime Production of Oil and Natural Gas

The production of oil and natural gas from the maritime environment is a rapidly growing global enterprise. Offshore oil and natural gas installations dot the coasts of many countries throughout the world. Deepwater drilling and production are also rapidly moving from the testing and experimental stages toward full-scale exploitation. Taken together, the production of hydrocarbons from the marine environment will continue to be a critical industry driven by advanced technology. As energy becomes scarcer, developing countries will particularly want to gain the advanced technology that allows exploitation of both the offshore and the deepwater environment for hydrocarbons.

In 1980, maritime sources produced 22.8% of the world's total of crude oil, as well as 15% of the natural
60 gas. In the U.S. for example, over one million barrels

⁶⁰Offshore Magazine, 20 June 1981, p. 4.

per day of crude oil and 14 billion cubic feet per day of natural gas were produced. Of the remaining reserves of the territorial United States, fully 60% are located at

⁶¹ sea. According to some industry analysts, maritime production will provide 33% of the world's oil by the late 1980s and 50% or more by the mid 1990s.⁶² The technology involved represents an expensive investment for the developed industrial economies that have produced it. A single platform for rigorous North Sea environment, for example can cost as much as \$1 billion and take several years to build.⁶³ The operating costs are equally high, particularly given the difficulty of operations in some marine environments like Alaska or the North Sea.

The exploration and production of hydrocarbons in the marine environment is not a recent development. Oil wells were first drilled at sea in the mid-1890s.⁶⁴ Geological surveys, general exploratory techniques, and actual drilling methods are similar to those utilized on land. The major difference between land and sea operations, however, is in the type of facility used to support the drilling apparatus. These structures consist of five basic

⁶¹ Petroleum Encyclopedia, 1980 (New York: Praeger, 1980), p. 64.

⁶² Earney, F.C.T., Petroleum and Hard Minerals from the Sea, (New York: Winston Publishing, 1980), p. 36.

⁶³ Offshore Magazine, February 20, 1981, p. 70.

⁶⁴ "Undersea Drilling," Shell Corporation, 1977, p. 2.

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types:

1. Drillship: A floating vessel above the well site, secured by some form of mooring.
2. Jackup: A drilling platform jacked up above the water level from steel rigs placed on the floor of the ocean.
3. Steel or Concrete Platform: Similar to the Jackup, but more stationary.
4. Semi-Submersible: A vessel floating above the sea bottom, but that surfaces for portions of its operations.
5. Fully Submersible: A vessel that remains underwater and conducts its operations without surfacing.

The level of technology involved is very high, and closely held. As of 1980, the deepest depth of water in which active pumping was occurring was nearly 5,000 feet. Through 1980, 64 wells were drilled in water depths greater than 2,000 feet; four rigs are capable of drilling in 6,000 feet of water. Experts predict that exploitations of much deeper water is not far away. Some of the technical
advancements that have made this possible include:

⁶⁵Ibid., p. 5.

⁶⁶Ronald Geer, "Deepwater Drilling and Production Technology, Marine Technology Society Journal, July, 1982, pp. 8-10.

1. Dynamic Positioning: Eliminating the need for anchors and permitting larger rigs.
2. Wellhead SONAR re-entry: Permitting better drill sighting and lessening the need to reposition rigs.
3. Marine Riser System: Allowing the use of the rigs in deep water via more efficient tension and buoyancy systems.
4. Vastly improved satellite navigation

The trend is clearly one of increasing marine activity, as technology continues to improve and land sources of hydrocarbons are depleted. The leading industrial countries involved in advanced marine oil and natural gas production are the United States, the United Kingdom, Denmark, the Netherlands, and some of the OPEC countries.⁶⁷

The technological advances have come very quickly over the past fifteen years, particularly when illustrated by water depth in which successful drilling was undertaken: In 1965, the deepest well was in only 632 feet of water, in a relatively calm California enviroment; by 1979, wells

⁶⁷Ibid., p. 9.

as deep as 4,876 feet in stormy Canadian waters had been successfully exploited. As mentioned above, some rigs are now capable of operating in water depths well over 6,000 feet.

Most observers see drilling in up to 13,000 feet of water within the decade. Some experiments are going on now with specific ships, such as the Glomar Explorer. The limit of technology for fixed leg platforms attached to the ocean floor is rapidly being exhausted at around 1,000⁶⁸ feet. The newest technologies are focused on Guyed Tower platforms, which are moored to the seafloor by a series of leads, and Tension Leg Platforms, which are supported on the sea bottom, but are allowed flexibility in the tensioning legs. Another new technologic development involves subsea systems where the wells are drilled from a floating rig and completed on the sea floor. Production is then routed by means of flexible piping to a fixed or floating platform. The best recent example of this was in the waters off the coast of Brazil where the Garoupa group used an undersea manifold system to hold the crude produced from its offshore rigs.

⁶⁸Offshore Magazine, September 28, 1982, p. 45.

Ultimately drilling and hydrocarbon production will be possible in much deeper water. As Ronald Geer, a senior Shell engineer recently commented, "Opportunities and economics, not technology will limit deep water developments."⁶⁹

Another interesting aspect of deep ocean hydrocarbon recovery is the possibility of the construction of entire undersea complexes to conduct mineral recovery. Two Scottish scientists at Strathclyde University recently issued a report predicting the placement of such "Jules Verne" structures on the seabed. They would be powered by nuclear plants, supplied by submarine tankers, and extract oil, natural gas, and deep seabed minerals. The writers of the report, who contacted and surveyed over 150 different international oil and offshore drilling companies, expect such underwater atomic stations to be operational by 2020, and that deep sea hydrocarbon mining will begin by the year 2000. They cite the search for deep water minerals and hydrocarbons as the impetus for such construction.⁷⁰ Such installations would obviously incorporate highly advanced technology. Under the current Law of the Sea Treaty, such

⁶⁹Ronald Geer, p. 15.

⁷⁰"Bustling Undersea Projects Seen, A La Verne," Christian Science Monitor, 28 July 1983, p. 10.

technology would probably be liable for mandatory transfer under the Treaty, as will be discussed below.

Offshore Hydrocarbons and Technology Transfer

Overall, the transfer of marine hydrocarbon technology seems likely to remain in the "optional" or "encouraged" category rather than the mandatory one, at least in the near future. The technology is not associated with deep seabed mining at present, and the LOS Treaty contains no specific provisions dealing with hydrocarbon exploitation. The more likely course is that the developing countries will continue to build on the "common heritage" principle, trying to include hydrocarbon technology in the same package of other exploitative equipment and techniques. If the LDCs can successfully link hydrocarbon technology to high seas exploitation (a process that should be gradually made easier as drilling moves out beyond national jurisdiction), they might be able to shift the technology to the mandatory category. The reasoning would be

particularly effective when drilling begins to take place under the high seas, an event which should occur before the end of the century. As full-blown undersea exploitation projects are developed, including both hydrocarbon and mineral recovery from the "common heritage" area, the technology will be likely to fall into the mandatory category. At the present, however, the hydrocarbon equipment and techniques will remain under the section of the Treaty that merely encourages transfer, as opposed to mandating it.

New Developments

One of the most interesting aspects of deep seabed oil recovery is the recent series of advances in the production of new recovery platforms that can operate at extreme (10,000 feet) depths. Wayne Ingram, manager of Seafloor Engineers, a Houston based geotechnical consulting firm, recently commented, "Technically, we should be capable of going down to 10,000 feet within the next few years."⁷¹

The newest concept is the production of habitats that will remain submerged at depth, with permanent crews to conduct

⁷¹Ibid., p. 10.

pumping operations. One British firm, McAlpine Offshore, has already designed a prototype submersible that will house 30-50 workers at depths up to 3,500 feet. The system could pump some 100,000 barrels of oil. Such platforms, if operated on the deep seabed (which seems inevitable) will probably fall under mandatory technology transfer provisions.

IV. Technology Transfer

A. Introduction

One of the most interesting and ultimately controversial issues facing the negotiators during the long course of the Third United Nations Conference on the Law of the Sea (UNCLOS III) was the question of marine technology transfer. Throughout the fifteen years of general discussion and the eleven formal sessions, the subject of marine technology transfer was consistently under discussion. While there were periods when most of the major actors seemed in agreement over the textual provisions dealing with technology transfer, it was finally to prove a major stumbling block leading to the rejection of the Treaty by several major countries. The United States, under the leadership of the Reagan Administration, clearly stated that the final version of the Treaty contains provisions on the subject of marine technology

transfer that have contributed to the decision not to sign¹
the document.

This apprehension over the technology transfer provisions is shared by many other major Western powers, both signators and rejectors of the Treaty alike, as will be discussed in depth later in this chapter. The issue is an emotional one, and the debate was consistently colored by overtones of anti-colonialism, concerns over economic exploitation, welfare, wealth, and the broad overlay of the entire North-South dialogue.

In this chapter, the marine technology transfer issue will be explored in the context of the Law of the Sea negotiations. The discussion will draw upon the material presented in the previous four chapters, since it is impossible to separate the issue from its larger place in the overall ocean regime and the political economy of the entire Treaty process. The discussion here will include a thorough examination of the Treaty text that deals with technology transfer, definitions of the different forms of technology transfer that are espoused in the accord, and a history of the topic as it impacted on the overall Law of

¹Ronald Reagan, Presidential Statement, 8 July 1982.

the Sea Discussion. The heart of the discussion will be an examination of the technology transfer process in the Law of the Sea context from the viewpoints of four critical players: The Less Developed Countries (LDCs, developing countries, Third World); the Industrial Countries (the West, essentially the OECD group, including Western Europe, Japan, U.S., Canada, Australia, and New Zealand); the International Organizations (IOs); and the multi-national corporations and consortia (MNCs, corporations).

Each of these actors has a fundamental interest in the technology transfer process in the Law of the Sea context. An effort will be made to understand the requirements and objectives of each of these key actors, and each of their individual positions will be analyzed in the context of the Law of the Sea negotiations. It is important to acknowledge at the outset the difficulty of representing, as though it were a single viewpoint, the ideas, aspirations, and demands of such complex blocks. Yet it is possible to draw certain general conclusions that hold true over the range of most actors in the groups.

The ultimate objective of this chapter of the

dissertation will be to draw together all the material of the foregoing four chapters, combine it with this in-depth analysis of the technology transfer issue, and lay the groundwork necessary to draw meaningful conclusions to the primary research questions discussed at some length in the introductory chapter. The first question is: How important was the issue of marine technology transfer to the emerging ocean regime and the Law of the Sea Treaty? The second question is: What are the implications of the technology transfer regime as it finally evolved for policy planners and how could it be improved (if at all) in order to induce full Western participation in the Treaty? In this fifth chapter, the objective is to complete the process of placing the factual information and the views of the major actors before the reader, before beginning to assess the issue and determine conclusions and recommendations in regard to national ocean policy.

It should be emphasized at this point that the initial sections of this chapter will seek only to elucidate the basic stance of the major actors. In subsequent portions of this chapter, an attempt will be made to analyze and

comment on the positions of the actors. The positions will be compared and contrasted in the course of drawing final conclusions and formulating recommendations for improving the Treaty text in the final two chapters.

B. Definitions

Technology transfer, on the surface at least, seems a straightforward matter. Technology itself is defined by the Treaty as "the specialized equipment and technical know-how, including manuals, designs, operating instructions, training, and technical advice and assistance necessary to assemble, maintain, and operate a viable system and the legal right to use these items for that purpose on a non-exclusive basis."² This is a rather sweeping definition, and it is appropriate to keep in mind the oft-repeated distinction between science ("know why") and technology ("know how").³ The term "Marine Technology" has also been defined by the United Nations as "(a) hardware, (b) operating procedures, (c) maintenance procedures, (d) operating and maintenance skills, and (e) management capacity used in man's attempts to control or adapt to the ocean environment by means of rationally

²LOS, Annex III, Article 5, Paragraph 8, p. 162.

³Joseph S. Szyliowicz, "Technology, the Nations State," Technology and International Affairs (New York: Praeger, 1981), p. 5.

organized systems of operations."

"Transfer of Technology" is not specifically defined in the Law of the Sea Treaty, but can safely be taken to mean simply the passing of technology from one party to another. In one recent version of the Code of Conduct developed by UNCTAD (the Code is still under negotiation, and will be more formally discussed in section D. of this chapter), "transfer of technology" is defined as: " . . . the transfer of systematic knowledge for the manufacture of a product, for the application of a process, or for rendering of a service, including managerial and marketing technologies, and does not extend to the transactions⁴ involving the mere sale or lease of goods." One other observer has defined "transfer of technology" as "the sale of methods and equipment, training of personnel, licenses to use patents, proprietary information and know-how, and⁵ other agreements between supplier and user."

Finally, it is important to distinguish at the outset between two different technology transfer sub-regimes in the Law of the Sea Treaty. The first, as indicated previously, is established in Part XIV of the Treaty,

⁴UNCTAD Code of Conduct, TD/CODE TOT/14, Chapter 1, Paragraph 1-2, (2).

⁵Homer Blair, Vice President of ITEK Corporation, Interview, Lexington, MA, March 1982.

"Development and Transfer of Marine Technology." This section, generally speaking, merely encourages states to transfer technology. It is relatively uncontroversial and innocuous, as will be discussed in depth below. This might be referred to as "encouraged" technology transfer. The second sub-regime is associated specifically with deep seabed mining and the exploitation of the Area (the seabed beyond the limits of national jurisdiction). It contains provisions that make it possible for mandatory technology transfer to occur between mining concerns and the Enterprise of the International Seabed Authority. These provisions are contained in Part XI, "The Area" and in Annex III, which details the arrangements for deep seabed mining, and are highly controversial in nature. Throughout this chapter, they will be referred to as "mandatory" technology transfer provisions. In the next section of this chapter, the specific textual references to technology transfer, both "encouraged" and "mandatory" will be provided.⁶

⁶The distinction between "encouraged" and "mandatory" was suggested by Jon Jacobson, Professor of International Law, University of Oregon, Interview, Newport, RI, June, 1983.

C. Technology Transfer in the Treaty Text

Encouraged Transfer of Technology

Part XIV of the Convention is entitled "Development and Transfer of Marine Technology," and it covers the basic provisions that encourage states to participate in technology exchange. The basic objective of this section of the Treaty is to accelerate the development of less developed countries and to generally improve the flow of marine technology throughout the world. It is intended to impact on all ocean-related technologies, and calls on all states parties to "promote actively the development and transfer of marine science and marine technology on fair and reasonable terms and conditions." Some of the basic objectives noted are the acquisition, evaluation, and dissemination of marine technological knowledge, the development of appropriate marine technology, and the training of individuals to work with the new technologies.

This is to be accomplished via conferences, seminars, symposia, the exchange of scientists, projects and joint ventures, and other general measures.⁷ The Authority is called upon to work with states and other entities to foster the transfer of technology. The Treaty also calls for the setting up of regional scientific centers which can act as "clearinghouses" for such information and further facilitate transfer of technology.⁸ Throughout this section, there is significant regard given to the rights of land-locked, geographically disadvantaged, and the least developed states.

As will be discussed later in this chapter, the industrial countries were amenable to the provisions of Part XIV, which did not mandate any technology transfer. While some critics of the Convention point to this section as demonstrating the developing country's disregard for patents and proprietary information, there seems to be little real problem with the section, which only encourages the transfer of technology.⁹

⁷ LOS, Part XIV, Section 1, pp. 131-132.

⁸ LOS, Part XIV, Section 2-3, pp. 132-135.

⁹ John Breaux, "Technology Transfer," Marine Technology Society Journal, Volume 13, July 1979, pp. 19-20.

Mandatory Transfer of Technology

In Part XI, "The Area," the issues become somewhat more controversial, to say the least. The heart of the matter is contained in Article 144, "Transfer of Technology." It is worth quoting here:

"Article 144

Transfer of Technology

1. The Authority shall take measures in accordance with this Convention:

(a) to acquire technology and scientific knowledge relating to activity in the Area; and

(b) to promote and encourage the transfer to developing States of such technology and scientific knowledge so that all States Parties benefit therefrom.

2. To this end the Authority and States Parties shall cooperate in promoting the transfer of technology and scientific knowledge relating to activities in the Area so that the Enterprise and all States Parties may benefit therefrom. In particular they shall initiate and promote:

(a) programmes for the transfer of technology to the Enterprise and to developing States with regard to activities in the Area, including inter alia, facilitating the access of the Enterprise and of developing States to the relevant technology, under fair and reasonable terms and conditions;

(b) measures directed towards the advancement of the technology of the Enterprise and the domestic technology of developing States, particularly by providing opportunities to personnel from the Enterprise and from developing States for training in marine science and technology and for their full participation in activities in the Area."

¹⁰LOS, Part XI, p. 64.

These provisions are not particularly stringent, although some critics of the Treaty have pointed to the fact that the text calls for due regard for "fair and reasonable terms and conditions" instead of "commercial terms" which some of the Western powers wanted substituted¹¹ in the text.

By far the most specific, controversial, and detailed code of conduct for the transfer of technology ever developed is contained in Annex III, Article 5 of the Treaty, entitled "Transfer of Technology." Again, while quite lengthy, it is impossible to facilitate a complete discussion of this issue without carefully reading the passages that have brought about such concern among the western countries and corporations:¹²

Article 5 of Annex III

"Transfer of Technology"

1. When submitting a proposed plan of work, every applicant shall make available to the Authority a general description of the equipment and methods to be used in carrying out activities in the Area, as well as other relevant non-proprietary information about the

¹¹Breaux, pp. 21-22.

¹²LOS, Annex III, Article 5, p. 165.

characteristics of such technology, and information as to where such technology is available.

2. Every operator under an approved plan of work shall inform the Authority of revisions in the description and information required by paragraph 1 whenever a substantial technological change or innovation is introduced.

3. Every contract for the conduct of activities in the Area entered into by the Authority shall contain the following undertakings by the operator:

(a) To make available to the Enterprise, if and when the Authority shall so request and on fair and reasonable commercial terms and conditions, the technology which he uses in carrying out activities in the Area under the contract and which he is legally entitled to transfer. This shall be done by means of license or other appropriate arrangements which the operator shall negotiate with the Enterprise and which shall be set forth in a special agreement supplementary to the contract. This commitment may be invoked only if the Enterprise finds that it is unable to obtain the same or equally efficient and useful technology on the open market and on fair and reasonable commercial terms and conditions;

(b) To acquire, if and when requested to do so by the Enterprise and whenever it is possible to do so without substantial cost to the contractor, a legally binding and enforceable right to transfer to the Enterprise in accordance with sub-paragraph (a) any technology he uses in carrying out activities in the Area under contract which he is not legally entitled to where there is a substantial corporate relationship and which is not generally available on the open market. In cases where there is a substantial corporate relationship between the operator and the owner of the technology, the closeness of this relationship and the degree of control or influence shall be relevant to the determination whether all feasible measures have been taken. In cases where the operator exercises effective control over the owner, failure to acquire the legal rights from the owner shall be considered relevant to the applicant's qualifications for any subsequent proposed plan of work.

(d) To facilitate the acquisition by the Enterprise under license or other appropriate arrangements and on fair and reasonable commercial terms and conditions any technology covered by subparagraph (b) should the Enterprise decide to negotiate directly with the owner of the technology and request such facilitations;

(e) To take the same measures as those prescribed in sub-paragraphs (a), (b), and (c), and (d) for the benefit of a developing State or group of developing States which has applied for a contract under Article 9 of this Annex, provided that these measures shall be limited to the exploitation of the part of the area proposed by the contractor which has been reserved pursuant to Article 8 of this Annex and provided that activities under the contract sought by the developing State or group of developing States would not involve transfer of technology to a third State or the nationals of a Third State. Obligations under this provision shall only apply with respect to any given contractor where technology has not been requested or transferred by him to the Enterprise.

4. Disputes concerning the undertakings required by paragraph 3, like other provisions of the contracts, shall be subject to compulsory dispute settlement in accordance with Part XI, and monetary penalties, suspension, or termination of contract as provided in Article 18 of this Annex. Disputes as to whether offers made by the contractor are within the range of fair and reasonable commercial terms and conditions may be submitted by either party to binding commercial arbitration in accordance with the UNCITRAL Arbitration Rules or other arbitration rules as may be prescribed in the rules, regulations and procedures of the Authority. In any case in which the finding is negative, the contractor shall be given 45 days to revise his offer to bring it within that range before the Authority makes any determinations with respect to violation of the contract and the imposition of penalties, as provided in Article 18 of this Annex.

5. In the event that the Enterprise is unable to obtain appropriate technology on fair and reasonable commercial terms and conditions to commence in a timely manner the

recovery and processing of minerals from the Area, either the Council or the Assembly may convene a group of States Parties composed of those which are engaged in activities in the Area, those which have sponsored entities which are engaged in activities in the area, and other States Parties having access to such technology. This group shall consult together and shall take effective measures to ensure that the technology is made available to the Enterprise on fair and reasonable commercial terms and conditions. Each such State Party shall take all feasible measures to this end within its own legal system.

6. In the case of joint ventures with the Enterprise, technology transfer will be in accordance with the terms of the joint venture agreement.

7. The undertakings required by paragraph 3 shall be included in each contract for the conduct of activities in the Area until 10 years after the Enterprise has begun commercial production of minerals from the resources of the Area and may be invoked during that period.

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

Clearly, the Annex provides some "teeth" to the entire concept of technology transfer, and represents the most dramatic, forceful attempt to enforce the exchange of technology ever undertaken. The genesis of these provisions, as well as the implications for the world order of their implementation, are the subject of the remainder

of this dissertation.

As a final addition to this section of textual material from the Treaty itself dealing with technology transfer, it seems appropriate to quote two final Articles of the Treaty. While not directly related to marine technology transfer per se, these two sections of the Treaty furnish the heart of the argument over technology transfer in the law of the sea context. They are Articles 136 and 137:¹³

Article 136

Common heritage of mankind

The Area and its resources are the common heritage of mankind.

Article 137

Legal status of the Area and its resources

1. No State shall claim or exercise sovereignty or sovereign rights over any part of the Area or its resources, nor shall any State or natural or juridical person appropriate any part thereof. No such claim or exercise of sovereignty or sovereign rights, nor such shall such appropriation be recognized.

2. All rights in the resources of the Area are vested in mankind as a whole, on whose behalf the Authority shall

¹³LOS, Article 136-137, p. 112.

act. These resources are not subject to alienation. The Minerals recovered from the Area, however, may only be alienated in accordance with this Part and the rules, regulations and procedures of the Authority.

3. No State or natural or juridical person shall claim, acquire, or exercise rights with respect to the minerals recovered from the Area except in accordance with this Part. Otherwise, no such claim, acquisition or exercise of such rights shall be recognized.

These two articles are at the very center of many of the arguments made by supporters of mandatory technology transfer and the overall seabed regime espoused by the Treaty. This will be discussed in depth later in this dissertation, but suffice it to say at this point that if the minerals of the seabed are the common heritage, the technology necessary to exploit them tends to be viewed in that same category, according to many proponents of mandatory technology transfer. The ramifications of this debate will be explored at length below, but it is obvious that it collides directly with a doctrine of "freedom of the high seas" that would allow open development of the seabed under the high seas, as espoused by the U.S. and other industrial powers. Such are the outlines of the great debate.

D. Technology Transfer, the NIEO, and the Code of Conduct

In this brief section dealing with some additional background to the issues involved in marine technology transfer and the Law of the Sea, our focus will be on the intertwined threads of technology transfer in its broader context, the New International Economic Order (NIEO), and the United Nations Conference on Trade and Development's (UNCTAD) proposed Code of Conduct on Technology Transfer. These, of course, are all part of the much larger issues of the North-South dialogue, the global antipathy to the lingering aftertaste of the colonial period, the development of the poor, less industrialized countries of the Third World, and the questions of economic interdependence and perceived imperialism that resound in much international debate. It is possible here only to treat these issues in the most cursory fashion. The function of this section of the dissertation is to provide

a brief overview of the interrelationship of many of these issues and their impact on the Law of the Sea in general and marine technology transfer in particular.

Technology Transfer and the NIEO

In the years since the Second World War, the membership in the United Nations and other international organizations has gradually shifted toward a preponderance of LDCs and former colonial countries. Of the 158 countries in the U.N., roughly 120 could be classified as developing countries. As a result of this shift in membership, newer ideological directions have emerged in various international organizations, including calls for non-alignment, redistribution of the world's wealth, a new international economic, social, information, and technical order, greater emphasis on non-military power and solutions, and so on.

During the past twenty years, the developing countries have gradually increased their political strength in the

U.N. and other fora, bolstered by the success of the OPEC countries and a growing awareness on the part of the industrial world of the importance of global interdependence.

Perhaps the most notable instrument of change proposed by the developing world was the New International Economic Order (NIEO). It was accompanied by the more specific Programme of Action on the Establishment of a New International Economic Order. Both were U.N. General Assembly Resolutions of May 1, 1974. The basic groundwork for the resolutions was passed during the Summit Conference of Non-Aligned Nations, held in Algiers in September, 1973.¹⁴ The success of the OPEC countries later that winter with their strategy of slowing oil exports led to growing militancy among developing countries and a greater perception on the part of the West of its own vulnerabilities in situations of complex interdependence. Many of the basic ideas of the NIEO influenced the development of the Law of the Sea Treaty significantly. The most important concepts in terms of this dissertation, of course, deal with technology transfer.

¹⁴United Nations Document, General Assembly Resolution 3201 (S-VI)/3202 (S-VI), "Declaration on the Establishment of a New International Economic Order;" covered well in Edwin P. Reubens, "An Overview of the NIEO," The Challenge of the NIEO (New York: St. Martin's Press, 1979).

Some of the salient points of the NIEO that were embodied in the LOS Treaty include:

"4. The new international economic order should be founded on full respect for the following principles:

(p) Giving to the developing countries access to the achievements of modern science and technology, and promoting the transfer of technology and the creation of indigenous technology for the benefit of the developing countries in forms and in accordance with procedures which are suited to their economies;"

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Additionally, from the Programme:

Transfer of Technology

"All efforts to be made to:

(a) Formulate an international code of conduct for the transfer of technology corresponding to needs and conditions prevalent in developing countries;

(b) Give access on improved terms to modern technology and to adapt that technology, as appropriate, to specific economic, social, and ecological conditions and varying stages of development in developing countries;

(c) Expand significantly the assistance from developed to developing countries in research and development programmes and in the creation of suitable indigenous technology;

(d) Adapt commercial practices governing transfer of technology to the requirements of the developing countries and to prevent abuse of the rights of sellers;

(e) Promote international co-operation in research and development in exploration and exploitation, conservation, and the legitimate utilization of natural resources and all sources of energy.

In taking the above measures, the special needs of the least developed and land-locked countries should be borne in mind."

¹⁵ United Nations Document, NIEO Resolution, Paragraph 4.

It is difficult to overstate the feeling among the LDC negotiators and diplomats concerning the importance of ensuring a flow of technology. It was their perception (and remains so today) that technology could function as a sort of "magic wand" that might enable them to quickly improve the standard of living in their countries, allow them to break from dependence on a world market system they saw as grossly unfair, and effectively undo some of the damage that they believed years of colonial exploitation had inflicted upon their economies. The call for technology transfer was at the very heart of the desire of the LDCs to assume a full and equitable partnership in the society of nations.¹⁶

The fundamental arguments that underly the technology transfer issues in the NIEO and the Charter were those noted above combined with a perception that technology is "part of the universal human heritage to which all¹⁷ countries have access." The industrialized countries who possess the technology argue that knowledge and technology are the result of specific incentive-driven investment and represent private property under their legal systems. This

¹⁶Herbert G. Grubel, "The Case Against the New International Economic Order," The Contemporary International Economy (New York: St. Martin's Press, 1979), p. 484.

¹⁷Ibid.

conflict was at the root of the controversy surrounding marine technology transfer in the Law of the Sea Treaty.

There is a clear influence in the Law of the Sea Treaty that resulted from the NIEO and the general developing country views on technology transfer. Much of the wording itself is similar, and the basic premise that knowledge is part of the heritage of mankind, along with the seabed, is also apparent throughout the text of the Treaty. The ability of the developing countries, (under their umbrella negotiating group, the G-77) to insert strong technology transfer provisions in the Treaty was also reinforced by the concurrent developments in the 1970s concerning the proposed Code of Conduct for Technology Transfer.

The Code of Conduct and the Paris Convention

Many observers point to two specific areas in which the LDCs have sought change in the general provisions of technology transfer in the 1970s. These are the Paris Convention, which governs international protection of

patents, trademarks, and other industrial property; and the desire to institute a new Code of Conduct for international technology transfer more favorable to the developing world.¹⁸ Each of these will be briefly examined below.

The Paris Convention for the Protection of Industrial Property (Paris Convention) was enacted in 1883 to provide an international protection system for patents, trademarks, and other forms of intellectual property. It also provides a means for international patent filing. The countries of the developing world have long maintained that the Paris Convention prevents them from obtaining needed technology and increases the cost of what they do receive. In this, they are essentially correct, although the holders of the technology argue that such rents should accrue to the developer of new and expensive technology--otherwise there would be little reason to invent, research, or develop new technologies. The developing countries would like to enact the following changes to the Paris Convention, according to one close observer of the conferences:¹⁹

¹⁸G.K. Helleiner, "International Technology Issues," The New International Economic Order (Cambridge: MIT Press, 1977), p. 299.

¹⁹William C. Brewer, Jr., "Technology Transfer," Ocean Policy Study 2:4 (Charlottesville: COLP, 1980), p. 5.

"1. Requiring developed countries to reduce fees for patent and trademark applications filed by developing country nationals;

2. Requiring developed states to grant longer priority periods for applications filed by developing country nationals;

3. Reviewing the length of the period during which a compulsory license may not be required;

4. Authorizing the funding of legal and technical assistance to developing countries for the improvement of their industrial property systems."

Unfortunately for the developing countries, the industrial countries currently believe that the Paris Convention provides the minimum necessary protection of intellectual property rights. Such organizations as the Licensing Executives Society, an internationally powerful group of lawyers and patent specialists, rejects the LDC call for revision of the Convention. It is important to note, however, the similarity between the technology transfer provisions of the Law of the Sea Treaty and the proposed revision of the Paris Convention. The proceedings

of the meetings on the revisions for the Paris Convention had a distinct effect on the concurrent LOS negotiations in the 1970s. While the subject of the revision of the Paris Convention has been widely discussed in various U.S. fora (including UNCTAD, UNIDO, and World Intellectual Property Owners (WIPO)), there has been little actual progress to date.

The UNCTAD Code of Conduct on Technology Transfer

The issue of the proposed Code of Conduct for Technology Transfer was heavily debated in the 1970s. The call for the Code was sounded in the NIEO and the Charter in the early 1970s, and practical efforts to undertake negotiation and implementation in the mid- and late- 1970s were made under the auspices of UNCTAD. The main points of the discussions, which echoed the NIEO and the Charter,²⁰ were as follows:

"1. What will be regarded as restrictive business practices?

2. Whether the Code of Conduct shall be legally

²⁰ G.K. Helleiner, pp. 299-300.

binding and backed by national laws, or merely offered in the form of voluntary guidelines?

3. Whether it (the Code of Conduct) should incorporate the principle of special preferences for LDCs?

4. Whether such legal problems as arise in technology contracts should be subject to international arbitration or to resolution by the courts of the host or home country?

5. Whether it should include a number of guarantees that supply firms are to offer to purchasers, such as completeness?

6. Whether it (the Code) should incorporate a number of general prohibitions and restrictions as to terms of technology transfer, such as limits on royalty payments to parent firms, time limits on licensing agreements, etc."

As mentioned above, the principle forum for the discussion of the efforts to write the Code was UNCTAD. Mr. Surenda Patel, Director of the Technology Division of UNCTAD and a leader in the Conference, said that "there was little doubt in his mind that in the 25 years to come, the Code, as the cornerstone of major technological reform, would lay the foundations for orderly trade in

technology."²¹ Mr. Patel also commented that the Code would eventually "introduce a new international technological order."²²

The Group of 77 was in many ways the chief motivator on the Code of Conduct negotiations, as well as the main player in the Paris Convention revision talks. Two other major groups in the Code of Conduct talks were the industrial nations (Group B) and the socialist nations (Group D). While all three of the major groups in the Code of Conduct talks agreed that basic patent rights must be protected and that more technology must be transferred to the LDCs, a basic philosophic disagreement has held the talks in limbo throughout the late 1970s and early 1980s. The developed nations want a laissez faire system, with a minimum of governmental interference. The Group of 77 on the other hand, desire greater governmental control in order to ensure effective technology transfer.

According to Adam Boczek, a political scientist, four²³ other vital areas of disagreement also held up progress:

1. Differences over the binding nature of the Code.
2. Distinctions between transfer of technology only

²¹U.N. Document, Conference on International Code of Conduct on Technology, 3rd Session, TD/COND/TOT/SR.14, 8 May 1980, p. 3.

²²Ibid., p. 4.

²³Adam Boleslaw Boczek, "Transfer of Technology," Paper, Convention of International Studies, March, 1981.

to subsidiaries and transfers to foreign source enterprises.

3. Banning of all "unfair" practices---the problem is determining what is "unfair."

4. Applicable law and the correct fora for dispute resolution.

Overall, the general climate for change in the international technology transfer system has been somewhat capricious at best, although some progress has been made. Efforts to change the Paris Convention and develop a Code of Conduct are ongoing, and some form of agreement will probably eventually be worked out, although the recent example of UNCLOS III has not boded well for the broader technology transfer talks.

One thing emerges clearly from the foregoing discussion of the international efforts on formalizing technology transfer: They did have a major effect on the drafts of the UNCLOS Treaty, which incorporates the basic ideals of technology transfer theory popular in the various international fora of the 1970s. This is particularly apparent in the mandatory technology transfer sections of

the Treaty, such as those described in Annex III, Article 5.

E. United Nations

One of the most important actor-groups in the Law of the Sea Treaty process was composed of the international organizations (IOs), personified by the United Nations. It is difficult to differentiate between the United Nations organization per se and the viewpoints of the various nations and groups that constitute its membership. Our focus in this section of the dissertation will be on the organization as a whole and its role in providing a forum and leadership in the area of marine technology transfer during the Treaty negotiation.

In order to fully explore the viewpoint and role of the United Nations, the discussion will cover the gradual progress of the issue during the various sessions of UNCLOS III. This will serve two purposes. First, it will complete the task of providing a full and coherent background on the issue of marine technology transfer in

the Law of the Sea context by giving the reader an idea of the sequence involved over the course of the Conference. Second, it will be possible to highlight the leadership and direction provided via the individuals at the U.N. itself, assessing their contributions to the negotiation of the technology transfer issues. In the process, the U.N.'s role should be fully illuminated. The conclusion of this section will include an overall analysis of the U.N.'s role and assessment of its potential for further impact on the Law of the Sea and marine technology transfer.

U.N Leadership Defined

It is important at this point to define what is meant in this section by "U.N. Leadership." For our purposes, the leadership consists of those individuals involved with the Law of the Sea Treaty who were elected or appointed to positions of leadership within the Conference. The effectiveness of such leaders is of course dependent on their ability to transcend their respective national interests and work for the agreement on its merits as a

global accord. The leadership also included those career bureaucrats who were directly concerned with Treaty matters during the period of the negotiations. It would also include those delegates who have worked for the settlement and held the interests of the Convention as a whole over their individual national interests. Obviously, it is difficult to differentiate among the vast mass of delegates and the few impartial actors in leadership roles, but such persons as Tommy T.B. Koh, Avrid Pardo, Hamilton Amerasinghe, Cornel Metternich, Bernardo Zuleta, Paul Engo, Alan Beesley, Elliot Richardson, among others, have demonstrated an even-handed, compromise -oriented approach throughout much of the negotiating. This is not to say that such leaders do not have a particular ideological agenda they are pursuing---most did. It does mean, however, that they provided leadership to the Conference as a whole and often managed to simply "keep the thing moving" as one astute negotiator described it.²⁴ These leaders, both from the Conference delegates and the U.N. staff, acted as a voice calling for negotiation and compromise throughout the long years of the Conference.

²⁴ Ambassador Alan Beesley, Interview, Kingston, RI, June, 1983.

The U.N. and Marine Technology Transfer

Preparations and First Session. When initial preparation for the UNCLOS III Conference was being undertaken, the issue of technology transfer was studied by the 91 member U.N. Seabed Committee, which produced a six volume report between 1970 and the commencement of the Conference proper in 1973.²⁵ The broad subjects of the Conference were delegated to three sub-committees, as follows:²⁶

- Sub-committee I: International regime and international organizations
- Sub-committee II: Territorial Seas, straits, high seas, fisheries, and other traditional issues.
- Sub-committee III: Pollution, scientific research, and technology transfer.

At this early point, there was not a sense of controversy involved with the technology transfer issue. As one observer has written, "Most delegates seemed (in the early days) to accept the fact that technology was in the

²⁵ Ambassador Elliot Richardson, Interview, Washington, DC, June, 1981.

²⁶ Bernard Oxman and John R. Stevenson, "Preparations for the LOS Conference," American Journal of International Law, Volume 68, 1974, pp. 1-2.

hands of the mining companies and that if the Authority itself wanted to conduct mining operations, it would have to do so through the medium of joint ventures or contractual arrangements.²⁷ In general, the Conference was mildly pro-transfer, and the leadership, including such figures as Amerasinghe, Pardo, and Zuleta, was much more concerned with the issues perceived at the time as the most controversial, notably the work of Sub-committee II. In fact, "The working group on scientific research and technology transfer was the last to begin work . . . "²⁸ Some commentators have expressed the opinion that the developing countries thought that the leverage of the Enterprise and the Authority over the mining companies on the issue of allocating sites would enable them to obtain whatever technology was required for mining.²⁹ The overall positive trend in favor of technology transfer was indicated by the work going on in various other organs of the United Nations, including the International Labor Organization, the UNCTAD Conference on a Code of Conduct for technology transfer, and the Conference to revise the Paris Convention.³⁰ It was assumed by some of the

²⁷ William C. Brewer, Interview, Kingston, RI, June, 1983.

²⁸ Oxman and Stevenson, p. 3.

²⁹ Jon Jacobson, Interview, June, 1983.

³⁰ Oxman and Stevenson, pp. 28-30.

developing country delegates (and some of the industrial ones as well) that technology transfer was a "going concern" and would naturally be absorbed as part of the Treaty without much difficulty.

Second Session. By the time of the Caracas Session in the summer of 1974 (this Second Session ran from June 20 to August 29), the Third Committee was firmly established,³¹ headed by Ambassador A. Yankov of Bulgaria as Chairman. The Chairman of the informal sessions on scientific research and transfer of technology was Cornel Metternich³² of the Federal Republic of Germany. The fact that technology transfer was grouped with the relatively non-controversial topic of "scientific research" indicates that the Conference still regarded it as a straightforward issue. In the First Committee, there was no discussion of technology transfer in conjunction with seabed mining. One observer has remarked that "It was apparently assumed by the developing countries, as before, that a unitary system would give the Authority ample bargaining power to obtain what it needed; while the industrial states assumed that the question would simply not arise under a system of State

³¹Bernard Oxman and John R. Stevenson, "The Third UNCLOS," AJIL, Volume 69, 1975, p. 1.

³²Ibid.

or private enterprises." ³³ In the Third Committee, a working group on technology was formed and held some 21 meetings. Some of the initial drafts of the provisions were submitted by delegations from Nigeria and Sri Lanka. Together with about 20 other countries, these two countries made a proposal calling for "transfer of technology, including the facilitation of transferring patented and non-patented technology through agreements under equitable ³⁴ and reasonable conditions." Their proposal further identified a need for "the Authority (to) ensure that legal arrangements with respect to sea-bed activities provide for the training of developing state nationals, and that all patents on machinery and processes for exploiting the international area be made available to developing states ³⁵ upon request." These first set of proposals were regarded as good mechanisms for development by the United Nations leadership, and were endorsed by the majority of ³⁶ states involved with the first rounds of drafting.

Third Session. By the time of the Third Session (Geneva, 26 March to 10 May, 1975), a series of informal texts were being issued, and the report of the Third

³³ William C. Brewer, p. 10.

³⁴ United Nations Document, A/CONF.62/C.3/L12, UNCLOS III, Official Records 253, 1974.

³⁵ Ibid, p. 29.

³⁶ Ibid, p. 30.

Committee which was submitted was substantially along the lines of the Nigerian/Sri Lankan proposals. Article I of the Single Negotiating Text (SNT), Part III, called for states to promote "the development and transfer of marine sciences and marine technology at fair and reasonable terms,³⁷ with reference to the special needs of the developing states. At several other points in the SNT³⁸ (Articles 3,6,9) states were called upon to:

1. Promote the acquisition, evolution, and dissemination of marine scientific and technological knowledge.

2. Promote training and education.

3. Facilitate access to scientific and technological information and data.

4. Promote the establishment of universally accepted guidelines for the transfer of marine technology.

In this Geneva Session, the issue of marine technology began to move from the exclusive province of the Third Committee to the relatively more politicized First Committee. Some portions of the SNT from the First

³⁷ Bernard Oxman and John Stevenson, "The Third UNCLOS, 1975 Session," AJIL, Vol. 69, 1975, p. 763.

³⁸ Ibid., p. 795.

Committee dealt with transfer of technology and the opportunity of the developing nations to gain access to that technology in association with ventures involving the deep seabed. Describing the machinations that accompanied the shift in the issue from the Third to the First Committee, Bernard Oxman and John Stevenson commented, "The extent to which developing country positions in Committee I are in fact motivated by the desire to use the international seabed Authority as a vehicle for increased participation and training in the development and use of advanced and highly sophisticated marine technology is unclear."³⁹ While it may have been unclear in 1976, when their comments were published, it has become increasingly clear over the years of UNCLOS III. Both the developing countries and the U.N. leadership began to see the Sea Law Treaty as a vehicle to assist in pressuring for a redistribution of technology. The concept of improving technology transfer provisions in favor of the developing countries seemed to be in vogue across the broad range of U.N. activities.⁴⁰ It was not so much the specific marine mining technology that was important in the eyes of the

³⁹ Ibid., p. 795.

⁴⁰ William C. Brewer, Interview, June, 1983.

U.N. leadership. Indeed, as Oxman points out, "It . . . (the technology) . . would not seem very relevant to the development needs and priorities of the less developed . . countries."⁴¹ The issue was clearly the precedential value of the mandatory transfer process, both ideologically and politically.

Fourth Session. The key issue that was emerging as early as 1975 was not in fact the actual transfer of the specific marine technology, important as that was; rather, the United Nations was anxious to set a solid precedent in a consensus forum that would in fact provide a firm foundation for future activities involving development and transfer of technology. This was becoming increasingly clear as the sessions strained to maintain some kind of consensus agreement on the subject, often at the expense of other questions. The general position at this point continued to be a standoff, although there was some movement from the opposing polar positions. The developing countries were looking for a "unitary" mining agreement, meaning that the Enterprise would be the only entity allowed to mine. The industrial countries thought that the

⁴¹Bernard Oxman and John Stevenson, "The 1975 Session," AJIL, Volume 69, 1975, p. 795.

best approach would be a purely private enterprise mining scheme, with the role of the Authority limited to that of a "frontier claims office." The Conference leadership, including the various committee chairmen, was able to move both sides toward the middle ground of a parallel system, although it was first formally proposed by the U.S.'s Henry Kissinger.

Fifth Session. The 1976 New York Session (Fifth Session) was dominated by the Revised Single Negotiating Text (RSNT) issued in the spring. The issue of deep seabed mining had emerged as the key question to be settled if consensus were to be achieved.⁴² Closely tied to the overall issue of seabed mining was the question of transferring the technology that would make the mining possible. "Both sides were agreed that the still-to-be-born Enterprise must find some way to acquire the technology that the private operators were beginning to accumulate."⁴³ The situation was essentially at a stalemate. At the encouragement of the Ambassador Amerasinghe, U.S. Secretary of State Henry Kissinger agreed in principle to the technology provisions of the RSNT in order to "sell" the

⁴²Bernard H. Oxman, "The Third UNCLOS: 1976 Session," AJIL, Vol. 71, 1977, p. 247.

⁴³William Brewer, p. 11.

idea of a parallel mining system (the issuing of simultaneous mining tracts by the Authority to the Enterprise and a private company).⁴⁴ The issue of technology transfer was incorporated in the compromises that categorized the New York Session, although the U.S. and other industrialized countries still had primary objections. The Kissinger proposal had not been specific on the issue of technology transfer, and the Secretary almost seemed to off-handedly "give it away" according to some observers.⁴⁵

Sixth Session. Despite internal opposition from Western industry and elements of the industrial governments, the technology issue seemed headed for compromise before the sixth session. The remaining problem at this point revolved around the concept of conditionality. This was spelled out by Ambassador Elliot Richardson immediately before the 1977 New York session⁴⁶ (the Sixth Session, 23 May to 15 July):

- "Among the serious points of substantive difficulty in the latest deep seabeds text, and the system it would define, are the following:

⁴⁴Ibid.

⁴⁵U.S. Government Document, "Evaluation of LOS Problems: A Talking Paper," Department of State, June, 1981.

⁴⁶Bernard Oxman, "The Third UNCLOS: 1977 Session," AJIL, Volume 72, 1978, p. 57.

It could be read to make technology transfer by contractors a condition of access to the deep seabed---subject, at least in part, to negotiation in the pursuit of a contract."⁴⁷

He also said:

"The technological and financial capabilities necessary for deep seabed mining are now in the hands of only a few entities. A system that would attempt to mandate the transfer of these capabilities would stifle investment altogether; and for that reason it would simply not work---nor indeed would it come into being."⁴⁸ The provisions to which the Western powers objected had been drafted amidst a cloud of confusion and entered the Informal Composite Negotiating Text (ICNT). These were softened at the behest of the U.N. leadership, who again played a mediating role in the process, under the direction of Conference President Hamilton Amerasinghe of Sri Lanka.

Seventh Session. During the Seventh Session, three negotiating groups were established to deal with outstanding "hard core" issues involved in deep seabed

⁴⁷ Ambassador Elliot Richardson, Statement issued by the Department of State, 20 July 1977.

⁴⁸ Ambassador Elliot Richardson, Statement issued by the Department of State, 10 March 1977.

mining, i.e. Part XI, the Area. Negotiating Group I was charged with the provisions on technology transfer. The conditionality question was resolved by removing the precondition of agreement to transfer technology before⁴⁹ awarding a contract. Instead of actually transferring the technology before getting the contract, the miner agreed to make the transfer, on fair and reasonable grounds, of technology he is entitled to transfer. He (the Miner) must obtain from the owner of any technology he is using but does not own, permission to transfer it to the Enterprise. Arbitration was provided for in the ICNT, as were provisions for penalties if the miner failed to respect the conditions of the contract. A further objection was raised by the developed countries that there was no time limit on the obligation to transfer technology, and that the technology would be available to developing countries⁵⁰ through the Authority (the Brazil Clause). There was a growing feeling among the leadership that there would be a need to adopt a more compromising approach to issues of technology transfer, particularly if the treaty was to achieve consensus. This was reflected in later

⁴⁹Bernard Oxman, "The Third UNCLOS: Seventh Session," AJIL, Volume 73, 1979, p. 1.

⁵⁰Ibid., p. 10.

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developments. By the end of the Seventh Session, the issue of technology transfer had made a complete transition to the agenda of the First Committee. It had been agreed that the operative agreements on technology transfer would be contained in Part XI, the Area, instead of Part XIV, Development and Transfer of Marine Technology. Whatever the outcome in the discussion associated with the mining itself, the results would be incorporated throughout the document.⁵² The final wording of the technology transfer provisions were the result of work done by Frank Njenga of Ghana, Chairman of Negotiating Group One, a subset of the First Committee.

Eighth Session. The Eighth Session was held in Geneva (19 March-27 April) and New York (16 July-24 August

1979).⁵³ The Conference felt that most of the key controversies in the technology transfer provisions were settled. The broad statements of technology transfer from the Third Committee were "considered complete" by the

chairman.⁵⁴ They were presented as Part XIV (Development and Transfer of Marine Technology) to the ICNT/Revision

1.⁵⁵ Although the Brazil Clause (forcing transfer to

⁵¹Ibid., pp. 1-31.

⁵²Ibid., p. 7.

⁵³Bernard Oxman, "The Third UNCLOS: Eighth Session," AJIL, Volume 74, 1980, p. 1.

⁵⁴Ibid., pp. 3-7.

⁵⁵Ibid., pp. 3-4.

developing countries from the Authority) was still incorporated in the text (Annex II, Article) the developed countries seemed willing to accept the technology transfer clauses as a basic precedent for further development projects. As one observer has mentioned, " . . . it seemed possible that we (the industrial countries) would be able to shape the clauses more to our benefit during the period of initial practice."⁵⁶ The U.S. still continued to voice strong opposition to the clauses in the text, notably to the " . . . Brazil clause, time limits, dispute settlements, and avoidance of warranty implications."⁵⁷ Another expert has also commented that "in the minds of the developed countries the first "improvement" was to get rid of the so-called Brazil Clause, which, in their view, had no place among the mandatory obligations which they were accepting for the sole purpose of getting the Enterprise started in business."⁵⁸ The Group of 77, on the other hand, wanted a specific reference to the processing technology needed to extract the metals from the seabed nodules. The Session ended with the offending clauses still intact, and a new reference to the processing

⁵⁶Elizabeth G. Wylie, Delegate, Interview, Washington, June, 1981.

⁵⁷Bernard Oxman, AJIL, Volume 74, 1980, p. 7.

⁵⁸William C. Brewer, p. 16.

technology inserted in the ICNT's current draft.

Ninth Session. During the Ninth Session in 1980 (New York, 27 February-4 April and Geneva 28 July - 29 August), the opposition to the technology transfer provisions from the developed countries was again becoming more pronounced. Amerasinghe, Koh, and others continued to press for the amendments as a matter of setting precedent. They also saw the mandated technology transfer as a means to combat monopoly control over the technology by both companies and countries. They "sought to ensure that the Enterprise would receive the necessary capital and technology to function independently or to bargain from strength in making joint arrangements."⁵⁹ The U.S. objections (with substantial support from other industrialized countries) included:

1. The Brazil Clause
2. Time Limits
3. Dispute Settlement recourse for Third Party Owners
4. Avoidance of warranty implications

During the Ninth Session, these were reorganized and redrafted as follows:

⁵⁹Bernard Oxman, "The Third UNCLOS: Ninth Session," AJIL, Volume 75, 1981, p. 211.

- An objectionable (from the viewpoint of the developed nations) clause was eliminated, which had allowed the "blacklisting of a third party owner who would not fulfill his promise to pass technology to the Enterprise.

- A time limit of 10 years was set on the obligation of the miner to transfer technology he used in his mining to the Enterprise.

- The developing nations gave up their efforts to obtain processing technology, which had not been a part of the agreement. This was a quid pro quo urged by committee chairmen to reflect the long 10 year time limit.

- The overall obligation of the miner to obtain the third party technology was reduced to "whenever it is possible to do so without substantial cost to" the miner.⁶⁰ While there were still objections by certain countries on both sides, the Conference leadership had managed to bring things to a position of relative stability in the technology transfer issue, at least from the viewpoint of the majority of delegates.

Tenth Session. The Tenth Session of UNCLOS III was the first attended by the new delegation from the U.S.

⁶⁰ Max Morris, Delegate, Interview, Jacksonville, FL, December, 1982.

composed of appointees from the Reagan administration. It met in New York (9 March - 24 April) and Geneva (3 August-⁶¹ 28 August) in 1981.

It was also notable from the point of view of United Nations leadership, since Ambassador Hamilton Shirly Amerasinghe of Sri Lanka, the President of the Conference from its beginning, died.⁶² He was replaced by Ambassador Tommy T.B. Koh of Singapore on March 13, 1981.⁶³ The United States presented the Conference leadership with its sharpest challenge to date in a statement issued on 2 March 1981, in which it (the U.S.) announced its intention to essentially withdraw from the UNCLOS to conduct a total policy review. It was clear to the United Nations leadership (Koh and the Committee chairmen) that the entire Sea Law Treaty might be in jeopardy, and the progress of the U.S. review soon showed problems in the technology transfer sections of the draft:⁶⁴

" . . . through its transfer of technology provisions, the Draft Convention compells the sale of proprietary information and technology now largely in U.S. hands. Under the Draft Convention, with certain restrictions, the

⁶¹Bernard Oxman, "The Third UNCLOS: Tenth Session," AJIL, Volume 76, 1982, p. 1.

⁶²*Ibid.*, p. 2.

⁶³*Ibid.*, pp. 2-3.

⁶⁴*Ibid.*, p. 9.

Enterprise, through mandatory transfer, is guaranteed access on request to the seabed mining technology owned by private companies and also technology used by them but owned by others. The text further guarantees similar access to privately-owned technology by any developing country planning to go into seabed mining. We must also carefully consider how such provisions relate to security-related technology."

The Brazil Clause particularly continued to be attacked by the U.S. as we have noted in earlier sections of this dissertation. The reaction of the Conference leadership (including such moderates as Ambassadors Koh and Beesley) was defensive and angry. The common perception was that the U.S. was trying to turn back the clock to 1974, a commonly repeated expression among the U.N. delegations.⁶⁵ It was thought that the U.S. had certainly been afforded plenty of time to review the draft Treaty over the years of its negotiation particularly given the great length of time over which the discussion had stretched by 1981. As explained earlier, the Group of 77 and other developing nations were outraged by the U.S. action. The

⁶⁵ Bernardo Zuleta, U.N. Legal Office, Interview, Boston/New York via Telephone, August, 1981.

more moderate United Nations leadership, on the other hand, while expressing disapproval, tried to find some ground for soothing statements. It was clear that they wanted the U.S. as a full participant in the Treaty, both for the principle of consensus and also because of the legal doubt that would accompany any maritime agreement without the approval of the U.S.. President Koh, trying to gently prod the U.S., commented that the Convention "would be adopted, preferably with, but if necessary, without the United States."⁶⁶

In the Tenth Session, an interesting tension began to make itself felt. Several of the various agencies associated with the United Nations development programs began to voice skepticism concerning the transfer of marine⁶⁷ technology in the Law of the Sea context. The general feeling was that very few actual benefits would accrue to the developing countries as a result of the activities of the Enterprise. The fear was that more and more of the limited United Nations funds might be channeled into the Law of the Sea organs, such as the Enterprise, which would be expressed as a commensurate reduction in the budgets of

⁶⁶ Bernard Oxman, AJIL, Volume 76, 1982, p. 21.

⁶⁷ Ibid., p. 21.

the other development agencies. The Law of the Sea vehicle was perceived as glamorous and publicity-oriented, at the expense of the day-to-day, hardworking, smaller agencies concerned with development. This feeling was further exacerbated by the fear that if the U.S. or other larger countries were not satisfied with the Treaty, they would reduce their financial commitment to the United Nations as a whole, or utilize "selective funding" to cut participation in the development side of the organization, despite the illegality of this. Such measures are still advocated by some conservative U.S. journalists and writers.⁶⁸

Eleventh Session. The final session of UNCLOS III saw attempts at conciliation by the United Nations leadership, followed by bitterness at the U.S. demand for a vote and ultimate rejection of the Treaty. The session was held in New York, and ran from 3 March - 30 April, 1982, concluding with a vote on the entire draft Convention. Prior to the final session, the mood among U.N. leadership (especially moderates like Koh, Beesley, Ambassador Pinto of Portugal, Ambassador Watson of Australia, and others) was fairly

⁶⁸For example, William Safire, "Come to Club Seabed," New York Times, November 8, 1982, p. A17.

upbeat, since the United States had announced that it would rejoin the negotiations following the administration's review of the Sea Law package. President Tommy Koh said, "The leadership of the Conference feels reasonably confident that we will be able to conclude the work of the Conference with the adoption of a Treaty in April."⁶⁹ He further commented that the United Nations was pleased with the U.S. decision to come back to the talks. Koh concluded, "The leadership of the Conference will try to create a good negotiating atmosphere for the negotiation of outstanding issues, including the proposals of the United States delegation."⁷⁰ His comments were echoed by Secretary General Javier Perez de Cuellar, who welcomed the decision by the U.S. to rejoin the negotiations and the U.S. position that most of the previous drafts would be acceptable.⁷¹ The Secretary-General concluded with the hope that the United States would come to the Conference's Eleventh Session in a constructive, flexible spirit which would take into account the many years of negotiations and the overwhelming desire of participants to conclude the Convention in 1982."⁷²

⁶⁹ "Leadership Sees Completion of Law of Sea Treaty," Diplomatic World Bulletin, Vol. 12, No. 4, March 8, 1982.

⁷⁰ Ibid., p. 1.

⁷¹ Ibid., pp. 1-2.

⁷² Ibid., p. 2.

Immediately after the session opened, an acrimonious debate began between the U.S. and the other industrial countries on the one hand and the Group of 77/developing countries on the other. The U.N. leadership tried during the session to perform a mediating role as the industrial countries threatened a mini-treaty and the Group of 77 countered with threats of law suits (in the International Court of Justice) and insisted they would conclude their own agreement with or without the industrial countries.⁷³ Some of the key leaders in these efforts included Ambassadors Koh, Beesley, Watson, and Richardson (in an ex officio role). In response to the first indication that the U.S., France, Britain, and West Germany had drafted a "mini-treaty," President Koh urged the four nations to delay their plan because it "threatens to jeopardize the good atmosphere for negotiations."⁷⁴ The Secretary-General also appealed to the major industrial countries to forbear signing a separate accord. "A just and equitable international order demands sacrifices and concessions from everyone, but particularly those who are best placed to derive immediate benefits from new uses of the sea."⁷⁵

⁷³Bernard Nossiter, "Third World Pact on Sea is Planned," New York Times, March 9, 1982, p. 17.

⁷⁴Ibid.

⁷⁵Ibid.

Javier Perez de Cuellar also met with Ambassador Malone to press the United Nation's position more firmly with the leading industrial country. The amendments, proposals, and counter-proposals that marked the Eleventh Session will be described in depth later in this Chapter. One of the major stumbling blocks continued to be the mandatory technology transfer issues of the mining portions of the Treaty.⁷⁶

As a last resort, the Conference President appealed to the U.S. to join the consensus despite concessions that he acknowledged fell short of demands. "It is the desire of every delegation in this conference to have a convention which will be supported by all states, including the United States," he said. "The conference is willing to pay a price in order to obtain the support of the U.S.. That price is not, however, an unlimited one. It must be a price which does not hurt the interest of other countries, especially the developing countries."⁷⁷ President Koh further proposed a specific suggestion to break the deadlock on the technology transfer issue. He suggested that if "a private concern balked at selling its technical knowledge, its government should fill the gap."⁷⁸ In

⁷⁶ Homer Blair, Interview, Lexington, MA, May, 1982.

⁷⁷ Bernard Nossiter, "U.N. May Vote Sea Law Today Without U.S.," New York Times, 30 April 1982, p. 1.

⁷⁸ Ibid., p. A4.

effect, he was trying to pass the responsibility for technology transfer from the private companies to the national governments. This was unacceptable to the U.S. on ideological grounds. The Reagan Administration, supported by some journalists and writers, insisted on a pure market solution to the problems of technology transfer, and the issue remained one of the key stumbling blocks in U.S.

participation in the convention.⁷⁹ The final vote was taken at the insistence of the U.S., and even such moderate figures in the leadership as Ambassador Koh were bitter and angry at the U.S.'s rejection of compromise.⁸⁰ "There can be no more negotiations," said President Koh. He went on to threaten suit in World Court if the U.S. continued to try and form a separate sea law pact. "If the court's opinion is that such activities under the 'mini-treaty' are illegal, I would like to see whether these Western countries, which have been sermonizing the Third World about the rule of law, will ask their (deep mining) consortia to stop such activities or whether they will reveal themselves to be a bunch of greedy hypocrites,"⁸¹ he said.

⁷⁹ Bernard Nossiter, "U.N. Adopts Sea Law; U.S. Votes No," New York Times, 1 May 1980, p. 3.

⁸⁰ "U.S. Studying Sea Law Treaty Options," Boston Globe, 2 May 1982, p. 11.

⁸¹ Ibid.

While still holding out some faint hope that the United States might eventually sign and ratify the Convention, many leaders still associated with the ongoing work of the Convention (such as Ambassador Koh, Bernardo Zuleta of the U.N., Paul Engo, Chairman of the Preparatory Commission, and others) seem convinced that it will be possible to have a workable Convention without the support of the United States. Whether the U.S. will ever accept the technology transfer provisions and other problems with the current draft and "sign on" remains to be seen. The role of the United Nations leadership in the immediate future will consist of trying to establish effective international law regarding marine technology transfer and the other sections of the Treaty. They will undertake this by encouraging as many countries as possible to ratify the Treaty (As of March, 1984, 121 have signed and 9 have ratified, 60 ratifications being needed to bring the Treaty into force). Insofar as the technology transfer provisions are concerned, the leadership will work to establish precedents with the industrial countries who did sign the Treaty, such as France and Japan. The U.N. will also

continue to utilize its other fora (UNCTAD, ILO, UNIDO,⁸² etc.) to press the issue of technology transfer home.

Conclusion

The United Nations organization, as embodied in the Conference actors and professional staffers, maintained itself as a fairly impartial organization through the technology transfer discussions in the Law of the Sea talks. The leadership, including the Conference Presidents, the committee chairmen, professional staffers, and bureaucrats, did a good job of trying to stay above the conflict between the key players in the controversies, and generally contented itself with trying to provide a fora, a constructive schedule, and a meaningful agenda for the talks. Although most of the leadership of the organization⁸³ came from Third World countries, most of them were able to fulfill a neutral role in dealing with contending power blocks. Naturally, there was some general sympathy toward the developing world side, although this was not surprising, given the preponderance of numbers of developing nations in

⁸²U.N. Document, UNCTAD Draft Code of Conduct on Technology Transfer, TD/COND TOT 25, 6 May 1980, p. 1.

⁸³The Chairmen were from LDCs over 70% of the time.

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the United Nations. The basic U.N. Charter and other General Assembly Resolutions through the 1970s were the basis for the leadership action, and they fulfilled their designated charter in a relatively even-handed, conciliatory fashion.⁸⁵ Clearly, the U.N. leadership acted in reflection of the principles of the organization as they perceived them.

Overall, the Conference and U.N. leadership attempted to use the Sea Law Treaty as a means to establish a series of precedents involving the economic relations between states, particularly in the area of technology transfer. This is not, of course, the sole reason for the Treaty, but the linkages between the Law of the Sea and other U.N. fora and objectives cannot be ignored. This was a justifiable action based on the membership, the stated goals of the organization, and the presumed politics of the U.N.. By pursuing such precedents and linkages, the leadership still maintained a fairly even-handed approach, but was ultimately forced to take sides between the industrial states and the developing states as the Treaty negotiation reached a climax. Given the above considerations, as well

⁸⁴Tom Alexander, "Reaganites Misadventures at Sea," Fortune, August 22, 1982, p. 134.

⁸⁵U.N. Charter: "employ international machinery for the promotion . . . of all peoples."

as the length of time and effort invested in the Sea Law Treaty up to 1982, it is not suprising that the U.N. and Conference leadership ultimately lent their support and prestige to the developing countries in their final attmpt to pass the Treaty with full consensus approval in the Eleventh and final session.

F. Corporations

The influence of many corporations and their lobbying groups was a key consideration in the outcome of the Law of the Sea discussions on marine technology transfer. Much of the world's significant, readily available technology is held by private, Western corporations. As the Treaty stands today, the corporations will be required to transfer technology to various U.N. bodies involved in the Law of the Sea administration. The technology thus transferred will be available via the Authority and the Enterprise to the developing countries. The U.N. organs are tasked with ensuring that the technology thus obtained is used in such a way as to benefit mankind as a whole.⁸⁶ The technology is not to be transferred unless the Enterprise and Authority are unable to obtain the equipment on the open market, and a fair and reasonable price must be given for the technology.

⁸⁶LOS, Article 144, p. 64.

In this section, the focus will be on the opinions and objectives of various private corporations and their lobbying groups in regard to the technology transfer provisions of the Law of the Sea Treaty. The attitudes of many United States firms, as represented by the Chamber of Commerce, the National Association of Manufacturers (NAM), the National Ocean Industry Association (NOIA), the Licensing Executives Society (LES), and the opinions of various corporate executives will be examined. Some attention will be given to foreign firms involved in deep seabed mining, although access to such information is limited. The views of several experts on technology transfer associated with business concerns in the U.S. and members of the U.S. Law of the Sea delegation will also be discussed. The focus in this section will be on presenting the views of the various business concerns, with analysis and comment to follow in the final chapter of the dissertation.

U.S. Chamber of Commerce and Marine Technology Transfer

One of the major organizations representing American business interests as a whole is the Chamber of Commerce of the United States of America. The Chamber's membership consists of over 187,000 firms and individuals, over 2,600 local and state Chambers of Commerce, and some 1,200 trade and professional associations.⁸⁷ According to Mr. Hilton Davis, Vice President of the national Chamber of Commerce (Legislative and Political Affairs), "The particular issue of the Law of the Sea . . . Treaty and its various ramifications for business has been followed by several Chamber committees and task forces."⁸⁸ The Chamber, representing a very wide slice of U.S. businesses and corporations, has very serious reservations about provisions in three major areas dealing with technology transfer in the Law of the Sea context:⁸⁹

1. The extent of technology transfer powers vested in the U.N. seabed mining institutions (the Enterprise and the Authority).

2. The broad language used in the Treaty provisions

⁸⁷Hilton Davis, Vice President, Chamber of Commerce of the U.S., Letter, 26 October 1981, p. 1.

⁸⁸Ibid., p. 2.

⁸⁹Position Paper on Technology Transfer, Chamber of Commerce of the U.S., August, 1981, pp. 1-89.

in defining "technology".

3. The lack of protection for the integrity of private property.

The most revealing document insofar as the attitudes of U.S. business is concerned is the basic Chamber of Commerce position paper of 5 August 1981, produced by the Chamber's Technology Transfer Task Force. It spells out clearly the position of the Chamber, speaking for many of the businesses in the U.S. that control private marine technology. "Privately owned technology in this country (U.S.) is not the "common heritage of mankind."⁹⁰ The position paper points out that privately owned technology has been developed in the U.S. due in large measure to the "American economic system," which, according to the paper, "encourages and protects the development of technology." The paper comments that lack of full protection, i.e. technology transfer as outlined in the Law of the Sea Treaty, will only act as a major obstacle to the development and utilization of important mineral and hydrocarbon recovery technology. This, according to the Chamber, will ultimately be detrimental to the companies,

⁹⁰Position Paper on Technology Transfer, p. 1.

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LDCs, and industrial nations alike.

The basic attitude of the Chamber is that technology transfer must be voluntary, as well as profitable, for both the transferor and transferee. In accordance with this basic stand, the Chamber particularly opposes the strong provisions for broad technology transfer contained in Annex III, Article 5, Section 3, which, as pointed out earlier in this dissertation, guarantees marine technology to the Enterprise "on fair and reasonable commercial terms." The technology to which the Enterprise is entitled is the high technology that a private corporation might use in deep seabed mining. The provisions in effect turns over the technology to a major competitor. This disturbs the Chamber of Commerce.

The Chamber acknowledges the provision for transfer of the technology under "fair and reasonable commercial terms and conditions." The problem with this, the position paper points out, is that only an open market can assign a fair and reasonable value to the technology.

Another aspect of the Treaty that the Chamber has problems with is Article 162, which assigns membership on

⁹¹Ibid., p. 2.

the Board of the Authority, the guiding body for the Law of the Sea administration. The Chamber points out that the Council will be loaded in favor of "socialist and Third World interests."⁹² This is due to the mandatory geographical distribution scheme for the Council.

According to the Chamber, the definition of technology provided by Annex III, Section 8, is too broad. The Chamber comments, "This language includes within its scope information which is normally treated as proprietary and highly confidential."⁹³ The language is also objectionable to the Chamber in that it seeks to expropriate technology not even wholly owned by the user, but which is only licensed to the user.⁹⁴ After the technology has been passed to the Authority/Enterprise operation, the Chamber further objects to the fact that developing nations will be able to obtain the technology, as discussed in Section 3(e)⁹⁵ of Annex III.

The position paper goes on to quote George W. Whitney, President of the American Patent Law Association, who commented before the Committee on Foreign Relations, United States Senate:⁹⁶

⁹²Position Paper on Technology Transfer, p. 3.

⁹³Ibid., p. 4.

⁹⁴Ibid.

⁹⁵Ibid., p. 5.

⁹⁶George Whitney, President of the American Patent Law Association, Letter, 5 March 1981.

"High technology products, machines, and processes are assets acquired at high costs and considerable risks. Their development requires long term expenditures of money and manpower. To efficiently mine the sea, not only will existing technology and experience have to be greatly advanced, but whole new technologies will have to be developed. We cannot conceive that any American Industry will undertake this major endeavor, knowing that what it invents and brings into being will immediately be transferred to its competitors. We, as their advisors, could not in good faith recommend such action."

This seems to be tied in with an additional objection of the Chamber, that the U.S. would be providing funding for the U.N. Law of the Sea administration. This will lead, according to the position paper, to the use of "the financial resources of the United States . . . to ensure that privately owned technology is made available to others---including those who may be in direct competition with us."⁹⁷

In summary, the Chamber's objections seem to lie in what they perceive as direct violations of basic American

⁹⁷Position Paper on Technology Transfer, p. 8.

economic principles such as ownership of private property and the free enterprise system. The business community in the United States, insofar as it speaks through the Chamber (which does represent 187,000 paying enterprises), seems to be opposed to the transfer of marine technology, at least as outlined in the mandatory sections of the Law of the Sea Treaty.⁹⁸ On behalf of its members, the Chamber is carrying on an active and ongoing campaign against the technology transfer provisions of the Law of the Sea Treaty. The Chamber's basic position is that the U.S. should not sign the Treaty without some changes in the technology transfer provisions, and their influence is far-reaching and deeply felt in the executive and legislative branches of the U.S. government.⁹⁹

Licensing Executives Society

Behind every American business is a lawyer. Particularly in today's environment, every firm seemingly has a patent lawyer on the payroll, at least if it intends to compete in some segment of the highly specialized and

⁹⁸Hilton Davis, Letter, 20 October 1981.

⁹⁹Position Paper on Technology Transfer, pp. 1-8.

competitive technology market, either as a vendor, user, supplier, or producer. The national organization that brings together individuals whose "occupations involve a significant responsibility for technology transfer or licensing is the Licensing Executives Society, which has both an international branch and a U.S. branch, known as¹⁰⁰ L.E.S.-U.S.A." The Licensing Executives Society U.S.A. currently has well over 1,200 members throughout the U.S. and Canada, with more than half of its members employed by private corporations, with the remainder including lawyers in private practice, license consultants, license brokers,¹⁰¹ academics, and so on. They publish a journal, Les Nouvelles (New Things), sponsor international meetings relating to technology transfer, work with the U.N. and major governments in a consulting role, and publish a number of books relating to technology transfer.

One of the leaders in L.E.S.-U.S.A. is Homer Blair, Vice President in charge of patents for ITEK Corporation, located in Lexington, Massachusetts. In the December, 1977 issue of Les Nouvelles, he published a broad proposal to "Encourage Technology Transfer to Developing Nations," many

¹⁰⁰ Homer Blair, Interview, Lexington, MA, April, 1982.

¹⁰¹ Homer Blair, "Understanding Technology Transfer," (Lexington, MA: private Printing, 1981), p. 14.

aspects of which apply directly to the Law of the Sea discussions. Mr. Blair, an officer of L.E.S.-U.S.A., has also served for the U.S. government as an advisor to the U.S. delegation to the Law of the Sea. His expertise for the Law of the Sea delegation, obviously, was in the area¹⁰² of marine technology transfer. His proposal represents much of the thought from patent/technology transfer advisors to major U.S. multi-national (and some foreign) corporations.

Mr. Blair's proposal takes a fundamental stance that seems to rule out the efforts of the Law of the Sea delegation in transferring marine technology. It states, "Treaties, legislation, etc., will not result in the actual transfer of technology. The only way technology can be successfully transferred to the developing nations is to provide a system of sufficient incentives to private industry to make it want to transfer the technology to the developing nations."¹⁰³ The LES proposals are fairly broad, but come more or less directly from the basic¹⁰⁴ propositions stated above. The key points include:

¹⁰²Homer Blair, Interview, Lexington, MA, March, 1982.

¹⁰³Homer Blair, "LES-USA Proposals," Les Nouvelles, XII, December, 1977, No. 4, pp. 11-15.

¹⁰⁴Ibid., pp. 12-13.

LES PROPOSALS

The United States and the United Nations Should:

1. Recommend to developing nations they require their organizations to hire expert licensing consultants to represent them in finding the appropriate technology until such time as the organizations have their own experts.
2. Establish educational technology transfer fellowships programs to train technology transfer experts for developing nations.
3. Establish programs to educate engineers, accountants, and marketing people for developing nations, and where these programs are presently taking place, significantly increase them.
4. Implement, and where already initiated, increase substantially, the training of farmers from developing nations and make methods of increasing food production available to them in formats which they can readily apply. As agriculture is often within the province and expertise of government agencies, this is something specific which governmental agencies can do.

5. Provide incentives for local businesses within developing nations who want to acquire technology from others and to assist them in capitalizing on such technology transfer.
6. Provide an opportunity for officials of developing countries to study techniques used to attract industrial investment by other national, territorial, and state governments.
7. Establish the specific technology transfer incentive program, which will provide the necessary incentives to private industry to transfer technology to the developing nations.

The remainder of the proposal goes on to develop in some depth the basic seven points outlined above. Of particular interest are the details of item seven above, which is entitled, "A Specific Technology Transfer
¹⁰⁵Incentive Program." Mr. Blair outlines nine further points which he (and presumably L.E.S.-U.S.A.) feels would provide incentives that would bring about the voluntary
¹⁰⁶transfer of technology the patent advisors advocate:

1. Reduce direct aid, which is basically inefficient

¹⁰⁵Homer Blair, Les Nouvelles, p. 13.

¹⁰⁶Ibid.

2. Provide Incentive payments to owners of technology
3. Pay training costs of developing nation's people
4. Develop Cost sharing arrangements to build plants in developing nations
5. Ensure Royalty payments to technology owner
6. Maintain follow on technology transfer for ten years
7. Train developing nation people to be able to supervise and manage the plant
8. Royalty-free nonexclusive license under improvements granted to technology owner
9. Developing nation plant cannot export to country of technology owner for ten years

The basic plan here is that instead of the direct aid programs of earlier years, the L.E.S.-U.S.A. perceives that the developed countries or world organizations could underwrite the cost of the technology transfer to the LDCs. They do feel that some part of the cost of the technology should be carried by the LDC, to "require them to be selective and thus attempt to have the most appropriate technology transferred."¹⁰⁷ The proposal concludes by

¹⁰⁷ Homer Blair, Les Nouvelles, p. 14.

pointing out some of the benefits that will accrue to the world as a whole if a good program of technology transfer is implemented along the lines of the L.E.S. proposals. The final words of the proposal sum it up: "Expressions of good will, plans, and treaties will not do the job without¹⁰⁸ the right incentives."

In a revealing letter, written by William Marshall Lee, President of the L.E.S., to Richard Legatski of the National Ocean Industries Association, the position is stated very simply:

" . . . we believe that technology transfer should not be compulsory but instead be handled on a proper business basis under terms that are equitable to both the purchaser and those who have invested in development of the¹⁰⁹ technology."

Mr. Lee goes on in the letter to discuss the precedential effects of the Law of the Sea technology transfer provisions, calling them "very bad" and indicating concern that they could "adversely affect other international¹¹⁰ negotiations now in progress."

Overall, it is clear that the Licensing Executives

¹⁰⁸ Ibid., pp. 13-15.

¹⁰⁹ Mr. William Marshall Lee, President of LES, Letter, 20 July 1982, p. 1.

¹¹⁰ Ibid., p. 2.

Society, representative of many of the patent lawyers and licensing advisers in American corporate society, echoes many of the same misgivings that the Chamber of Commerce of the U.S. has about the marine technology transfer provisions of the Law of the Sea Treaty. They seem to represent the same slice of interest groups, and use roughly similar arguments in opposing the technology transfer provisions as written.

National Association of Manufacturers

The National Association of Manufacturers is a voluntary membership organization with more than 13,000 businesses focused on industrial activity. The membership includes firms involved in research, development, manufacture, and the marketing of new products and processes. According to David C. Frankil, an analyst of the Association, the firms in the NAM represent more than 80 percent of the products manufactured in the U.S. economy, and employ more than 85 percent of the manufacturing workforce. The lobbying association is

further associated with more than 158,000 businesses through a joint representation agreement with the National Industrial Council.¹¹¹ Mr. Frankil described the broad based industry opposition to the technology transfer provisions of the Treaty, refuting the charge that industrial opposition comes from "a small handful of mining firms."¹¹²

Mr. Frankil went on to categorize the objections to the technology transfer provisions that the NAM and its member-affiliates harbor:¹¹³

1. The definition of technology contained in the Treaty is "overly broad," and encompasses proprietary information and data that would not normally be available even under a commercial sale.

2. The transfer described in the mining sections of the Treaty would place a series of unacceptable obligations on the miner, notably the necessity of passing on "third party" technology. According to the NAM, this would result in many "licensed" technologies simply being withdrawn from the seabed mining industry, because the owners would not allow their passage to the Enterprise and developing

¹¹¹David Frankil, Analyst, National Association of Manufacturers, Interviews, Kingston and Boston, June, 1983.

¹¹²David Frankil, Address to the Center for Ocean Management on the LOS, June, 1983, Kingston, RI, p. 3.

¹¹³Ibid., pp. 4-10.

countries.

3. There would be a drop in actual technology coming to the market relating to seabed mining, as the producers would be unable to gain a full return on their "research and development, manufacturing and marketing programs, and industrial innovation process."

4. There are significant overlaps between the technology that would be passed to the Enterprise and developing countries and security-sensitive technology. The NAM cites examples from exploration equipment that "is closely related to technologies needed to both track and detect submarines and in commercial oil and gas mapping operations."

5. A capitulation on the seabed mining provisions would create a precedent that would overlap in other fora. The NAM cites the Paris Convention talks as an example.

6. The NAM cites other concerned groups, including the L.E.S., the National Ocean Industry Association (NOIA), the Intellectual Property Owners (IPO), the American Patent Law Association, the U.S. Chamber of Commerce, the New York Patent Law Association, the Technology Committee of the

Canadian Council of the International Chamber of Commerce, the Canadian Business Industry International Advisory Council, and others, all of whom share the NAM concerns.

Mr. Frankil commented, "The LOS technology transfer provisions, as well as proposed amendments to the Paris Convention, represent attempts to achieve a New International Economic Order and redistribute knowledge, technology, resources, and funds from the developed world to the developing world."¹¹⁴

Overall, the NAM has the same negative approach to the technology transfer provisions espoused by the Chamber of Commerce and the Licensing Executive's Society, with roughly the same arguments.

National Ocean Industries Association

While the NAM and the Chamber of Commerce of the U.S. are fairly broad based lobbying groups representing huge numbers of highly diverse firms, the National Ocean Industries Association (NOIA) is much more specifically directed. Their membership consists of over 450 firms

¹¹⁴Ibid., p. 12.

specializing in ocean exploitation and management. A list reads like a "who's who" of the ocean industry. Their leading spokesman before Congress, Richard Legatski, has been a consistent critic of the technology transfer provisions of the Treaty before numerous Congressional committees. In testimony before Congress, Mr. Legatski detailed eight major problems with the technology transfer provisions of the Treaty:

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1. In some instances, the transfer would be mandatory, thus making it impossible to conduct an arm's length negotiation and arrive at the "meeting of the minds" essential to a normal commercial contract.

2. Technology is defined much more broadly than in commercial practice, to include the very essence of the engineering skill which permits owners of an advanced technology to maintain a competitive advantage in the marketplace.

3. Employees of the Enterprise who misuse confidential or proprietary information after a transfer are subject to only token penalties, so the risk of commercial or military espionage is quite real.

¹¹⁵Mr. Richard Legatski, National Ocean Industries, Interview, Washington, July, 1982.

4. There is no equivalent to patent protection on the high seas, since U.S. patent law is not extraterritorial in effect.

5. Should a loss of proprietary information occur, the text provides no compensation whatever for the owner of the affected technology.

6. Any technology not made available to the Enterprise must also be withheld from the resource company which is seeking the right to mine in the first instance, so that the resource company may not be able to conduct operations, for want of needed equipment, and the technology supplier will lose a market.

7. The burdens imposed on technology suppliers would create a disincentive to innovation, thus damaging the economies of all nations at least indirectly.

8. A tremendously damaging precedent would be set by entry into force of a transfer regime of this type, with the result that many other international commercial negotiations might be adversely affected.

Mr. Legatski emphasized repeatedly the very practical problems with the technology transfer provisions, deriding

those who believe that there is only a philosophic problem.

Another Attorney and Law of the Sea expert, Mr.

Northcutt Ely, also spoke before Congress at the request of the National Ocean Industries Association. He made many of the same points, emphasizing the difficulties of the
¹¹⁶
 miners:

"The private company must turn over its technology at forced sale prices to this competitor (the Enterprise). It cannot use any technology that it fails to transfer, even if the transfer is impossible because the technology is owned by a third person who refuses to consent or because the U.S. government forbids the transfer for reasons of national security, which it well may."

Overall, the NOIA, another powerful lobbying group in Washington, is strongly opposed to the Treaty's provisions on technology transfer. Mr. Legatski summed up the NOIA
¹¹⁷
 view in a letter to Senator Larry Pressler in 1982:

"In fact, the practical effect of the technology transfer provisions will likely be that no company or consortium operating under the laws of any nation which becomes a party to the LOS Treaty will be able to mine the

¹¹⁶ Northcutt Ely, Consultant, Letter, September, 1982.

¹¹⁷ Richard Legatski, Letter, 28 September 1982, p. 2.

seabed. This is because the operator will not be able to acquire the wide array of equipment and skills necessary to assemble a complete and efficient mining system. Many of the relevant technology suppliers, and the patent and intellectual property law specialists who advise them, have made it abundantly clear that transfers will not occur under the Treaty's terms."

National Foreign Trade Council

Another influential group with a direct interest in the Law of the Sea Treaty was the National Foreign Trade Council. Centered in New York City, the Council deals with important issues facing the American international business community. Their opinion on the technology transfer provisions of the Treaty was firmly negative. In an ¹¹⁸October, 1982 report, they commented:

"The owners of proprietary technology should not be required to transfer such technology to others. All transfers should result from a free choice of the parties as regards terms and conditions."

The Council committee cited the high costs of research

¹¹⁸ National Foreign Trade Council, "A Report on the LOS," (New York: Council of Foreign Affairs, 1982), p. 8.

and development, the great length of time necessary to bring a new technology to fruition, and the transfer of the technology to the developing states. The Council called for a "good faith cooperation between the Enterprise/Authority and the miners" to ensure the transfer of technology. They strongly objected to any coerced sale¹¹⁹ of the technology.

American Petroleum Institute and American Mining Congress

Two other highly influential industry groups with strong views on the technology transfer provisions of the Law of the Sea Treaty were the American Petroleum Institute¹²⁰ (API) and the American Mining Congress (AMC). Both of these organizations represent specific industries, and both have been strongly on record against the Treaty in general and the technology transfer provisions in general.

The American Petroleum Institute is a national trade association with over 8,000 individual and 320 company members representing all aspects of the petroleum industry. The institute has testified before Congress a number of

¹¹⁹ National Foreign Trade Council, p. 9.

¹²⁰ Spokespeople, American Petroleum Institute and American Mining Congress, Boston/Washington via Telephone, June-August, 1982.

times on the Treaty, the most recent being before the House Committee on Merchant Marine and Fisheries, July 27, 1982. In that statement, the API cited technology transfer as a "significant disadvantage in the Treaty" and said that "Provisions for accepting the mandatory transfer of technology as a condition precedent to developing seabed resources could deter technology development and could serve to prevent its application to seabed activities."¹²¹

The American Mining Congress, a similar organization within the mining industry, also is opposed to the Treaty and the technology transfer provisions of it. In a statement before Congress, they echoed the basic arguments¹²² of the API and other lobbying groups.

Survey of Worldwide Sample of Chief Executives

One excellent source of information about the attitudes of the business interests and multi-nationals toward marine technology transfer in the Law of the Sea context is the Conference Board, a non-profit, independent business research organization, which has been operating

¹²¹Statement of the American Petroleum Institute before the House Committee on Merchant Marine and Fisheries, 27 July 1982.

¹²²Statement of the American Mining Congress before the U.S. Senate, 15 September 1982, pp. 36-37.

from its New York base for more than 50 years. The Board has more than 4,000 Associates and serves 40,000 individuals throughout the world, performing research in the fields of economic conditions, marketing, finance, personnel administration, international activities public affairs, antitrust, and various other related areas,¹²³ according to its public relations officer.

Periodically, the Conference Board undertakes surveys to determine business opinion on a wide variety of topics. In 1976 they completed a major study on the subject of International transfer of technology. Their purpose was "to find out the views of senior corporate executives on a few of the issues raised by technology transfer between countries." Questions about the experience and attitudes of the chief executives were sent out to members of the Board's international panel of senior business executives. A total of 128 executives in 45 countries responded. A¹²⁴ breakdown of location follows:

Developing Countries: 42 Executives in 26 LDCs
 Industrial Countries: 86 Executives in 19 Industrial Countries

While the survey was not conducted on the specific

¹²³The Conference Board, Letter, 1 December 1982.

¹²⁴James Basche Jr. and Michael G. Duerr, "International Transfer of Technology: A Worldwide Survey of Chief Executives," The Conference Board Report, New York, 1975.

subject of marine technology transfer in the Law of the Sea context, the results are still quite revealing of the overall attitudes of business leaders towards technology transfer in general. The broad trends described in the report are significant for our analysis:

Three broad principles seemed to be commonly held among the chief executive officers of the worldwide
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corporations:

1. It is important to raise technological levels in the LDCs.
2. Needed technology must come from the corporations of the industrialized countries.
3. The transfer can be arranged in a way that is mutually beneficial.

The executives found themselves in disagreement over the best method of transferring technology. Some favored direct purchase through an open market system, similar to the views held by the majority of U.S. firms (as indicated by the Chamber of Commerce, NAM, NOIA, etc.) and their licensing executives (L.E.S.). Other chief executives felt that a preferred method of transferring technology would be

¹²⁵Ibid., pp. 1-20.

via direct foreign investment from the developed country to the developing country or other purchaser. Another method addressed by some was transferring the technology between governments. Interestingly, none of the respondents mentioned use of world organizations in a supra-national role, as in the Law of the Sea Treaty. This seems significant, as at the time of the survey, both the UNCTAD Technology Transfer Code of Conduct and the larger UNCLOS III talks were in full swing, events that these executives could not have been unaware of.¹²⁶ There seemed to be little faith in the world organization among the business executives, even the respondents from LDCs, who seemed to prefer that private business play the significant role in any transfer.

As to the price of technology, a division of viewpoint was fairly clear, as one would expect. The chief executives from the industrialized nations commented that prices currently (1976) paid for technology are fair, if not somewhat biased in favor of the buyers. On the opposite side, the chief executives from the LDCs (essentially the buyers themselves) stated by a 75%

¹²⁶G.K. Helleiner, pp. 295-316.

majority that the prices were in many cases too high, and that technology must be linked with part of a larger¹²⁷ "package." The industrial nation executives pointed to costs of development, servicing licenses, special risks, and petrodollar inflation as being part of the cost in vending technology. Many of the industrialized respondents further commented that the high prices are necessary to ensure that new technology is economically feasible to develop.

From the buyer's side, much concern was shown over balance of payments problems (in the LDCs) that make paying for much of the high priced but essential technology difficult or impossible. Many of the LDC executives commented that they would like to see the technology come to their countries on the basis of "package deals" that would bring not only the technology, but also further¹²⁸ development projects to their countries.

Insofar as how the technology should be transferred, the executives tended to respond in two broad groups:

1. Direct Purchase of Technology¹²⁹
2. Direct Investment

¹²⁷Basche and Duerr, The Conference Board, pp. 3-7.

¹²⁸Ibid., pp. 13-14.

¹²⁹Ibid., pp. 13-20.

While most of the executives felt that the governments of the nations concerned should be interested in the broad area of technology transfer, few felt that the governments should play an important role in directing it. Most seemed to think that either a direct payment based on a fair market price or a direct investment "package" would be equitable methods of transferring the technology. As mentioned earlier in this section, none of the executives mentioned the possibility of using an international clearing house, an international organization, or specifically the Law of the Sea context for transferring technology, although they have never been used in this capacity. This seems interesting and significant, since the UNCTAD and the UNCLOS talks were both at their peak at the time of the initial survey.¹³⁰

One chief executive from the U.S. spelled out several steps that he felt were key. These seemed to summarize the attitude of the industrial nations' executives as presented in this survey.¹³¹

"The government wishing to foster technology imports for maximum impact on the development process would include

¹³⁰ G.K. Helleiner, pp. 205-316.

¹³¹ Basche and Duerr, The Conference Board Report, p. 16.

the following among its policies:

1. In consultation with the private sector, develop a sound set of national plans and priorities for development that take maximum advantage of human and physical resources and identify the priorities to be accorded to capital investment in infrastructure, agricultural, and industrial development, and social progress.

2. Adopt internal domestic policies that produce the social and financial stability needed to control inflation and thus provide the possibility of an export flow sufficient to capitalize the development process.

3. Adopt policies on economic policy, tariff structures, and foreign investment designed selectively to encourage technology and capital goods imports consistent with economic development objectives.

4. Make the domestic investment in institution building, education, and training to permit the absorption of needed technological and managerial skills.

5. For those imports consistent with development objectives, provide adequate incentives for quality and price competition among foreign firms."

In other words, the general attitude among the industrial nations seems to be one that says to the LDCs: Get your house in order, i.e. achieve stability and get your infrastructure ready; then we (the corporations of the industrial world) will be willing to come to your countries and provide technology given adequate incentives and investment credits, i.e. money. While this can hardly be described as an altruistic, enlightened, or humanitarian attitude, it does fit with the general objectives and concerns of the modern corporation, whose main concern, indeed whose *raison d'etre*, is to maximize profits.

Overall, the voice of international corporations, as represented in this study, calls for private market solutions to the problems of marine technology transfer. The corporations of the industrial North are more strongly allied together behind free market determination of price, protection by patents and licensing, and use of either outright purchase or joint ventures to transfer the technology. The executives of the corporations in the LDC south also seem interested in private market solutions to

the problem of marine technology transfer, but are interested in some government control within the developing states in order to regulate competition, guarantee markets, and construct infrastructure. Both the executives from the North and South see a need for marine and other forms of technology transfer, and neither group mentioned the use of world organizations as a possible vehicle for such transfer. In this, both North and South corporate actors were out-of-step with their own national governments in the mid-1970s, when the poll was conducted. Governments in the North and South were turning at that time to the use of international organizations for technology transfer, as was discussed above.

Deep Seabed Mining Consortia

One group of multi-national corporations had a significant effect on the overall negotiations for the Law of the Sea Treaty and on the specific modifications and compromises to the sections dealing with marine technology transfer. This group of companies included the so-called

"Pioneer Investors," firms which as of the final round of negotiations included four private Western groups, two nationally sponsored Western entities, and two non-Western national consortia. As discussed in an earlier chapter,¹³² the major private consortia are:

KENNECOTT CONSORTIUM: Sohio, Rio Tinto-Zinc, BP, Noranda Mines, Mitsubishi

OCEAN MINING ASSOCIATES: US Steel, Union Miniere, Sun Chemicals, Ente Nazionale Idrocarburi

OCEAN MANAGEMENT INC.: INCO, Metallgesellschaft, Preussag, Salzgitter, SEDCO, Deep Ocean Mining

OCEAN MINERALS CO: Standard Oil, Lockheed, Billiton (Shell) BKW Ocean Minerals.

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The two Western nationally-sponsored entries are:

AFERNOD: Association Francaise pour l'etude et la recherche des nodules, including the Centre National pour l'Exploitation des Oceans, Commissariat a l'Energie Atomique, Societe Metallurgique le Nickel, Chantiers de France-Dunkerque.

DOMA: Deep Ocean Minerals Association, including Japanese firms banded together by their involvement in

¹³²J.K. Amsbaugh and Jan L. Van der Voort, "The Ocean Mining Industry," Oceanus, Vol. 25, No. 3, 1982, p. 25.

¹³³Ibid., pp. 25-26.

steel, trading, mining, metallurgy, etc.. There are over 35 firms in this consortium.

Finally, India and the Soviet Union have announced that they have state-run corporations that will be involved in deep seabed mining, although little factual evidence of involvement has been seen yet.

Overall, the influence of the multi-nationals is difficult to measure precisely. There is no real way to measure the impact the firms had over the course of the negotiations, and most of the actors involved, both on the side of the companies and in the administrations of the various governments, are reluctant to discuss the issue of direct lobbying for attribution. It is possible to cite the views of several executives from the major corporations involved in the mining on the subject of technology transfer. It is further possible to infer that these corporations were influential in the administrations of certain Western governments. Certainly the U.S., under the business-oriented Reagan Administration, paid attention to the attitude and weight of the consortia.¹³⁴ Suffice it to say, the attitude of the multi-nationals was felt in the

¹³⁴U.S. State Department sources, requesting confidentiality, Interviews, Washington, June, 1981.

Western delegations, and it is important to understand what the deep seabed multi-nationals thought about the technology transfer provisions.

One representative from the Kennecott Consortium, Marne A. Dubs, has testified on the Treaty before Congress and been very outspoken in representing the views of that firm on the subject of the Treaty in general and technology transfer in particular. Mr. Dubs was also a member of the "experts" panel selected to advise the U.S. delegation under the Reagan Administration. In a lengthy interview recently, he commented, "The technology transfer provisions of the draft treaty are absolutely inconceivable. They go against everything the U.S. has argued at international forums on technology transfer and are basically unworkable."¹³⁵ He went on to say that they are impossible for industry to comply with and make deep seabed mining difficult at best. According to Dubs, the key problems with the provisions as written are:¹³⁶

1. Definition of Technology is too broad.
2. Requirement that miners transfer third party technology to the Enterprise; it could be very difficult

¹³⁵Marne Dubs, Interview, Boston/Connecticut via Telephone, September, 1981.

¹³⁶Ibid.

for the miner to obtain the third party technology.

3. The technology would be passed not only to developing countries, but also to other developed countries competing with the U.S. firms in the deep seabed mining areas.

4. Sensitive technology vital to American defenses might be jeopardized.

5. Impossible to set a price on new technology.

6. If new technology is immediately passed on via transfer, the incentive to develop the new technology will diminish.

Mr. Dubs concluded by commenting that "industry is accustomed to transferring technology in the normal course of commercial operations. Such transfer is not mandatory and provides benefits for both transferor and transferee. The present provisions are a far cry from this, and I see
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no possible compromise in this area."

Another leading industry figure often called for testimony before the U.S. Congress is Mr. Conrad G. Welling, Vice President of Ocean Minerals Company, the California-based consortium founded by Lockheed and other

¹³⁷Ibid.

major corporations. He is also a leading spokesman for the American Mining Congress, and serves as co-chairman of the Undersea Mineral Resources Committee of the American Mining Congress. He recently commented on the subject of marine technology transfer in the Law of the Sea Treaty:

"The system of mandatory technology transfer to both the Enterprise and developing nations limits effectual access to the seabed because it provides a means by which the Authority may revoke contracts."

He went on to criticize the third-party restrictions on technology usage and the loss of appropriate return for the consortia on their investment in the advanced technology. Mr. Welling concluded his commentary by emphasizing that the technology transfer provisions of the Treaty are one of the primary problems with the
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document.

A third major consortium is Ocean Managment Inc., of which the leading partner is the International Nickel Company (INCO). Like the other consortia, they seem unhappy with the technology transfer provisions of the Treaty. In a recent letter, Mr. E. Keith O'Brien, the

¹³⁸Conrad Welling, Interview, Boston/Mountain Shadows, CA via Telephone, June, 1983. Letter, May, 1983.

director of Government Affairs, commented that "the present draft (Treaty) contains provisions that discourage commercial seabed development . . . " ¹³⁹ In an interview, he specified the technology transfer provisions as being a ¹⁴⁰ major factor in the company's dislike of the Treaty.

Overall, the deep seabed mining industry has stood firmly against the technology transfer provisions of the Treaty, generally with strong support from their governments. This close relationship between the industry and the government has been especially strong in the U.S.. As Kurt Shustreich commented in a recent study, "Much of the United States' domestic legislation and its negotiating positions at the LOS Conference concerning deep seabed mining have reflected the orientation of ocean mining ¹⁴¹ interests based in this country." He went on to outline three reasons for the "large role" played by the deep seabed mining industry in policy choices in the Treaty process:

1. Much of the research on deep seabed mining has been undertaken by the consortia, putting them in an advantageous position in providing data and experience on

¹³⁹ Mr. E. Keith O'Brien, Director of Government Affairs, INCO, Toronto, Canada, Letter, October, 1983.

¹⁴⁰ Ibid.

¹⁴¹ Kurt Shustreich, Resource Management and the Oceans (Colorado: Westview Press, 1982), p. 95.

the problems and issues.

2. Because of the knowledge and data, the industry has been very influential in placing its spokespersons in testimony before the U.S. and other national deliberative bodies. This is born out in surveying the Congressional¹⁴² testimony in the U.S. over the past eight years.

3. Finally, the industry has spent a good deal of money to retain professional lobbyists, who are able to frequently take an approach on the issues that might be¹⁴³ called "wrapping them in the flag."

Foreign Firms

Two of the most important of the foreign firms involved in deep seabed mining are AFERNOD, the French consortium, and DOMA, formed by the Japanese. Both are government-sponsored, but are in fact commercial entities. A representative of AFERNOD commented recently that the group had deliberately attempted to remain outside the negotiations, relying on the influence of the French government to direct the Treaty in "an appropriate

¹⁴²Over 40% of the Testimony before the House and Senate on ocean affairs came from industry lobbyists.

¹⁴³Dr. Benjamin Cohen, Discussion, Medford, MA, May, 1983.

direction." DOMA did not respond to several inquiries, but in its role as a government-sponsored group, it is thought that they also relied on their government to direct the negotiations. This is no doubt even more true of the Soviet and Indian entities, which are directly controlled by their respective governments.

Conclusions

Overall, the corporations (and their lobbying organizations and professional representatives) have had a significant influence on the issue of marine technology transfer in the Law of the Sea. Their strong opposition to the entire concept has been felt throughout the negotiations, but particularly as the provisions on mandatory transfer in the deep seabed mining context took shape. Their principle contribution to date, of course, has been negative in character---they helped defeat the idea of signing the Convention, and may well be instrumental in keeping the U.S. from participating in the

accord for the next several years or decades. Their objections to the marine technology transfer provisions have been clearly stated in this section by a wide range of spokesmen from the seabed mining industry and larger segments of corporate opinion. In the concluding chapter of the dissertation, a consolidated list of industry concerns will be presented, along with an analysis of their validity. This will be presented in conjunction with a similar summary and analysis of other actor's concerns.

G. The Developing Countries

For the developing countries, technology transfer was an important issue throughout the Conference. In this section, the focus will be on the attitude of the LDCs toward the technology transfer provisions in the Law of the Sea Treaty, with an emphasis on the Eleventh and final session of the Convention. After presenting the LDC viewpoints in this section, the final chapter will contain analysis and evaluation of the various concerns elucidated in this section.

The LDCs and Marine Technology Transfer

Most of the complaints raised by the developing countries concerning the marine technology transfer process as it exists in the world today are directed against the multi-national firms that control the technology. Many

¹⁴⁴Raymond Vernon, "Enterprise Strategies," The Contemporary International Economy (New York: St. Martin's Press, 1980), pp. 347-371.

of these charges appear over and over again in the debates of the various sessions of the UNCLOS III negotiations. One major concern of the developing nations was their desire to "unbundle" the various components of a technology package in order to assess the value of the various items of technology. They charge that too often they pay for large segments of technology they either already have, do not want, or do not need for technical or management reasons. The developing nations assert that they could often procure segments of the offered technology "package" more cheaply from other, less monopolistic sources.¹⁴⁵ The Group of 77, which addressed technology transfer issues very consistently throughout the Conference, has called for simple "unpackaging" in the selling of technology to the developing world.¹⁴⁶

The Group of 77 has also demanded that more information be made available to them concerning the activities and financial situation of the companies with which they do business. By having a more complete picture of the total operation of the multi-national corporation, the developing nations are convinced they can better direct

¹⁴⁵Dr. Adam Boleslaw Boczek, p. 18.

¹⁴⁶Ibid., p. 19.

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the transfer process. In this same vein, the Group of 77 has called for less restrictive clauses on the technology that is transferred to them, claiming that the "cumulative effect of inhibiting the build-up by the recipient countries" is the result of such unfair
 148 limitations. The developing countries would also like to see more of the research and development for the various
 149 technologies done in their countries. Ultimately, the major worry of the LDCs from commercial technology transfer is that it leads to a kind of subtle dependance, "which implies the imposition on the recipients of alien standards, structures, and cultural values, the stifling of the scientific and technological creativity of developing countries and the reinforcement of the economic and social
 150 dualism of those countries."

In the area of non-commercial transfer, the complaints of the developing countries are less focused. Commercial technology transfer has the convenience of presenting an easy target in the form of the "exploitative" multinational. Non-commercial transfer, both bilateral and multilateral, is more difficult to criticize. The donors

¹⁴⁷United Nations Document, TD/COND TOT 25, Preamble, p. 1; and Chapter 5 (2) (c).

¹⁴⁸Dr. Adam Boleslaw Boczek, p. 19. ¹⁴⁹Ibid., p. 20.

¹⁵⁰United Nations Document, A/CONF.81/11, p. 14.

are more often international organizations composed in large measure of the LDCs themselves, and even when the doner is a larger, industrialized nation, it is harder politically to attack a nation that is, after all, providing a service, albeit not precisely in the form desired by the recipient. In general, the developing countries feel that the international organizations are not doing enough to encourage, even mandate, marine technology transfer. The Law of the Sea talks are apt proof of this feeling. As a broader problem with the international organizations, "the concerns range from mistrust of the motive of the supplier, the ad hoc nature of the approach, charges of neo-colonialism, poor attitudes, and indifference to the interest of the less developed nations."¹⁵¹

Along these lines, the concept of reverse technology transfer (so-called "brain-drain") as well as a need to do better with cross-cultural communication during the transfer process is often mentioned.¹⁵² Some of the other commonly raised problems include:¹⁵³

1. Insufficient funding

¹⁵¹P. Waggener, "Transfer of Marine Technology," San Diego Law Review, Volume 12, 1975, p. 710.

¹⁵²Dr. Adam Boleslaw Boczek, p. 23.

¹⁵³Ibid., pp. 23-24.

2. Lack of opportunity to participate in the planning of the program

3. Duration of the program is too short

4. Communication problems

5. Bureaucratic obstacles

6. Lack of adequate background training among participants from developing countries

7. Inability to absorb the technology within the developing country's scientific and political systems

Although the developing nations look mainly to the world organizations to eventually address these problems, via such programs as UNCLOS III, the UNCTAD Code of Conduct negotiations, and the talks on the revision of the Paris Convention, it is interesting to note the attitudes of many of the business leaders from the developing world. While the national governments ask for greater participation by the world organizations, the chief executives heading many of the companies that would use the technology prefer private market solutions. While this can be attributed to some degree to the desire of most humans to work with

others from their own professions in solving problems (i.e. businessmen - businessmen, bureaucrat-bureaucrat) there does seem to be a serious communication breakdown between the public and the private sector in many of the LDCs that can only hamper their use of the technology and the process of obtaining it.

The responses of the developing nations to the problem of obtaining technology are varied. Many have passed national legislation that either attempt to induce an inflow of technology via incentives, special tax breaks, or good competitive circumstances for the firms with the technology. Some have tried to regulate or expropriate technology that is already within the border of their country.¹⁵⁴ This has led in some cases to inflows of technology quite beyond the ability of the nation involved to absorb it, and in other cases to bitterness and diplomatic recriminations. It can at least be said, however, that the world has not managed yet to come to war over marine technology transfer. In general, the energy of the Third World has been directed toward the international organizations, particularly during the decade of the 1970s.

¹⁵⁴G.K. Helleiner, pp. 294-297.

This is due to the LDC's perception that only in an organized, concerted forum would they (LDCs) have sufficient political strength to oppose the preponderant power of the industrial countries. As mentioned many times earlier in this dissertation, such efforts as the UNCTAD talks, the Paris Convention discussions, and UNCLOS III were all manifestations of this desire.

General LDC Views on Marine Technology Transfer and UNCLOS III

The general viewpoint of the developing countries on marine technology transfer was that it represented an important source of wealth and opportunity for their respective countries. Many of the developing countries further believed that the common heritage principle, which applied to the deep seabed, was also applicable to technology used to exploit the seabed. The redistribution reasoning also incorporated ideas of a sort of "repayment" to the developing countries in return for years of exploitation under colonial domination. These views were fairly clear from commentary throughout the Conference.

One of the leading spokesmen on marine technology transfer throughout the Conference was Mr. Vandergert of Sri Lanka. During the 1974 Session, he spoke at length on technology transfer in the Law of the Sea context. His comments are quite representative of the general LDC ¹⁵⁵ viewpoint during the early years of the Conference:

" . . . the rapid transfer to developing countries of the types of marine technology they needed were essential to enable those countries to derive maximum benefit from the wealth of the oceans, to obtain essential protein-rich food from the sea, and to participate fully in the exploitation of the seabed beyond national jurisdiction."

He further commented that so long as marine technology remained only in the hands of the industrial countries, the peoples of the developing world would be "unable to harvest effectively the resources of the sea which they so ¹⁵⁶ desperately need." His ideas on how to effect the transfer were also fairly typical of the G-77 viewpoint:

"The political system would usually make direct governmental intervention to compel transfer of the technology impractical or very difficult. The Conference

¹⁵⁵ Mr. Vandergert, Delegate from Sri Lanka, Discussion in the Third Committee, United Nations Document, E.75.V.4, 7th Meeting, 18 July 1974, (8).

¹⁵⁶ Ibid, (10).

should try to achieve a balance between the understandable financial and other considerations that motivated those who currently possessed the technology and the wider social considerations that called for its rapid transfer to the developing countries.¹⁵⁷ In further remarks, he called for transfer via direct technical assistance, training personnel, convening international conferences on selected technologies, joint ventures, trade, ensuring access by the developing countries to patented and non-patented technology under just and reasonable conditions, and study of the problems associated with the transfer. He concluded by saying that the developing countries had "cried out for technology for many years," but had received very little.¹⁵⁸

At the same Conference session, diplomats from many developing countries echoed the same themes. Mr. Hassan of the Sudan commented that the "Authority should coordinate all technical assistance programs and the transfer of technology."¹⁵⁹ Mr. Utun Myat of Burma called for a means for the developing countries to receive marine technology they would otherwise be unable to afford, implying the need

¹⁵⁷Ibid., (14).

¹⁵⁸Ibid., (15).

¹⁵⁹Ibid., (23).

for a mandatory, pre-financed method of transfer. Mr. Booh of the United Republic of the Cameroon commented as well on the financial problems faced by the developing countries. He called for attention to resolution 39 (III) adopted by the third session of UNCTAD in 1972, asking for the developed countries to devote .05 percent of their GNP toward the solution of the technical problems of the developing countries and a 10 percent R&D commitment for the problems of developing countries. He stated that to do otherwise would increase the dependence of the developing world on the industrial countries, infecting the "realm of the seas" with the same problems of dependency as on the land.¹⁶⁰

Discussions along the same lines continued through the mid and late 1970s. During a later session, Mr. Rodriguez of Venezuela pointed out that it was "in the interest of the whole international community to seek ways of narrowing the technology gap by facilitating the transfer of technology from the developed countries to the developing countries."¹⁶¹ This, he felt, would necessitate clear, exact, and general provisions concerning the transfer of

¹⁶⁰ Ibid, (29-53).

¹⁶¹ United Nations Document, E.75.V.4, 8th Meeting, 19 July 1974, (39-43).

technology, and should cover a wide range of marine technologies. He pointed to the need for a very wide definition of technology in order to assure an efficient, complete transfer that left the developing countries with a full range of marine capabilities. To do otherwise would be to turn the common heritage over to only the few developed states with the technology to mine it. He cited five specific points worth mentioning, as they sum up the LDC position neatly:

1. Priorities set by receiving countries must be taken into account without narrowing their options
2. Technology should cover a very wide range of subjects of importance to marine science
3. The technical and scientific structure of the developing country must be taken into account
4. Organizations and institutions that encourage the international transfer of technology must be given greater support
5. Developed countries must take action at home to provide the developing countries with access to all sources of technology without any discrimination.

¹⁶² Ibid., (42).

6. Direct and indirect costs of the transfer of technology could be very high and economically weaker coastal states barred from a more intensive and rational exploitation of the sea by economic and financial difficulties in acquiring advanced technology must be avoided. Mr. Rodreiguez concluded by commenting, "What was involved was not international assistance but justice¹⁶³ between peoples."

Another active commentator from the developing countries was Miss Aguta of Nigeria. During one mid-1970s session, she commented at some length on ideas concerning marine technology transfer. She believed that the most effective means of transfer was through training and education. Three methods of achieving the transfer were 1) the creation of regional centers for transfer, 2) implementation of training programs in developed countries, and 3) controlling contracts by insisting on provisions that led to training of developing country individuals as a price for developed country exploitation of the seabed. At the same session, Mr. Kakodkar of India urged that the International Seabed Authority should act as a general

¹⁶³Ibid., (50).

resevoir to which all nations should contribute their technology and from which all nations could draw. This idealistic and somewhat collective approach was also at the base of much of the entire seabed mining portions of the Treaty, and were greeted with skepticism by the West.¹⁶⁴

Much of the early enthusiasm over the technology transfer provisions was written into the early drafts of the Treaty, including the ICNT, RSNT, and other versions. One of the ideas that developed from much of the idealistic and ideological aspects of the LDC conversations in the mid 1970s was the concept of concessional payment. This was finally expunged from the text at the insistence of the developed countries, but was embodied in a proposed Article 5 of Part XIV, which read in part:¹⁶⁵

"The transfer of technology shall be made to the developing countries at a concessional rate of payment taking into account their economic capacity and needs for development."

This proposed Article received wide support from the G-77, and was specifically championed by Nigeria, Kenya, and other important African and Latin American developing

¹⁶⁴Ibid., (14-15) and (61).

¹⁶⁵United Nations Document, A/CONF.62/C.3/1.12/Rev.1 UNCLOS III, Official Records, 198-199, E.75.V.10, (5).

countries. Much of the argument in favor of the concept was linked directly to "the concept of the common heritage of mankind and the universal concern for the developing countries."¹⁶⁶ During this period, the developing countries would often point to the work of the other U.N. organs working on technology transfer and argue that a consistent linkage had to be maintained.

Basically, then, the arguments of the developing countries were strongly in favor of technology transfer. There was occasional discussion pertaining to the question of mandatory technology transfer, but for the most part the developing countries believed that their arguments, both idealistic and practical, would carry the day. The gradual movement of the technology transfer discussion from the Third Committee (Scientific and General Technology Transfer) to the First Committee (Seabed Affairs) proved to spark the controversy over the mandatory transfer aspects of the issue. Much of the following problems erupted in the controversial, final eleventh session.

¹⁶⁶United Nations Document, 4 UNCLOS III, Official Records 101-104, E.75.V.10, 22nd Meeting, 25 April 1974, (3-7).

The Eleventh Session and the LDC Viewpoint

In many ways, the Eleventh and final session of UNCLOS III was the most revealing. The story really began on March 3, 1981, when the newly installed administration of President Reagan announced that they were leaving the Law of the Sea talks to conduct a comprehensive review of the progress to date.^{166a} The activities of that review and the general attitude of the U.S. and other industrial nations are covered later in this section. Sufficed to say here that after an intensive review and a more or less complete replacement of the negotiations personnel, President Reagan announced on 29 January 1982, almost a year later, that the U.S. would rejoin the UNCLOS III project, although under condition that it would work to renegotiate the agreement.¹⁶⁷ In his statement announcing the return of the U.S. he mentioned six "changes necessary to correct . .

Treaty."¹⁶⁸ One of his six objections was that the "convention should not contain provisions for the mandatory transfer of private technology."¹⁶⁹ In supporting the President's comments, Ambassador James L. Malone, Special

^{166a} Ronald Reagan, Presidential Statement, 3 March 1981.

¹⁶⁷ Ronald Reagan, Presidential Statement, 29 January 1982.

¹⁶⁸ Ibid.

¹⁶⁹ Ibid.

Representative of the President for UNCLOS III, further
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explained:

"There is a deeply held view in our Congress that one of America's greatest assets is its capacity for innovation and invention and its ability to produce advanced technology. It is understandable, therefore, that a Treaty would be unacceptable to many Americans if it required the United States, or more particularly, private companies to transfer that asset in a forced sale." Ambassador Malone made the comments on February 23, 1982, and less than two weeks later, the Eleventh Session of UNCLOS III opened in New York. It was as if the President of the United States and his Chief Ambassador had fired warning shots before re-entering the Conference.

The LDC reactions throughout the Eleventh Session, on marine technology transfer and other aspects of the Treaty, were clear and direct.

The catalyst for much of the LDC reaction was the U.S. submission of a revised, rewritten version of the Treaty. This document, which was presented in a green, bound format by the U.S. representatives, was greeted with

¹⁷⁰ Ambassador James Malone, Testimony before the House, text supplied by Department of State, 23 February 1982, p. 1.

overwhelmingly negative reactions from the LDCs. Due to its green covers, it was referred to as "the Green Book" throughout the session.

The first round of reaction to the comments were from the spokesperson for the Group of 77, Inam Ul-Haque of Pakistan, who said, "for the United States to submit at this time a paper which goes back to concepts and ideological preferences that were discussed comprehensively and either discarded or provided for by the consensus in the text, would set the negotiations back to the early
¹⁷¹seventies." He went on to say that the Group of 77 would not be interested in discussing the range of options contained in the U.S.'s circulated list of proposed changes. He further commented that any state which entered into an outside arrangement (the "mini-treaty" solution) would be denounced by his group. He concluded by saying, "The Group of 77 could not permit the destruction of a package so laboriously arrived at after long and intensive negotiations. It cannot barter away its inherent rights to the seabed and technology. There must be a convention universally applicable and preferably universally adhered

¹⁷¹Bernard Nossiter, "Third World Pact on Sea is Planned," New York Times, 9 March 1982, p. 17.

to. No unilateral exploitation of the common heritage of mankind . . . can be permitted."¹⁷²

The Group of 77 moved to block any changes to the sections of the draft convention relating to marine technology transfer. The Western nations formed into various blocks which directed the strategies to change the draft Convention as it stood at the opening of the conference. The two major blocks of Western nations involved in negotiations over the issues of marine technology transfer were the following:¹⁷³

A. Group of 7: U.S., Belgium, France, Federal Republic of Germany, Italy, Japan, and the United Kingdom (A/CONF. 62/L. 121)

B. Group of 11: Australia, Austria, Canada, Denmark, Finland, Iceland, Ireland, New Zealand, Norway, Sweden, and Switzerland (A/CONF.62/L.104)

The proposed amendments from both G-7 and the G-11 were fairly extensive, and were an attempt to deal with many of the outstanding issues raised by the United States in the "Green Book." Both sets of proposals contained provisions that would have reduced the severity of demands

¹⁷²United Nations Document, UNCLOS III, A/CONF 62/L.121 and A/CONF 62/L.104.

¹⁷³Ibid.

on contractors for transferring technology to the Enterprise and the Authority, and thus to the developing nations. The G-7 and G-11 proposals will be discussed in more depth in the next section of this chapter. Our interest here is rather in the general reaction of the G-77 to the three major proposals placed before the Convention dealing with marine technology transfer, namely the U.S. Green Book, the G-7 and the G-11 amendments. They are of interest in this section on the developing countries because of the revealing responses of the LDCs to the various proposals.¹⁷⁴

As mentioned above, all three sets of amendments contained provisions which would have considerably reduced the mandatory obligation to participate in technology transfer.¹⁷⁵ The amendments were proposed on 13 April, after the Convention had voted on 7 April to allow separate amendments to be placed before it for consideration. The Conference allowed 87 speakers to comment on the amendments over the course of six meetings from 15-17 April. The Conference then tried to reach a general agreement, but failed to come together on the vast majority of the issues

¹⁷⁴ U.S. Proposals for Amendment to the Draft Convention on LOS, supplied by the Department of State, March, 1982.

¹⁷⁵ Ibid.

proposed, including the marine technology transfer question. President Koh on 26 April dramatically announced that "the Convention could be at stake today," and asked the delegates not to press their various amendments to a vote, which he felt could "jeopardize the prospects of our being able to adopt a convention by consensus or without a vote."¹⁷⁶ Faced with the overwhelming opposition of the G-77 and the Conference leadership, the Western nations withdrew their proposals (the "Green Book", G-7, and G-11)¹⁷⁷ on the same day. Within the dialogue and response of the G-77 to a challenge to the mandatory technology transfer rules, the most revealing pattern of argument emerged.

After the three sets of amendments were introduced by their respective sponsors, the first commentator was the Chairman of the Group of 77, Alvaro de Soto of Peru. On 15 April, he opened the response of the developing nations by immediately asking the Western nations not to seek such major changes in the key provisions of the Treaty, including the "transfer of seabed technology to the Authority."¹⁷⁸ He cited the exploitation of the common heritage by the advanced countries possessing the

¹⁷⁶United Nations Document, SEA/485, 26 April 1982, p. 1.

¹⁷⁷Ibid.

¹⁷⁸United Nations Document, SEA/478, 15 April 1982, p. 1.

technology as a violation of the basic principles of the accord. He further alluded to the absolute right of the developing countries to technology they needed to equitably exploit the oceans. The delegate from Tanzania followed with the comment that the new, Western proposed amendments would "remove the obligation to transfer technology from the seabed miners to the Authority,"¹⁷⁹ thus undermining the power of the Authority in the Area. He went on to fault the amendments of the West for "failing to pinpoint who would be held responsible for the transfer of technology to the Enterprise, and they (the amendments) sought to remove whatever obligations there had been."¹⁸⁰ This was identified as a crucial, central portion of the entire agreement. He concluded on a bitter note, saying, "We feel we have been taken for a ride for eight years. It has been a saga of broken promises. We feel betrayed, and it is not easy to negotiate with confidence."¹⁸¹

In the same vein, Yussef Robleh of Somalia commented that his nation opposed the amendments in toto, since they would undermine the "mini-package" on the seabed.¹⁸²

Algeria, Mozambique, Cuba, and Thailand all added their

¹⁷⁹ Ibid., p. 4.

¹⁸⁰ Ibid., pp. 4-5.

¹⁸¹ Ibid.

¹⁸² Ibid., p. 6.

rejection of the Western amendments shortly thereafter.¹⁸³

Zaher Al-Kindy of Oman summed up the Group of 77 reaction by commenting acidly that "only amendments that had a real chance of being approved by the Conference should be submitted."¹⁸⁴ The developing countries, while willing to talk, were viewing the new package of amendments as a sort of betrayal of the long years of negotiation that had gone into the package. As discussed in Chapter III of this dissertation, the macro-deal of strategic transit for a developing world-oriented deep seabed regime had been broken by the Industrial countries, at least in the eyes of the developing world.

On 16 April, more Third World voices continued to respond to the changes proposed in the Treaty. Sierra Leone specifically mentioned the technology transfer changes, rejecting any new ideas in what had been painfully negotiated over the previous years. Trinidad and Tobago echoed the same fears of re-opening the issue at the final session. Libya, Bulgaria, Indonesia, and Gabon all spoke out against the new versions of the technology transfer provisions.¹⁸⁵ W.T. Van Tonder of Lesotho proposed a

¹⁸³United Nations Document, SEA/479, 16 April 1982, pp. 6-7.

¹⁸⁴United Nations Document, SEA/480, 17 April 1982, pp. 1-1B.

¹⁸⁵Ibid.

"common heritage" amendment as a counterweight bargaining chip to the Western nations that would have mandated funds from the offshore continental shelf for a common fund going toward technology transfer to the LDCs.¹⁸⁶ This threat of issue-linkage between technology transfer and the much desired (by the industrial countries) EEZ provisions was a viable threat with considerable political backing among the Third World delegations.¹⁸⁷ Jaouida Tnani of Tunisia commented that the present text was the balanced one, and expressed the hope that the sponsors of the proposed amendments would not press them.

In order to fully hear debate and commentary on the proposed amendments, the Conference began night sessions, and the Group of 77 continued to criticize the marine technology transfer provisions in the proposals, as well as the entire package of Western ideas. As the debate continued, it became increasingly clear that only in the area of "grandfathering" some of the pioneer investors (most of whom were multi-nationals chartered in Western countries) could any compromise be worked out. In the area of marine technology transfer, as well as the rest of the

¹⁸⁶United Nations Document, UNCLOS III, CONF 62/L.115, 16 April, 1982..

¹⁸⁷Suzanne Tongue, Interview, Medford, MA, March, 1983.

proposed Western amendments, the Group of 77 was adamantly opposed to any change at the late date. Virtually all of the major delegations from the Group of 77 spoke out in the three day debate, and the solidarity of their tone was remarkable. There simply wasn't room for compromise on the general question of the seabed provisions of the Treaty, nor on the specific question of mandatory technology transfer. Their position, which had gradually been formed through the "development decade" of the 1970s, had hardened. Although frustrated in their efforts to effect a change in the Paris Convention or to write a definitive UNCTAD Code of Conduct, the developing countries were resolved to pass a Law of the Sea Treaty that would mandate technology transfer, at least of seabed-related marine technologies. They were resolved to do it with or without the industrial nations, particularly without the United States if necessary. It is instructive to glance again over the delegates quoted in this chapter---the range spans ideological and political gamut from the left to the right, from pro-West to pro-East to the few truly non-aligned. On this issue, as on few others, the Third World was

singularly together.

In the face of the determined opposition from the developing world, the Western nations finally dropped their proposals on the 23rd of April. They remained opposed to the technology transfer provisions of the Treaty, and their (the Western) objections will be examined in the following section. At the end of the Eleventh session, however, there was one of two feelings among the Western delegations in the face of the developing intransigence: Either the current wording and text was the "best that could be gotten"; or it was simply unacceptable and would eventually preclude signature of the Treaty. France and Japan, for example, eventually simply accepted the good with the bad, so to speak, and have signed. The U.S. and Britain, on the other hand, simply pulled out of the process to varying degrees, leaving the regime in a sort of limbo.

The most remarkable aspect of the entire developing world attitude toward technology transfer is the relative consistency and unity of their approach on the issue. It seems to transcend many political and economic differences between the incredibly varied group of countries, giving

them a large measure of leverage on the issue when dealing with the more powerful but often divided West.

We have examined the stated positions of the developing countries with respect to marine technology transfer in the Law of the Sea context. In the final chapter, a summary and consolidation of the overall developing world position will be presented with concurrent analysis and evaluation.

H. The Western Industrial Countries

The bulk of the world's marine technology is concentrated in a group of countries that can loosely be termed the "Western industrial countries." For our purposes, we shall consider the group to include the United States, Japan, the countries of Western Europe, Canada, Australia, and New Zealand---the membership of the Organizations for European Cooperation and Development (OECD). While some marine research and development is being undertaken in other countries, notably India, Brazil, China, Pakistan, Indonesia, and the USSR/Eastern block nations, we shall confine our analysis to the Western industrial countries noted. These countries perform not only the bulk of the research and development concerning marine technology, but are also more readily identifiable as a group in terms of their attitudes and policies toward marine technology transfer in the Law of the Sea

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context. For our purposes in studying the general attitude of the advanced industrial nations toward transfer, we can divide our approach into two major sections: The United States; and others. We shall conclude this section by attempting to synthesize a combined position for the "industrial nations" as a whole, or at least major blocks of countries.

United States and Marine Technology Transfer

It is important to say at the outset that there is no single "United States position" on the issue of transferring marine technology in the Law of the Sea context. While our analysis will focus on the public statements and actions of the U.S. government as indicated by pronouncements on the Law of the Sea negotiations, several factors must be remembered in trying to assess the overall position of the country (or any other nation's). First of all, due to the political process in the United States (and most Western democracies), the government

¹⁸⁸Dr. David Ross, Senior Scientist, Woods Hole, Interview, Woods Hole, MA, December, 1982.

changes at regular intervals. This can lead to dramatic shifts in the "United States position" on transfer. The most dramatic example of this, of course, was the change from the Democratic administration of Jimmy Carter to the conservative Republican government of Ronald Reagan. The United States performed a sudden volte-face both on the particular issue of marine technology transfer, as well as on the broader issues of the Law of the Sea talks and North South relations in general.¹⁸⁹ This shift and its implications on the issues in this dissertation will be covered below, but suffice it to say at this point that the official position of the U.S. on the Law of the Sea is subject to change from national election results.

Second, business interests in the United States enjoy a great deal of relative freedom in their operations and decisions. There are few legal means at the disposal of the U.S. government to force the transfer of marine technology, even if the government was disposed to do so. It is therefore necessary to take into account the broad position of U.S. corporations and their spokesmen in assessing the country's overall position on the issue.

¹⁸⁹ Elliot Richardson, Interview, Washington, DC, June, 1981.

This has been covered in an earlier section of this chapter, and it will be lightly touched on here. It is obvious as well that business influence increases during the tenure of more conservative, free-market Administrations, and diminishes during Democratic, less free-market oriented periods. It is therefore particularly important to understand the role of U.S. business in the formation of current U.S. government positions on marine technology transfer.

A third competing source of influence that participates in establishing the overall U.S. position is the military. The Defense establishment, called the "largest single organization in the free world,"¹⁹⁰ had considerable leverage in the Law of the Sea talks due to questions over security ramifications of technology transfer and concern over strategic transit for U.S. forces.

Finally, several smaller voices contribute to the formation of what can only be described as a sort of U.S. "consensus" voice on the issue. Included here are academics, writers, public opinion, media, etc. We shall

¹⁹⁰ Thomas Abbott, Assistant to the Secretary of Defense, Interview, Washington, DC, March, 1982.

touch on this welter of opinion briefly in trying to arrive at an overall evaluation of the position of the United States

Government in the U.S.

Naturally, the largest single voice, and certainly the most obvious one in determining U.S. public policy, belongs nominally to the government, meaning primarily the executive branch. While the formation of policy within the USG is a complex and sometimes byzantine process beyond the scope of this dissertation, it is necessary to point out that USG policy on the Law of the Sea issues has generally been handled by the formation of "inter-agency groups," which include representatives from virtually the entire gamut of USG agencies. As an example, the inter-agency working group (IG) that dealt with the review of the Law of the Sea in 1981 consisted of representatives from the
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following USG agencies:

¹⁹¹U.S. Government Document, Message, From Secretary of State to Head of U.S. Mission, Geneva, 3 July 1981.

Department of State (Including Representatives from
 over 10 different sections of the Department)
 Department of Defense
 Joint Chiefs of Staff
 Presidential Staff
 Department of Transportation/U.S. Coast Guard
 Department of the Interior
 Department of the Treasury
 Department of Commerce
 Department of Energy
 CIA, DIA, NSAS (Intelligence Agencies)
 NSC (National Security Council
 Various ad hoc members representing other constituencies
 within the government.

After the IG develops its recommendations in policy
 formation, its work is passed up to a Senior Inter-agency
 Group (SIG), which consists of representatives from
 virtually the same agencies, but this time with higher
 level players.

Recommendations from the SIG are normally then routed
 through the cabinet level officer responsible for the
 decision, converted into option papers if required, and
 sent to the President if necessary, for decisions. For the
 Law of the Sea issue, the Department of State was the lead
 agency and prepared option papers, talking papers, and
 final drafts of presentations.

For our purposes, we shall confine our analysis of the

¹⁹²Peter Cressey, Political-Military Section of the
 Department of State, Washington, DC, Interview, June,
 1981.

U.S. government position to the final outcome of the long and complex negotiating process within the structures of the administration. Our focus will thus be on the stated final positions of the President, leading Congressional figures, and official representatives of U.S. policy to the Law of the Sea talks, such as Ambassadors Richardson (Carter Administration) and Malone (Reagan Administration).

The United States government has not had a consistently held position on the issue of technology transfer. The great schism, so to speak, occurred when the Carter administration left office and the Reagan administration entered. Under President Carter, the negotiations were carried out under the overall direction of Ambassador Elliot Richardson, an experienced diplomat and former U.S. cabinet officer. The general position on technology transfer was basically pro-transfer under the general provisions of the Treaty, although there were concerns over the "Brazil Clause" and other aspects of the accord.

The original concept was proposed in 1976 by then-Secretary of State Henry Kissinger as "part of a package

designed to win support for the 'parallel system.'¹⁹³

Throughout Ambassador Richardson's tenure, dating from 1977, the basic negotiating position of the USG was to "confine the obligation to its accepted purpose and to make sure that it (the technology transfer provision) would not undercut the miner's chance for a fair return on his investment."¹⁹⁴ In 1980, speaking before he had left the Administration on October 4, Ambassador Richardson commented that the text of the Treaty (which remains virtually identical to that finally adopted by the Conference) would bar the Enterprise from invoking the technology transfer obligation "until after the contract is in effect, and until it had found, despite a good-faith effort including tenders for bids, that it cannot purchase the technology it needs on the open market."¹⁹⁵ Ambassador Richardson went on to explain that the Brazil clause, allowing the developing nations to receive technology via the Enterprise, was adopted over the "strong opposition"¹⁹⁶ of the USG. He explained, however, that in his opinion, this was a political, not a practical problem, as it is difficult to envision a developing nation's group becoming

¹⁹³ Elliot Richardson, Statement released by Department of State, 24 September 1983.

¹⁹⁴ Ibid.

¹⁹⁵ Ibid.

¹⁹⁶ Ibid.

involved in deep seabed mining and thus meeting the basic requirements for transfer of the technology. He stated, "It is far more likely, that they would choose instead to enter into some form of association either with the Enterprise or with a multi-national company, both of which will have technology."¹⁹⁷ He delivered these remarks before the American Mining Congress in San Francisco on September 24, 1980, and following the election of Ronald Reagan a few days later, resigned. The generally positive attitude of the Carter administration toward the Law of the Sea left with him, and the entering administration did not share his belief that the technology transfer provisions of the Treaty were acceptable.¹⁹⁸

Shortly after assuming power, the newly inaugurated administration formally informed the negotiators of the UNCLOS agreement that the U.S. "would undertake a thorough review of the current draft of the Treaty and the degree to which it meets U.S. interests in the navigation, overflight, fisheries, environmental, deep seabed mining, and other areas recognized by that convention."¹⁹⁹ One of the key sections of concern was the segment of the deep

¹⁹⁷Ibid.

¹⁹⁸Ibid.

¹⁹⁹Ronald Reagan, Presidential Statement, 3 March 1981.

seabed mining section of the Treaty that dealt with technology transfer. A senior inter-agency group headed by Judge William Clark undertook the review, which took a year to complete. On January 29, 1982, as mentioned earlier, President Reagan released a statement announcing that the United States would return to the negotiations and "work with other countries to achieve an acceptable Treaty."²⁰⁰ He cited six key areas of concern, all of which in one way or another indicated problems with the deep seabed provisions of the draft Treaty. In regard to technology transfer, he specifically stated: " . . . the convention should not contain provisions for the mandatory transfer of private technology . . . "²⁰¹ Shortly afterward, Ambassador James Malone, the newly appointed representative to UNCLOS III, echoed these thoughts even more sharply in testimony before the House Committee on Fisheries and Marine Affairs.²⁰² Clearly, the Reagan Administration had problems with the technology transfer provisions of the Treaty and these problems remained sharply in focus during the Eleventh Session in New York, March-April 1982.²⁰³

One of the best indications of the official U.S.

²⁰⁰ Ronald Reagan, Presidential Statement, 20 March 1982.

²⁰¹ Ibid.

²⁰² James Malone, Interview, Boston/Washington, June, 1982.

²⁰³ Ibid.

Government position was contained in the "Green Book", the proposed changes submitted by the Reagan administration at the start of the Eleventh session.²⁰⁴ This set of proposals provides a good overall portrait of the basic objectives of the U.S. in the question of marine technology transfer. The basic obligation would have been changed to read: "to co-operate with the Authority in the acquisition of marine technology on reasonable commercial terms and conditions for the technology necessary to carry out activities in the Area."²⁰⁵ The technology would have been limited to "technology which the contractor has made available or is willing to make available to third parties for use in carrying out activities in the Area."²⁰⁶ Also, the contractors would have had to assist the Enterprise, primarily by identifying sources of the technology and advising the Enterprise as to fair rates and terms of use. The amendments would have prevented bringing in third parties holding technology into disputes between contractors and the Authority under the dispute settlement clauses. Additionally, states would have had to undertake some of the obligation for ensuring technology transfer.

²⁰⁴ U.S. Proposals for Amendment, March, 1982.

²⁰⁵ Ibid.

²⁰⁶ Ibid.

The U.S. position also included changes that would have
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accomplished the following:

1. Technology transfer could be invoked during the first ten years only after the start of commercial seabed production.

2. Technology transfer obligation to developing nations would only apply where the Enterprise had not already received the technology.

3. Miners could use technology without obtaining permission from the owner of the technology that it would be available to the Enterprise if requested.

4. Deleted the clauses that a miner's refusal to provide technology would be held against him in future requests for prospecting.

As will be discussed in depth below, the U.S. proposals in the "Green Book" (at least with respect to technology transfer) formed the basis of the proposed amendments by the G-7 and G-11 as well.

Overall, these provisions give a fairly clear idea of where the current administration stands on transfer of marine technology. The United States government desires a

207 Ibid.

deep seabed regime that is essentially free of mandatory technology transfer. The current administration is firmly wedded (on LOS and most other matters) to the principles of the market-place, and believes with equal firmness that technology transfer must and will take place most effectively in a free market.²⁰⁸ Their reasons seem to be at once ideological and practical. The ideology stems from a basic Republican conservatism that emphasizes the efficiency of free trade and free markets, and is suspicious of collectivized, "big government" schemes such as that implied by the seabed regime and the ISA. Indeed, in a recent interview, Brian Hoyle, the State Department "point man" on the Treaty since the U.S. rejection, commented, "They would use over 2,000 individuals to manage very little actual territory (20 mining stations).²⁰⁹ The practical objections to the Treaty's provision stem from the Administration's response to industry, which is firmly opposed to the Treaty's seabed mining and technology transfer provisions.

Overall, the U.S. government is strongly opposed to the Treaty, at least as embodied in the top levels of the

²⁰⁸This is clear from even the most cursory appraisal of Administration statements. See bibliography.

²⁰⁹Brian Hoyle, U.S. Department of State, Interview, Kingston, RI, June, 1982.

Reagan administration. This has been made quite clear through the direct action of the administration, the statements of the upper levels of the government, and the public pronouncements on the Treaty.²¹⁰

U.S. Business and the Law of the Sea

The attitudes of U.S. deep seabed business interests as well as U.S. business as a whole were described in the foregoing section entitled "Corporations". Suffice it to say, the full weight of corporate players in the U.S. was firmly against the Treaty, for the reasons described earlier. While there is no need to repeat their arguments here, it is important to bear in mind their overall influence in formulating the U.S. position on the Law of the Sea, particularly in a sympathetic administration.²¹¹

U.S. Defense Establishment and the Law of the Sea

A third major player in the establishment of the U.S. position on the issue of marine technology transfer in the Law of the Sea context is the Department of Defense and the

²¹⁰ Ibid.

²¹¹ Tom Alexander, Fortune, pp. 6-10.

associated services, notably the U.S. Navy. The defense establishment has been placed in an ambivalent position by the Law of the Sea negotiations. While it is strongly in favor of the Treaty as a whole because of the benefits of the straits passage, innocent passage, and high seas provisions, it is opposed to the strategic implications of the seabed mining section and the mandatory technology transfer sections. Even within the defense establishment, there has been much contention and argument over support²¹² for the Treaty. In general, the Navy has been a supporter of the Treaty, while the rest of the Defense²¹³ Department has been opposed.

Overall, the defense establishment sees the treaty as a trade-off. They are worried about the implications of mandatory technology transfer, which many in the Department believe might lead to technology leakage to opponents of²¹⁴ the U.S., particularly the Soviet Union. This fear is enhanced by the links between many developing countries, who could request and receive technology from the Enterprise, and the U.S.S.R.. It is further frequently pointed out that there are only nominal penalties for

²¹²Dennis Neutze, Staff of the CNO, Interview, Washington, DC, June, 1981.

²¹³Ibid.

²¹⁴Ibid.

employees of the Enterprise and the Authority for passing information and technology in an unauthorized fashion, which might lead to espionage, either industrial or security oriented. This issue has been raised by a number of critics of the Treaty, including Congressmen, Senators, and defense lobbyists. In fact, a comparison of the deep seabed mining technology and the security sensitive marine technologies compiled by the GAO show a clear linkage²¹⁵ between the two. The strategic and tactical implications of new missions at sea involved in enforcement and reaction to the Treaty and technology transfer have been weighed by defense planners, and the overall decision has been a rejection of the Treaty.

One naval officer and observer of the Treaty has thoroughly researched the accord and the defense establishment attitudes toward it. His conclusion was that the document's passage rights and other benefits for the U.S. could be provided by either customary international law or unilateral degree. He believes that the Treaty was ultimately rejected by the Defense Department for its technology transfer, seabed mining, and NIEO

²¹⁵John Breau, Congressman (LA), Interview, Washington, June, 1981.

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implications.

Overall, the defense establishment has alternately supported and rejected the Treaty. It has now moved into line with the decision of the Administration and rejected the Treaty, claiming it can find all the benefits it requires in customary international law while rejecting the drawbacks of the technology transfer provisions and other
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problems.

Academics and Writers in the U.S.

The most difficult opinions to analyze and factor into the overall U.S. position are the influential commentators and writers who write about the issue. Such "opinion leaders" can be enormously influential on given issues, although it can be difficult to establish direct linkages with cause and effect. Included in this category are the influence of academics, journalists, and public opinion in general.

In the area of marine technology transfer, and indeed in the broader area of the Law of the Sea Treaty in

²¹⁶Kevin Boreen, U.S. Naval Officer, Interview, Medford, MA, April, 1983.

²¹⁷Bruce Harlow, U.S. Naval Officer, Interview, Kingston, RI, June, 1983.

general, no distinct public opinion has emerged. It is doubted whether one American in a hundred is even aware of the Treaty in any but the most distant way. This can probably be attributed to the low level of publicity, the lack of interest most Americans have in the work of the United Nations in general, and the non-maritime orientation of large segments of the U.S. population. There is considerable public confusion and apathy concerning the myriad of acronyms that flash across their screens---UNCLOS looks pretty much like UNCTAD, UNIDO, OAS, etc. to the average American. While it is difficult to factor in the vagaries of public opinion, it is probably fair to say that if and when the issue comes to the U.S. Senate for advice and consent prior to ratification, there will be a renewed public interest. Whether public opinion at that time will be pro or con is difficult to say. It is interesting to note that several leading Senators (and, at this writing, Presidential candidates) have commented in letters that the Treaty would not pass the U.S. Senate in its current version. This is based, according to the legislators, on the technology transfer provisons, the other seabed mining

issues, and the support for "national liberation
 organizations" written into the Annexes to the accord. ²¹⁸

More important in shaping the U.S. position on the Treaty is the impact of journalists and writers, as distinct from academics, who will be examined below. Journalistic writing on the Treaty is usually uninformed and cursory, consisting mainly of reporting "what happened" and skimming the deep issues represented by the Treaty. The editorial comment of most columnists runs the gamut from conservative writers who oppose the Treaty (e.g., William Safire, William F. Buckley) to liberal supporters (e.g., the Boston Globe, Atlantic Monthly). The New York Times and the Washington Post have both supported the Treaty in print. While it is difficult to measure the depth of information or analysis that goes into some of the editorial comment, it seems on balance generally favorable to the Treaty.

In addition to professional journalists, some individual commentators have worked to make their views known on the Treaty. One of the most influential has been Elliot Richardson, the former Ambassador to the Conference

²¹⁸ Senator John Glenn, Senator Gary Hart, Letters, Spring, 1982.

and highly respected Republican cabinet officer. Mr. Richardson has supported the Treaty consistently via the work of a lobbying group he founded (Citizen's for Ocean Law) and his own speeches and writing.²¹⁹ In addition to Citizens for Ocean Law, a number of other pro-Treaty lobbying groups have been in operation in Washington, notably the United Methodist Project on the Law of the Sea, now defunct. Such groups sought to view the issue in its larger sense of a move toward world order, a theme reflected in the writing of many academics, as will be discussed below.²²⁰

One of the most consistently influential groups of "opinion leaders" in the United States, particularly on international issues, has been the American academic community. On the Law of the Sea issue, they have been strikingly pro-Treaty, in the sense of advocating that the U.S. sign the accord. Some of the leading academic figures in the debate include William Burke of the University of Washington, Daniel Cheever of Boston University, Jon Jacobson of the University of Oregon, Myres McDougal of Yale University, Louis Sohn of the University of

²¹⁹ Elliot Richardson, Interview, Washington, DC, June, 1981.

²²⁰ United Methodist Law of the Sea Project Information, Washington, DC, June, 1983.

Georgia/Harvard University, William Nyart of M.I.T., Bernard Oxman and Thomas Clingan of the University of Miami, among others. All have strongly advocated that the U.S. sign the Law of the Sea Treaty. Their views do not view the Treaty as unflawed---but they believe, as a group, that the document represented ten years of good, fair negotiations and was the "best that could be got," in the words of one writer.²²¹ Naturally, there are voices in the academic community that lean away from the Treaty as a flawed document. John Norton Moore, a highly respected professor at the University of Virginia's Center for Ocean Law, has called for a "two-track" approach---working for a better interpretation of the Treaty via the work of the Preparatory Commission, while at the same time negotiating a fall-back mini-treaty.²²² Others have mentioned the possibility of an accord among the industrial "hold-outs" and considered its weight and influence in international law.²²³

²²¹William Burke, Professor of International Law, University of Washington, Interview, Kingston, RI, June, 1983.

²²²John Norton Moore, Professor of International Law, University of Virginia, Interview, Kingston, RI, June, 1983.

²²³Anthony D'Amato, Professor of International Law, Yale University, Interview, Boston/New Haven, June, 1983.

Overall U.S. Position

Taking into account the various forces we have discussed as forming part of the overall U.S. position on the transfer of marine technology, it is obvious that the "official" view of those currently in power in Washington is opposed to the Treaty. It is also clear that there is the possibility of a shift in opinion and climate for the Treaty based on the underlying views of many experts and academics. The government under the present administration, however, is ideologically and practically opposed to mandatory transfer. Leaders in the Senate including the late Henry Jackson, Russell Long, Larry Pressler, John Glenn, Gary Hart, and others, have reservations about the Treaty and its ability to pass a Senate vote. Even Claiborne Pell, a long-time supporter of the Treaty, doesn't think the Treaty "has a chance of getting through the Senate,"²²⁴ mainly because of its deep seabed mining and technology transfer provisions. The defense establishment, an initial supporter of the Treaty, is now against it, believing that the technology transfer

²²⁴Claiborne Pell, U.S. Senator, Interview, Kingston, RI, June, 1983.

provisions are dangerous to U.S. security interests. American business is totally opposed to the technology²²⁵ transfer and the other seabed mining provisions of the Treaty. Only the voices of academics and independent experts are raised in favor of the Treaty, and even they are not overwhelmingly satisfied with the technology transfer provisions. When questioned on the dubious acceptability of the technology transfer portions, many observe that such problems could be "worked out" via practice or through further regulation in the preparatory²²⁶ commission. The vast majority of Americans do not have a clue about the Treaty. It is difficult to envision a scenario that could convince the bulk of policy makers to go along with the mandatory technology transfer provisions of the Treaty. At best, a Democratic administration (perhaps during a Mondale Presidency, for example) might try to sign the Treaty and fight it through the Senate after trying to change some of the offending provisions via further negotiation. In general, it is fair to say that at this point, the prospects of U.S. support for the technology transfer provisions of the Treaty are virtually

²²⁵Based on the opinions quoted above.

²²⁶Citizens for Ocean Law, Monthly Update, Fall, 1983, p. 1.

non-existent, with no strong hope of change visible in the near future.

Western Industrial Democracies and Marine Technology Transfer

The other Western industrial democracies espouse a variety of positions on marine technology transfer, although most are basically supportive of the U.S. position. The majority of them find the mandatory principles of marine technology transfer outlined in the Treaty too ideologically rigid. They tend to favor free market transfer, incorporating payments for the technology, viewing technology as a commodity like any other. Even though their statements indicate their basic agreement with the U.S. position, however, there is a split within the group---some are willing to compromise and accept the provisions as written, while others reject the Treaty as did the U.S., usually citing technology transfer as a major problem. Among the Western industrial powers who have

signed and are seriously considering ratifying the Treaty are Canada, New Zealand, Australia, France, and Japan. The non-signers presently outside the Treaty process include the U.S., the U.K., West Germany, Italy, Luxemburg, and the Netherlands. Those willing to sign are no more enthusiastic about the technology transfer provisions in the Treaty; they are willing to accept the bad with the good in the Treaty from their own standpoint.²²⁷

This schism became clear during the Eleventh Session of the Conference (March-April, 1982) and the final signing ceremony (December, 1982). During the final session, two packages of compromises were put forward by the industrial countries in their effort to shape the technology transfer portion (as well as the general sections on seabed²²⁸

mining). These two proposed compromises were initiated by two groups of the industrial countries, the G-7 and G-11.²²⁹

It should be said at the outset, that insofar as the technology transfer provisions were concerned, there was little difference between the original U.S. "Green Book" and the G-7 and G-11 proposals. The two groups each proposed changes in the technology transfer portions of the

²²⁷Homer Blair, Interview, March, 1982.

²²⁸United Nations Document, A/CONF.62/L.121 (7).

²²⁹United Nations Document, SEA/494, 30 April 1982, pp. 10-21.

Treaty that would have caused fundamental changes in the basic provisions, basically in conformation to the U.S.

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"Green Book" proposals:

1. Add a section obliging contractors to "cooperate with the Authority in acquisition by the Enterprise on fair and reasonable commercial terms and conditions of the technology necessary for the carrying out of its activities in the Area." --- The difference here is in the use of the word "cooperate" instead of emphasizing the mandatory powers of transfer granted the Authority.

2. Limit transfer to "technology the contractor is willing to make available to the Enterprise." --- This, of course, takes the teeth out of the entire transfer provisions.

3. Require the miner to "assist" the Enterprise in obtaining the technology --- Again, the explicit responsibility of the miner is reduced to good faith assistance.

4. Limit the required nature of the dispute settlement sections.

5. Assist (again, assist only) the Enterprise to

²³⁰ Ibid.

become a viable commercial entity.

6. States would be forced to assist in the technology transfer.

7. No special supplementary agreements necessary between the Enterprise and the miners about technology transfer.

8. Emphasize that the Enterprise would have to seek the technology on the open market.

9. Not penalize miners if they were unable to obtain permission to pass along third party technology.

10. References to penalties would be deleted from dispute settlement sections of the Treaty.

Overall, it is probably fair to say that the G-11 provisions were slightly closer to the original developing country positions on marine technology transfer, but were also far less restrictive in terms of the miner's freedom of action on the subject of technology. Both the G-7 and the G-11 proposals essentially removed the threat of mandatory technology transfer. The G-11 proposals, however, made it much more likely that the Enterprise would have full access to the necessary technology.

Overall, the industrial nations were not happy with the technology transfer provisions as written. They tried to change them, although some countries were more willing to compromise than others. It is interesting to note some of the comments made by the representatives of the industrial nations to the UNCLOS III Eleventh Session concerning the amendments and the technology transfer provisions of the Treaty as well.

The German representative commented: "Transfer of technology will certainly be the key for launching the parallel system, but due to the regulations . . . it may turn out to be one of its main impediments. The obligation to transfer third party technology will result in high additional costs for the contractor because of the litigation and delays."²³¹ He went on to complain about, "the idea of linking access for national contractors with the obligation to transfer technology to developing states." His thought was that ". . . the system provides sufficient ways and means for States to obtain the required technology by engaging in joint ventures either with the Enterprise or with contractors."²³² Ms. Edmonds Dever of

²³¹United Nations Document, SEA/477, 15 April 1982, p. 16.

²³²United Nations Document, SEA/478, 16 April 1982, p. 14.

Belgium commented that the amendments contained principles that her country had "defended since the start of the Conference."²³³ Several other sponsors of the amendments (Canada, Australia, New Zealand) all pointed out that the technology transfer provisions were a possible point of compromise, and that the entire package of amendments had been put forth in order to seek for a consensus agreement on the Treaty as a whole.²³⁴ Eventually, it became clear that the Group of 77 would not have accepted the amendments, as discussed in earlier sections. The amendments were not pressed to a vote after a plea from the Conference chairman for an effort at reaching a consensus agreement.²³⁵ The final vote on the Treaty was taken at 4:35 PM on Friday, 30 April, 1982, and the final tally indicated where the industrial countries had come out on the issues involved. Obviously, the issue of marine technology transfer can only be part of determining a country's voting position on the treaty package, but the results are useful as an indication of willingness to compromise. The industrial country vote was as follows:²³⁶

²³³ United Nations, SEA/480, 16 April 1982, p. 3.

²³⁴ United Nations, SEA/485, 26 April 1982, pp. 1-14.

²³⁵ Ibid.

²³⁶ "Sea Law-A Rendezvous with History," U.N. Chronicle June, 1982, pp. 3-13.

In Favor	Abstaining	Against
Australia	Belgium	U.S.
Austria	West Germany	
Canada	Italy	
Denmark	Luxembourg	
Finland	Netherlands	
France	Spain	
Greece	U.K.	
Iceland		
Ireland		
Japan		
New Zealand		
Norway		
Portugal		
Sweden		
Switzerland		

Although only the U.S. of all the industrial democracies rejected the Treaty outright, several of the other nations commented on their problems with the Treaty after the vote was taken. Jean Monnier of Switzerland said he "had voted for the draft Convention and its related annexes and documents in spite of some difficulties, including the . . . article on the transfer of technology, whose mandatory provisions could not be considered as precedent setting for the negotiations which were underway in other fora on the subject."²³⁷ Ernst F. Jung of West

²³⁷Ibid., p. 17.

Germany and Edmonds Dever of Belgium both commented on the need to continue the search for better balance in the seabed mining sections of the text, and Dever complained about the need for "realistic provisions on the transfer of technology."²³⁸ James Malone of the U.S. continued to²³⁹ espouse the standard American policy concerning the Treaty as currently drafted, which is that the "U.S. had serious problems with elements of the deep seabed mining provisions and would seek changes to meet six broad objectives that would make the Treaty acceptable to the U.S.," which included the call for an end to mandatory technology²⁴⁰ transfer.

Overall Western Industrial Position

The overall position of the Western nations on the mandatory transfer of marine technology is negative. The United States, particularly under the current administration, is strongly opposed to the provisions, citing them as one reasons for rejecting the entire Treaty. The rest of the industrial nations are opposed to mandatory

²³⁸Ibid.

²³⁹Ibid., p. 18.

²⁴⁰Ibid., p. 16.

transfer of technology, but some seem willing to compromise and accept the Treaty as drafted. Most of the Western powers who have accepted the Treaty have indicated that they will continue to work to soften the mandatory transfer powers via the Preparatory Commission and usage.²⁴¹ There is also some discussion among the signing Western powers that they will strongly deny the precedent setting character of the marine technology transfer provisions in other fora. Their ability to do this is disputed by many observers, however, who contend that having accepted mandatory technology transfer, they cannot pick and choose the application.²⁴² Only the future will answer that particular question. Suffice it to say, the Western industrial countries that signed the Treaty seem willing to accept the risks of the accompanying ideology to gain the advantages they perceive in having a coherent ocean regime. Undoubtedly, if more of the industrial nations actually refuse to ratify the Treaty, or if they band together and write a mini-treaty among themselves, the issue of technology transfer will receive further analysis and comment from their governments as one rationale for their

²⁴¹Homer Blair, Interview, March, 1982.

²⁴²Anne Hollick, Professor of Ocean Politics, M.I.T., Interview, Cambridge, August, 1983.

rejection of the UNCLOS Treaty. Those who have accepted the premise of mandatory transfer, however, may find themselves, like Lot's wife in the biblical tale of Sodom and Gommorah, unable to look back.

VI. ANALYSIS AND EVALUATION

Thus far in the course of this dissertation, a good deal of history, background, and broad political-economic discussion has been undertaken. Additionally, the marine technology involved in the Law of the Sea context has been surveyed. Finally, the viewpoints of four contending blocks of participants concerned with technology transfer in the Treaty have been examined: developing countries, the world organizations, the industrial countries, and the multi-national corporations. Each of these groups, in a broad sense, has a distinct set of goals, methodology, and principles pertaining to the issue of marine technology transfer in the Law of the Sea context, as well as a larger position on both the specific questions of the UNCLOS III Treaty and on the transfer of technology to developing countries as part of the NIEO and the international order.

In this penultimate chapter, the material covered

throughout the earlier portions of the text will be gathered together and analyzed and evaluated. This should lead to answers to two key research questions. In the first section of this chapter, an attempt will be made to answer the question; "How important was marine technology transfer to the emerging ocean regime and the Law of the Sea negotiation?" In the second, and much briefer section of the chapter, the question; "What are the implications of the technology transfer regime as it finally evolved for policy planners?" will be examined. Finally, in the next chapter, some specific recommendations and final conclusions will be made in order to answer the final research question, "How could the technology transfer regime be improved in order to induce full Western participation without losing the G-77?"

The Importance of Technology Transfer in the LOS Process

In approaching the importance of the technology transfer issue in the LOS process, it is necessary to examine the economic value of the technology, i.e. the

value of what was at stake; and the importance of the ideological precedent. In other words, the importance of technology transfer in the LOS process was a question of political economy in its purest sense---the economic component of the importance being tied to the value of the technologies and the resources they could exploit, and the political component tied to the importance of the mandatory precedent in the NIEO and other global fora. Both components will be examined below.

Value of the Technology

The first issue to examine in determining the importance of technology transfer in the LOS negotiating process is the value of the technology itself. As Chapter IV, "Survey of Marine Technology" suggested, the economic value of the technology involved is extremely high. Value is a function of potential income, and the potential return to investors from the seabed is very high. When the technology is unique and proprietary in nature (as is much of the information that would be liable for transfer), its

value is proportionally higher. Textual solutions, such as stating in the Treaty that a "fair and reasonable" or a "commercial" price will be paid for the technology is beside the point. It is impossible in practice to ascribe a value to a new invention with any degree of assurance, since it is quite difficult to predict the value of return to the inventor as he reaps monopoly profits as the sole holder of the technology. The key to the technology's value, of course, is the value of the resources involved. The total worth of the resource pool contained in the oceans, which the technology is designed to exploit, is inestimable. The entire world ocean covers over 70% of the earth's surface. The deep seabed and the high seas above it, some 42% of the world's surface, represent the largest single source of protein, minerals, hydrocarbons, and metals on the globe. These are, simply stated, the fuels that power societies. The advanced marine technology surveyed in Chapter IV and referred to in the rest of this dissertation is the key to unlocking that storehouse. Finally, the technologies involved in deep seabed mining have a wide range of uses in other situations. For

example, the search systems associated with deep seabed mineral exploration are very useful in anti-submarine warfare applications. Most of the marine technologies have a variety of uses, which increases the potential return to the inventor and thus the value.

Throughout the UNCLOS process, negotiators were certainly aware of the value of the resources associated with the deep seabed. It is no wonder that emotions and arguments ran high throughout the debates, given the value of the objective. The developing countries, of course, argued consistently that in accordance with the "common heritage principle", the resources of the seabed were for all mankind, not only for those possessing the technology to exploit them. This led, logically enough, to the conclusion that the tools of exploitation, the marine technology, would have to be available to those desiring to participate in the exploitation. In this, they were generally supported by the leadership of the world organizations, who shared their approach and goals. The industrial countries, on the other hand, already possessed the technology or the means to develop it. They were

therefore much more interested in obtaining a simple, legal regime that would permit immediate exploitation. They were supported, even goaded, toward this goal by the multi-national corporations expecting to participate in the exploitative process and holding the technology. Given their approaches, the LDCs and the world organizations were in favor of mandatory technology transfer provisions; the industrial countries and the multi-nationals were opposed. Both sides in the debate understood the value of the seabed wealth, even if neither could precisely measure it.

Before leaving this aspect of the issue, it is important to differentiate between the mandatory technology and encouraged technology transfer. In theory, only the technology associated with deep seabed mining (i.e. associated with the exploitation of the "common heritage") will be liable for mandatory transfer under the provisions of Part XI and Annex III. In practice, it will be difficult to draw the line. If all the technology associated with deep seabed mining is liable for mandatory transfer, it could well cover a very broad range of technologies indeed. The actual mining equipment, the

systems for lifting the minerals to the ship (complex hydraulic systems with wide applications), the ships themselves, including all aspects of their construction, propulsion, and navigation, the ocean energy devices that power the stations, the artificial island technology where the processing stations are located, the transport systems for the ore from ship to shore, the processing system itself, the transport from artificial island to shore--- where does the chain of technology end? The technologies mentioned even in the sequence above would represent most of the major marine technologies employed in the oceans today, particularly if prospecting and submersible vehicle operations were thrown in as well. It is not unlikely that hydrocarbon exploitation will soon be encroaching on the "Area." At that time, the technologies involved in that complex and expensive process would be under the mandatory category. Finally, it is possible to interpret the Treaty in such a way that deep sea fishing technology and information could be liable for transfer. While there is no certainty that such transfers would occur, the Treaty is written in an ambiguous manner that could be challenged on

a variety of points, with expensive and proprietary technologies involved.

Overall, then, the value of the technology and the resources it is designed to exploit is considerable. While difficult to estimate, it would certainly approach trillions of dollars if the value of the seabed resources were considered. The value of the technology itself, often touted as the saviour of societies in this day and age, would certainly be in the hundreds of billions of dollars. Thus, it is clear that the economic value of the technology and the resources was high throughout the Conference. Second, the value of the technology and resources was increasingly apparent to the delegates to the Convention, based on their speeches and statements. This awareness was particularly acute in the decade of the 1970s, when prices for basic commodities involved (oil, manganese, cobalt) were shooting up, and the supply was being arbitrarily interrupted by political unrest. The delegates, along with the rest of the world, were given frequent lessons in the value of the raw materials involved via the daily press. At the same time, older, "smokestack" industries were

failing in the industrial world and "high technology" was becoming the buzz-word of the later 70s. The LDCs' growth was slowing and it was becoming increasingly clear that new technologies could be key for both the developing and the industrial world. The net result was an acute sense of the critical value of obtaining technology on the part of the LDCs and on protecting it from the viewpoint of the industrial countries. The economic component of the technology transfer process was extremely important, and contributed to the high level of importance attached to the question by most of the Law of the Sea delegates.

Political Precedents and Technology Transfer

From a political standpoint, the debate over marine technology transfer in the Law of the Sea negotiations was vitally important. This was recognized by virtually all of the delegates to the Convention, based on interviews and discussion with many participants. Most of the developing country delegates saw direct favorable linkages between the Law of the Sea Conference and the other important

international discussions on development that were taking place concurrently. As discussed in Chapter II of this dissertation, the evolution of the New International Economic Order, the UNCTAD discussions on a proposed Code of Conduct for Technology Transfer, the ongoing efforts to revise the Paris Convention for the Protection of Industrial Property, and the general North-South debate of the 1970s (and beyond) were all critical global issues during the 1973-1982 period of official Law of the Sea negotiations. Both developing and industrial country observers alike pointed out the importance of determining precedents in developing the legal technology transfer sub-regime.

Over the course of the Conference, there was a distinct increase in the level of debate (and politicization) over the question. As discussed at several points earlier in this dissertation, the initial discussions over technology transfer were confined to the relatively noncontroversial Third Committee. When a growing sentiment for mandatory transfer of mining technology became apparent, the discussions were shifted to

the First Committee. From that point on, the issue became increasingly contentious. By the time the Conference ended, the U.S. and most other Western non-signers were pointing to the technology transfer sub-regime as one of the major "hard spots" precluding their participation in the accord. The reasons given were both economic (value of the technology and resources) and political (precedents in other global fora).

The developing countries consistently pointed to the other global fora in supporting their negotiating position in the Law of the Sea, further demonstrating to the Western industrial states that the precedential links would be important if approved in the Treaty. This is supported textually by their comments throughout the Conference and by interviews and discussion. In addition to the precedential value of the technology transfer sub-regime, many of the developing countries expressed the view that there was a larger political value in the technology transfer provisions. If approved and accepted in the Treaty by the developed countries, they would act as a tacit acceptance of the underlying principles of the North-

South debate, as seen from the LDC standpoint. This is of larger importance to the developing world than the specific linkage benefits of the technology transfer sub-regime. Acceptance of the Treaty would give a major impetus to the entire logic of the argument from the LDC side, and this was considered to be of major political importance.

Overall, then, the political component of the technology transfer sub-regime is of extreme importance. Both from the standpoint of specific linkages to other political negotiating projects (UNCTAD Code, Paris Convention, etc.) and from the overall legitimacy it affords to developing world wealth and equity arguments, the technology transfer sub-regime is of concern to the developing countries. From the industrial country standpoint, it is equally important to control and shape the sub-regime (and the larger ocean regime) in a positive fashion. When combined with the economic incentives discussed above, it is clear that the technology transfer issue in the Law of the Sea discussions was a major issue, and continues to be one today.

Marine Technology Transfer and Policy Planning

The second major research question was concerned with the implications of marine technology transfer for policy planners. In answering this question, it is important to analyze and evaluate the basic positions of the four major actor-groups identified and examined in this study: the developing countries, the global organizations, the industrial countries, and the multi-nationals.

On the basis of the research presented in earlier sections of this dissertation, it is possible to briefly cover the views of the contending actors as follows:

1. The Multi-Nationals

- As a group, the multi-nationals involved in marine technology (and particularly those in deep seabed mining) are strongly opposed to any form of mandatory technology transfer.

- Major objections include: (There is some overlap between the categories, but each of the following objections covers some different aspect of the overall

problem.)

- o Destruction of the incentive to produce new technology. The Multi-national strategists and planners believe that if new marine technology is immediately made available to competitors via mandatory technology transfer (particularly competitors with the financial backing of an organization like the Enterprise), there will be little incentive to produce such technology.

- o Distortion of the free marketplace, not only in the selling and purchasing of the technology, but also in the area of any marine-related business. In a fast paced business sense, inherent distortions are involved in the mandatory passage of technology to potential competitors.

- o Ideological problems with the Treaty's approach to "private property". This returns to the philosophical problem of the "common heritage of mankind." The multi-nationals do not raise vocal objections to the broad principle; but they do draw a philosophical Rubicon where they feel "private property" (i.e. the marine technology) is involved. They will not agree that because

their technology is used to exploit the "common heritage" (the seabed) it therefore becomes part and parcel of the "common heritage" and loses its status as "private property."

- o The extent of the powers vested in the supra-national organization (the International Seabed Authority) to regulate international business and commerce in general and the technology in particular. These seem excessive to many Western corporations.

- o Lack of a concrete, limited definition of the "technology" that will be liable for transfer. The MNCs are afraid that it would be possible to extend the technology definition in the Treaty to cover a huge amount of equipment, technology, research, and proprietary information.

- o Costs for technology transfer will be carried by private international business under the Treaty. The MNCs argue that insofar as the concept of marine technology transfer is part of a global political and social effort at improving the quality of international life, the costs should be carried via the governments

concerned, not simply by their (the MNCs) stockholders.

2. The Developing Countries

The developing countries take both a pragmatic and a philosophical approach to the problem of marine technology transfer in the Law of the Sea context. From a philosophical standpoint, the LDCs are obviously strongly in favor of increasing the flow of technology, via mandatory controls if necessary, to their economies. This would lead to many political benefits as described in earlier sections. They (the LDCs) are also, again on mainly philosophical grounds, the strongest supporters of the "common heritage of mankind" premise. Their reasons are fairly straightforward: They see a world where much of the wealth, property, and prosperity have accrued to a relatively small number of nations. They perceive this as a gross inequality, and they seek to correct it via a political and negotiating process in the United Nations.

From a pragmatic standpoint, the LDCs probably do not need very much advanced marine technology at this point in

their development process, although this varies widely from country to country. They do need a framework that will allow them to develop precedents necessary under international law to establish a mechanism for technology transfer. The LDCs have tried unsuccessfully through the past decade to establish such precedents in other United Nations fora, as discussed earlier in this dissertation. The Law of the Sea Treaty seemed an excellent chance to firmly establish such a principle of mandatory technology transfer, since it allowed the opportunity to offer a quid pro quo to the industrial world (in the form of sub-regimes for straits, passages, territorial concessions, and other issues in return for the desired economic-technical deep seabed mining sub-regime). The primary organ for the vocalization of the developing world's views on this issue was the powerful Group of 77. Their basic platform can be summarized as follows:

- o The LDCs want more information from the multinationals who are running businesses both in the LDCs and in open areas of the world that fall into the category of the "common heritage."

- o A second major concern is the "unbundling" of package deals involving marine and other technology components dealt to the LDCs.

- o Developing countries also desire less restrictive clauses on marine technology once it has been transferred.

- o The LDCs are strongly in favor of mandatory transfer, with the LDCs promising to pay fair and reasonable prices, for technology directly involved in the exploitation of "the common heritage of mankind."

- o The developing countries also desire training for users in the technology once it is transferred.

- o The LDCs are quick to point out that they don't claim any right to technology that is used only in the industrial countries. They admit this is clearly "private property." Their concern is more directed toward technology that is used to exploit either their own countries or what is termed the "common heritage." They argue that since the technology is used in a global sense, then the returns should be shared with the global

community. They see mandatory technology transfer as the cornerstone of this program.

o While not a verbally articulated portion of the LDC package, it is important to note that there is a distinct undercurrent playing throughout the LDC demands for mandatory technology transfer. This is the perception on the part of the LDCs that since they were exploited as colonies, usually through the mechanism of advanced technology from the industrialized Western powers, they are "due" their share from the decades of exploitation that preceeded the de-colonization of recent years.

From the standpoint of objective analysis, there is much to recommend itself in the LDC arguments concerning the portions of technology that are used to exploit the "common heritage of mankind." The problem legally becomes one of establishing where private technology ends and exploitative technology begins. Much of the marine technology used to mine the deep seabed has applications to other forms of mining and marine work, which can be conducted in many other areas besides the deep seabed of the "common heritage." In other words, it is very possible

for technology to fall both into the category of "exploitative" and "private property." An example might clarify this concept. In the deep seabed mining system one critical element is the portion of the system that is used to bring the manganese nodules to the surface. The equipment used to do this is also used for a variety of other applications, including conventional land mining and marine work in the shallower exclusive economic zone/continental shelf region (within 200 miles of a nation's coast). Certainly, the concept of the deep seabed as the "common heritage" is becoming a consensus tenet of international law. This is a result of General Assembly resolutions, practice of nations in recognizing it, and the Treaty itself with its 121 signatures. It requires, however, a fairly large leap of faith to get from there to the concept that any technology used to exploit the "common heritage" itself becomes part of the heritage.

The broad question of mandatory technology transfer is a difficult one to swallow for many objective observers. More likely to gain acceptance is a sort of limited technology transfer, roughly along the lines of what is

proposed in the Law of the Sea Treaty, but with a clearer definition of what the specific "technology" would include, what "fair and reasonable price" will constitute in the case of unique, on-of-a-kind technology, and less pervasive control by the supra-national body set up by UNCLOS III. This will be addressed specifically in the final chapter, "Recommendations and Conclusions," of this dissertation.

3. Industrial Countries

The industrial countries are not very unified on the issue of mandatory technology transfer in the Law of the Sea context. They are likewise scattered in their programs approaching technology transfer broadly and the Sea Law Treaty generally. Unlike the fairly cohesive Group of 77 (at least on this issue), the industrial countries seem unable to direct their influence in a single, unified framework to resolve the situation. The key to implementing any solution that is likely to gain acceptance among the four contending power blocks studied here lies with the advanced Western industrialized countries. Even

within the individual countries, a change of government can have dramatic consequences, as indicated in the U.S. shift in position when the Carter administration left power and the Reagan administration entered. To a lesser degree, such shifts in administrations have affected the negotiating positions of Canada, England, and France during the course of the talks, as well as several other countries. The industrialized nations, which are generally democratic, are therefore under a wide range of influences in determining their policies on the marine technology transfer issue. The most important influence is probably the business interests, although this varies from state to state. The works of agencies, lobbying groups, environmentalists, lawyers, writers, journalists, and the public itself (insofar as it is even aware of the issue) are all important as well.

Broadly assessed, the position of the advanced industrial nations turns on the following considerations:

- o Philosophically, the Western powers by and large accept the general idea of technology transfer as a

"good thing." Some are even willing to accept the concept of mandatory technology transfer under very carefully defined circumstances, such as the the Law of the Sea context, if they can exercise strong control over the formation of the specific technology transfer sub-regime. It is difficult to say if they would be willing to then apply broader principles from the precedents set in such a document, although some observers believe that they will have little choice.

- o In particular, some of the "smaller industrialized nations" are prepared to accept the concept as part of a compromise, particularly as a quid pro quo for the LDCs' support on other issues. This was demonstrated by the compromise attempts by the G-11 in the final session of the Conference. Such countries as Australia, New Zealand, Canada, the Scandanavian nations, and smaller Western European powers would fall into this category.

- o It is probably fair to say that some in the industrialized nations believe that their countries have participated in exploitative practices in the developing world over the years, either as a state or through private

enterprises (or both). While probably still a minority view, some in the industrialized countries are willing to give some concessions based on a combination of international conscience and lingering guilt. Overall, this does not seem to extend very far or throughout all the industrialized countries.

o On the other hand, most of the industrialized countries are influenced to some degree by their powerful business lobbies, which as previously discussed, are solidly against mandatory technology transfer.

Overall, the industrialized nations are willing, for the most part, to allow some mandatory technology transfer. They are generally in favor of increasing technology transfer in order to fulfill a sense of obligation to the developing world and to help stimulate the world economy. They are in favor of some kind of statutory mandate in specific circumstances.

As should be clear from the foregoing, it is difficult to summarize the diverse opinions and stances of the Western industrialized powers. Their divisiveness was one

reason for their failure to control the outcome of the LOS Conference discussions on the issue of technology transfer.

4. The World Organizations

As they are by far the most tenuous of the four contending power "players," the world organizations are also the least influential. Their leadership, including such influential individuals as Tommy T.B. Koh, Alan Beesley, as well as Hamilton Amerasinghe and Bernardo Zuleta (prior to their deaths), were basically neutral throughout the negotiating process. Overall, however, it is fair to say that the direction of most U.N. agencies is pro-mandatory transfer. The world organizations have worked to provide a suitable fora for the establishment of a new global system of technology transfer, as embodied in efforts to fashion a new Code of Conduct, revise the Paris convention, and most recently, in a mandatory technology transfer system in the Sea Law Treaty. The leadership has been conciliatory toward the Western powers, while trying to steer the global consensus toward a pro-transfer

situation. The basic position of the world organizations is as follows:

- o Continue to provide the fora for the exchange of ideas among the various groups.
- o Work for a global position on the issue, in order to further basic principles of cooperation, interdependence, and peace.
- o Stimulate the global economy by encouraging new marine technological ventures in the LDCs, all forms of production and mining commensurate with conservation, and further business ties throughout the world.
- o Ensure the continuation of ecological protection where required in projects involving marine technology.
- o Maintain peaceable and amicable relations between the industrial powers and the LDCs via "North-South" summits and projects. The cooperative transfer of marine technology is viewed as a means toward this end.
- o Gradually move toward a more equitable distribution of wealth through the implementation of such

principles as the "common heritage of mankind." Again, marine technology is viewed as a tool to apply in linkage negotiating situations.

- o Ensure an acceptable Sea Law Treaty is passed, with agreed upon technology transfer principles, to promote all the other objectives above.

Evaluation of Actor Positions

This section of the chapter will analyze the positions of the aforementioned actors, extracting the most broadly acceptable portions of the positions of each of the participants. Evaluation and analysis will be undertaken at the same time. The objective will be to arrive at a set of considerations that can be synthesized into a coherent set of recommendations concerning the issue of marine technology transfer in the Law of the Sea context. The exercise is not to be considered normative---positions are neither inherently "good" nor "bad." The idea is that some of the positions can command broader support across the range of actors than others.

Multi-National Corporations

The most cogent argument presented by the multinational corporations seems to be that if there is a wholesale mandatory transfer of marine technology, much of the market incentive to produce that new, unique technology will disappear. This is particularly true in the case of industries involved in such high-technology ventures as deep seabed mining, artificial island construction, high-yield fishing, and other advanced marine technologies. As F.M. Scherer, a leading industrial economist, describes the¹ concept of patent systems:

"Stimulating the invention and development of new products and processes is without doubt the most important benefit expected of the patent system. For it, society pays a price: the monopoly power conferred by patent grants. In simplest terms, the overriding issue of patent policy is whether the benefits of the system outweigh the costs. Or, on a more sophisticated plane, the problem is to design a system---e.g. by adjusting the length or

¹F.M. Scherer, Industrial Market Structure and Economic Performance (Boston: Houghton Mifflin, Co., 1980), p. 442.

strength of patent grants---that will yield the maximum surplus of benefits over cost."

In the case of international access to marine technology, the long term costs to the global society (loss of incentive to invent, tendency to hoard technology, less industrial development of technology) seem to outweigh the benefits (development of LDC economies, transfer as a principle), in my view. It is difficult to agree with this argument in toto, however, if one happens to be involved in a developing country economy. In general, the difference in opinion is to be expected. In a less developed economy, "one might expect the benefits of a patent system to be particularly small relative to the social costs of granting² foreigners patent protection." In other words, the LDCs naturally (in economic terms) are less inclined toward the use of the patent systems, since they must import almost all of their technology anyway. This leads to the conclusion that one means of overcoming the long-term conflict between the LDCs and the Industrial countries is to encourage the development of internal R&D on the part of the LDCs. Admittedly, this is a long term solution. It

²Ibid., p. 450.

would certainly require advanced education "credits" in the industrial country's educational systems. This will be explored as part of the proposed package of recommendations in the next chapter.

Another key to solving the patent protection argument might be to design a patent system that is specific about the length of each patent in the marine technologies covered by the Treaty. Scherer describes the ideal patent system as one which, "would hand tailor the life of each patent to the peculiar circumstances of the invention it covers."³ This seems feasible when dealing with a very limited selection of technologies, which could be the case with the marine technology covered by the Sea Law Treaty. This concept will also be explored in the next chapter.

The remaining arguments of the multi-national corporations against mandated technology transfer in the Sea Law context are less convincing. For example, the MNCs contend that the Treaty somehow "violates the tenets of private property." Several corporate executives believe that the mandatory technology transfer provisions of the Treaty are written in such a way as to "legalize the theft"

³Ibid., p. 449.

of corporate property, i.e. technology. This simply cannot be supported from the Treaty text. There is considerable protection built into the document to ensure payment is undertaken and the rights of owners are exercised. While there are legitimate concerns as to the degree of payment for proprietary technology, there is no stated textual material that even implies that the technology somehow passes into the public domain. A second major stated concern of many MNC executives is the level of power vested in the Seabed Authority. Again, this seems to be rhetorical and overblown. The ISA will ultimately have considerably less than complete control over the Seabed, and the checks and balances built into the system by the various councils, the Assembly, and the U.N itself will give the MNCs several directions of appeal. Overall, the power of the ISA is considerably less than that exercised by sovereign states in which the MNCs are currently operating.

Two complaints that have some substance (but are certainly solvable) are that there is currently no concrete definition of precisely what technology will be covered and

that costs will be born largely by the MNCs and their stockholders. The first objection could be overcome by writing a more precise definition of marine technology that is liable for transfer. This will be discussed in the Recommendations section of the next chapter, and could be a useful improvement in the Treaty text. The second objection, that excessive costs in the transfer process are born by the MNCs and their stockholders, could be addressed by ensuring an equitable patent system is utilized in connection with the Sea Law Treaty, as will be described below. The risks could further be reduced by ensuring that the governments concerned (both industrial and LDC) share in a portion of the costs. It is possible to envision a variety of schemes to transfer some of the costs to the governments (i.e. the taxpayers) via the use of tax credits, subsidies, grants, and so on. Finally on this point, it should be born in mind that the nature of business is the carrying of costs and risks, presumably undertaken for the possibility of reaping profits. In this sense, the MNCs are merely conducting normal business with attendant risks not dissimilar to those faced in other

investment opportunities.

Developing Countries

In the case of the LDCs, the strongest argument they make on their side of the issue is the primary philosophical one. It is difficult to refute the concept that the natural resources of the world are the "common heritage of mankind," at least where they occur in unclaimed portions of the globe, such as the deep seabed. While the world has not always been kind to philosophical arguments for equity, justice, and idealistic sharing, the fundamental attractiveness and forcefulness of the "common heritage" argument is obvious. The difficulty with the argument begins when it is applied to wealth that is not so clearly "common" (such as the deep seabed) but rather is essentially "private" (such as proprietary technology). The LDC contention is that if there is to be an equitable distribution of the wealth of the common heritage, then the Enterprise and the LDCs themselves must have an opportunity

to obtain some of the wealth. To do this, they will require the technology that allows such exploitation. Such technology, however, is usually someone's private property. This, of course, is the crux of the most difficult, emotional segment of the entire issue of mandatory marine technology transfer. A possible solution, which will be developed below, would be to accept the basic validity of the "common heritage" principle, and to develop means of ensuring a flow of technology and an opportunity to exploit the common heritage, without having absolutely mandatory technology transfer. Unfortunately, this is a difficult compromise to envision, although several positive policy recommendations will be presented in the following chapter to attempt and address the issues specifically. One area to concentrate upon is the concept of "fair and reasonable" pricing for the technology. If an acceptable measure can be determined for the technology, it might be possible to gain multi-national/industrial country cooperation in the transfer. Again, this will be outlined in the recommendations section below.

One LDC complaint is that they receive little in the

way of information from the corporations exploiting natural resources as to their plans and operations, as well as their technology. In this area, the LDCs will probably have to give some compromises. Simply participating in development of the "common heritage" of the deep seabed does not mean that a corporation should be forced to open its plans, tactics, strategy, and business operations to either the ISA or competing LDC consortium, as has been implied by some convention delegates.

Most of the other "bargaining points" presented by the LDCs in the course of the negotiations are fairly reasonable. The concepts of better training for users, less restrictive clauses on marine technology after transfer (allowing generalized utilization by new users), and "unbundling" of sales to the developing world are all intelligent and generally acceptable.

Finally, the issue of technology transfer as a sort of "return payment" for the sins of colonialization holds little analytic value. In both a pragmatic and philosophical sense, it is difficult to justify the idea of Western "guilt" as having an operative effect on the entire

issue.

Industrial Countries

One point of the industrial country's arguments is their concern over the security implications of technology transfer. Many of the Western governments, particularly the U.S., are very worried about the security implications of marine technology transfer. The passage of technology through Third World proxies to Soviet Block countries poses⁴ a problem for Western planners. The Treaty answers this concern to some degree by specifically excusing from mandatory technology transfer any technology that is⁵ security sensitive. Some critics have observed, however, that this could easily be challenged in arbitration or via the Tribunal constituted by the Treaty. Additionally, the penalties for espionage by members of the International Seabed Authority or its organs (such as the Enterprise) are minimal. The concerns of the industrial countries lie deeper than simple security technology. Most

⁴James Tice, "Senate Panel Report on Soviet Efforts," Navy Times, October 7, 1983, p. 20.

⁵LOS, Article 302, p. 148.

have a fundamental philosophical problem with sharing technology of any kind with the Soviet Bloc without tight controls. Under conservative U.S. administrations, for example, such technology has traditionally been a means of disciplining the Soviet bloc countries, albeit with little success. One solution here would be tighter controls over the security sensitive technologies and more stringent penalties for misconduct by Authority employees. Many of the industrial complaints in this area seem somewhat unfounded anyway, given the huge amount of technology that is transferred to Soviet and developing countries via the open Western educational system, public sources, and outright sales by Western corporations and technology brokers. While it is perhaps unfair to dismiss Western concerns over the issue out of hand, it is probable that there are reasonable grounds, for compromise. Incidentally, this is one area of the Treaty and the technology transfer issue where linkages could be established that might improve U.S.-Soviet relations.

Most of the Western industrialized countries would like to see technology transfer as part of a larger, global

effort oriented toward joint ventures in the developing world. The success of such efforts in many of the so-called "Newly Industrialized States (NICs)", such as South Korea, Singapore, Hong Kong, and so on seem attractive to many in the West. The means to encourage private sector activity in the industrial countries toward this end is a matter of government policy. Tax incentives, import benefits, dropping of protectionist measures, and opening Western markets to higher levels of LDC goods, and other options are all available to enable the industrial countries to accept some of the cost of the technology transfer. The benefit for the industrial countries lies in the profits to be made from such joint venture projects, the political gains in the LDCs, the stimulation of the global economy, and the associated benefits of expansion of the basic production possibilities frontier. This overall stance is probably indicative of both the major and minor industrial powers.

Certainly the most significant aspect of industrial country policy on the issue was the impact of the business lobbies in the democratic states. Particularly in the

United States, the leading Western actor, the business groups were able to exert considerable influence in the executive branch of the Reagan White House. Analytically, the issue for the industrial states is the balancing of the influence of internal and external business considerations versus the political and strategic value of the Convention, which is considerable. Taking the U.S. as the lead actor, it is obvious that the current administration decided on the overriding value of the economic issues at the expense of the political and strategic capital that could have been gained by accepting the Convention. In my view, this was a mistake for the U.S. in particular and the Western states in general that are following the U.S. lead. The Convention, while not without its problems, is far from fatally flawed. The U.S. and other Western states would probably be able to use their still considerable influence within the context of the Treaty to direct the new regime in acceptable directions. The "go it alone" approach of the Reagan administration and other Western hold-outs will be detrimental to the longer-range political and strategic interests of those states.

The original vote on the Treaty demonstrated the following variance in industrial country positions:

<u>IN FAVOR</u>	<u>ABSTAINING</u>	<u>AGAINST</u>
Australia	Belgium	United States
Austria	West Germany	
Canada	Italy	
Denmark	Luxembourg	
Finland	Netherlands	
France	Spain	
Greece	United Kingdom	
Iceland		
Japan		
New Zealand		
Norway		
Portugal		
Sweden		
Switzerland		

Source: United Nations Chronicle, June, 1982

The political isolation of the United States is obvious in the distribution of the vote. Since the vote, none of the industrial states have ratified the Treaty, although none of the countries voting in favor have indicated that they have changed their original view toward the document.

At this point in time, it seems clear that there will continue to be a division between the U.S. and at least some of its allies over the issue of the Law of the Sea Treaty.

In evaluating the overall Western positions, the U.S. and other "hold outs" are likely to be placed in an increasingly untenable position as the Treaty gains force. The approach taken by France and Japan, as well as other Western signators such as Canada, Australia, New Zealand, and the Scandanavian countries, is the more realistic.

The World Organizations

From the standpoint of the world organizations, particularly the U.N. group, the key will be getting discussion started between the Western Treaty holdouts and the Treaty signators. They should remain concerned primarily with providing the proper fora for future discussions, if possible, as well as encouraging compromise and providing leadership where necessary. The organizations must ensure that they continue to be relevant players undertaking an unbiased role in the negotiating process. The leadership was able to remain fairly even-handed throughout the Conference, only fully suporting LDC positions during the Eleventh Session. Naturally, some bitterness can be expected among the disappointed

leadership over the rejection of the Treaty by some leading Western powers. Much of this natural resentment has been overcome with the passage of time since the tumultuous Eleventh and final session, and it seems as though the time is drawing near when the U.N. leadership (particularly such moderates as Koh, Beesley, and others) could sponsor further talks on the subject. It is clear that the proper path for further discussion and the eventual resolution of differences of technology transfer and the Law of the Sea Treaty remains the U.N. arena, despite much recent adverse publicity in the U.S. and other Western countries.

Overall, the significant role of the world organizations is one of the stabilizing factors in what is otherwise a difficult and chaotic process of negotiation. The utilization of the world organizations fora will be one of the basic premises of the recommendations discussed in the next chapter.

Policy Planning and Marine Technology Transfer

Policy planning is the art and science of determining the overall direction of an organization (a country, corporation, or international organization). The planner is responsible for charting the broad course of action undertaken by an organization. The planner is also generally directed to attempt to predict the impact of issues, events, objectives, and other internal and external factors. In this regard, policy planning takes into account not only specific policy, but also the pertinent strategy and tactics necessary to achieve organizational goals.

The question for planners in the Marine Technology Transfer and the Law of the Sea issue is one of importance. As demonstrated in the foregoing sections of this chapter, the issue has major political and economic ramifications for all parties to the Treaty, including the developing countries, the industrial nations, the multi-nationals, and the international organizations. It is not an issue that will simply "go away," any more than the entire North-South dialogue or the global dispute over the distribution of wealth will simply go away. Rather than simply restate the

findings of the paper, it is sufficient to point to the issues raised in the preceeding section. Each applies directly to the policy planners in the given organizations.

Planners are faced with a very real dilemma in this issue-area. The current Treaty will not emerge as a viable regime until it receives a greater measure of support from certain key maritime players, notably the United States. The issue for the developing countries is how to involve these players in the regime. For the industrial countries, both the signators and the hold-outs, the issue is one of shaping the regime, which will be a requirement for successful ocean exploitation, to say nothing of global harmony. The multi-nationals and the world organizations both have vested interests that have been outlined above. The situation is currently at a stalemate.

In the final chapter, the issue of recommendations for specific policy actions will be addressed, in hope of moving the situation from the planner's desks to a true resolution. Final conclusions concerning the issue will also be drawn.

VII. Recommendations and Conclusions

In this final chapter, a specific set of policy prescriptions will be offered in order to answer the third research question, "How should the marine technology transfer sub-regime be changed in order to induce full participation?" Final conclusions, drawn from the evaluation and analysis presented in the preceeding chapter will also be offered.

The need for an answer to the question mentioned above stems directly from the current impasse over the overall Treaty and the specific provisions dealing with marine technology transfer. As discussed in the preceeding chapters, it is in the overall interests of the world community to develop and accept a comprehensive ocean regime in the form of a Sea Law Treaty. At this moment, there is little liklihood that the Law of the Sea Treaty will be accepted by several of the key maritime and Western

industrial states, including the United States, the United Kingdom, West Germany, Italy, and Belgium, among others. There is even consideration being given to an alternative, competitive Treaty among the Western "hold outs."¹ In this chapter, specific recommendations in the form of policy prescriptions will be offered on the following seven general topics:

1. Establishment of a new process and a suitable forum for further discussion.
2. Development of a marine patent system to protect owners of marine technology.
3. Creation of an effective and comprehensive technology assessment system to survey current and future marine technology.
4. Establishment of an independent technology arbitration board.
5. Use of Western educational systems to further the goals of marine technology transfer.
6. Introduction of regional research and development centers to further enhance the effect of marine technology

¹Anthony D'Amato, "An Alternative to the LOS Treaty," AJIL, April, 1983, pp. 4-6.

transfer and allow the development of further technology in the developing world.

7. Creation of incentives to underscore the importance of joint ventures and equitable profit sharing in future marine planning.

Additionally, an attempt will be made to predict possible outcomes for the marine technology transfer sub-regime. The policy prescriptions offered in this chapter will be integrated into the posited scenarios, with an emphasis on providing suitable options to planners.

Finally, overall conclusions will be offered.

It should be noted at the outset of this final chapter that it is recognized that many of the recommendations will not be universally welcomed. Such is the fate of proposed solutions to controversial problems. The objective of these recommendations is merely to offer an alternative to the present situation, which is in virtual stalemate. Clearly, the concept of a universally accepted Sea Law Treaty is in the interests of the global community as it strives to move toward a negotiated, equitable, and

efficient world order. As matters stand today, the Treaty's provisions on marine technology transfer will remain a major stumbling block to the U.S. and other Western powers for an indefinite period. Even if a huge majority of states eventually ratify and bring the Treaty into force, it is unlikely that the "hold out" states will accept the Treaty's norms as binding international law. The task at hand for the global community is to bring the Treaty into force with support from all major actors. A Sea Law Treaty without the unqualified support of the U.S., remains, despite all protest to the contrary, a somewhat hollow accord. While the process of reopening negotiation is a nightmare to many diplomats and planners who struggled through the previous ten years of discussion, it may be the only way to eventually arrive at a legitimate and universally acceptable accord. All of this will be discussed below. The ideas mentioned here as recommendations should serve only as a starting point which might assist in the process of furthering discussion and thought on this vital subject.

Forum Selection

The first conceptual question in setting out a proposed solution to the issue is selection of a suitable forum for continued discussion. The question here is whether or not the international organization (essentially the U.N. group) is the best vehicle for exploring the issue. All evidence indicates that it is. Although much maligned by some critics as a rhetorical outpost far removed from the reality of global politics, the world organization will gradually strengthen over the long throw of history. The institutional forum offered by the United Nations group, while not without its drawbacks (which include its overly politicized atmosphere and rhetoric, as well as a somewhat unwieldy decision-making and drafting process), is a good basic starting point for reopening discussion on the issue of marine technology transfer. The current version of the Law of the Sea Treaty is probably the best draft to begin with, since it represents an accord with acknowledged support from many quarters. The Treaty further allows the developing countries to offer a quid pro

quo to the industrial countries in the form of strategic and political questions, both inside and outside the LOS regime itself. It does provide a public arena for the discussions, as opposed to bilateral or smaller multilateral talks. The final outcome of the negotiations will be widely publicized, more indicative of general international norms, and inherently stronger for having been accepted by a wide range of countries. The organizational forum allows relatively quick acceptance as an international norm via the signing and ratification process in the home countries of the signators. Further, the Law of the Sea umbrella seems an appropriate place to reopen and attempt to conclude the issue of marine technology transfer, and will promote better ultimate global relations as part of a general agreement. Finally, the organization can provide the closest thing to "neutral turf" where the contending sides can thrash out the issues involved.

Some observers are already calling for what would be in effect an "UNCLOS IV." There is certainly a ready and waiting pool of trained diplomats and negotiators familiar

with the issue. The largest question is whether or not the countries concerned would be willing to reopen the entire Convention to discussion in order to satisfy the objections of a handful of Western states. My research and study of the problem leads me to believe that a new Convention might be the ultimate outcome of the current impasse. I think this is possible for several reasons.

First, until the U.S. signs the Convention, the accord will be somewhat hollow. Moderate states, both industrial and developing, desire U.S. participation in the Treaty in order to lend more weight to the actions and decisions of the body. Second, the U.S. will ultimately find it very difficult to "go it alone" outside the Treaty, since Treaty signators may deny the U.S. transit rights and other privileges of the Treaty. The cost to the U.S. in political and economic terms will probably eventually produce considerable pressure to sign the Treaty. This will become particularly important as the time for actual mining beyond the continental shelf/exclusive economic zone arrives. In order to obtain the regime it wants, the U.S. will eventually support a call for a new

Convention. Additionally, international organizations of which the U.S. is a member, notably the U.N. group, will continue pressure for either signature/ratification (which will not be forthcoming as the Treaty is currently written) or a new round of negotiations. There is certainly a trained staff of international bureaucrats ready, willing, and able to undertake new talks in the not disagreeable atmosphere of New York, Geneva, and perhaps now Jamaica. Finally, it is a well known fact that regimes change. As discussed in the opening chapter of this dissertation, a variety of factors can cause this change, including internal and external changes in power, technology, and leadership. It seems that changing global situations will necessitate further talks, particularly with the situation currently in a sort of limbo.

The possibility of renegotiating only the deep seabed mining portions of the Treaty would be a real alternative, and the mandatory technology transfer provisions could easily be addressed in a new mining-only treaty process. This would have the advantage of delivering a complete ocean regime, sans mining, almost immediately. The

difficulty with this solution, of course, is the "package deal" mentality of most negotiators. The developing countries view the deep seabed mining and the marine technology transfer provisions as their quid for the quo delivered with the strategic transit portions of the Treaty. As discussed earlier, this was the overall linkage strategy that was so much a part of UNCLOS III. It is unlikely that many LDCs would be willing to renegotiate the mining provisions while continuing to allow the liberal strategic passage portions of the document. In formal regime-analysis terms, the problem is that a limited, mining-only process would mean a drastically reduced possibility for compromise via linkage strategy, which could make agreement impossible. The passage of time and the growth or failure of the current version of UNCLOS III will be the determining factor here. In other words, if the new ocean regime is not accepted or followed as a result of the action of the "hold outs", it is conceivable that the LDCs would eventually be willing to accept a renegotiation of the mining portions, which would go far toward addressing any Western problems with the document.

Overall, though, the point here is that the United Nations forum is the best location for negotiation of the ocean regime and the marine technology transfer sub-regime.

A Marine Patent System

Probably the greatest single stumbling block to a resolution of the problems generated by marine technology transfer in the Law of the Sea context is the question of patent protection for the industrial corporations that will be giving up the technology. Their argument that a loss of technology, reduced incentive to produce, and less general innnovation will result are valid complaints. Their concerns are not of major weight to the LDCs, who have a virtually non-existent technology base producing active research and development today. The resolution to this portion of the conflict seems to be twofold: A better designed patent protection system for the holders of the technology; and, as a quid pro quo for the stronger patent system, (which will of course reduce the amount or raise the cost of marine technology flowing to the LDCs, at least

on an ownership-basis), better access to the educational systems of the Western industrial powers and the development of regional research and development centers for marine technology, with some Western support and funding. These three recommendations (marine patent system, use of Western educational systems, and regional research and development centers) will be examined below.

Patent Reform at Sea

The key to this recommendation is that it must be instituted specifically in the area of marine technology that would be transferred under the Law of the Sea Treaty. This entails a much more precise definition of technology than is currently offered in the Treaty. Such a definition could be drafted and written into an Annex to the accord, and it should be a multi-page, precise document, with means for revision, that specifically details the applicable technology. Additionally, the Treaty must clearly specify that mandatory technology transfer as practiced in the Law of the Sea context is not a precedent-setting process for

other fora. For example, the Sea Law Treaty must not provide a basis for larger accords, such as the UNCTAD Code of Conduct on Technology Transfer or the Paris Code Revision talks. Such larger concerns of technology transfer must be negotiated in their own appropriate fora. If changes occur in the general way of doing business with technology transfer, these could later be incorporated into the Convention. If the new proposals in the Sea Law talks are limited to specific marine technologies, some areas of patent protection might then become acceptable to all parties to the Treaty.

The first concept would be to allow patent protection for some portion of the life of a new marine technology. This could be a fairly short period, something less than the periods allowed in most industrial countries, but longer than the non-existent patent protection that would be allowed under the Sea Law Treaty. A period around 3-5 years might be acceptable both to the multi-nationals and the industrial countries, and to the LDCs. The 3-5 year period suggests itself because a "normal" period for patent protection in many Western (and developing) states is

roughly 7-10 years. Thus, 3-5 years would be a concession on the part of the Western holders of technology, but would still provide some protection as compared to the current Treaty. The exact length of time could be "hand tailored,"² as described by F.M. Scherer, to the specific technology. An option to renew the patent could be allowed for up to 7-10 years (a "normal" period of patent protection under most systems), with the patent owners paying an additional fee for the right to continue the patent for extra years. The taxes raised could be applied to a fund that would be used to sponsor educational benefits for LDC students in Western institutions. Such funds might also be applied to the development of regional research and development centers that could one day lead to technology independence for the developing world. In effect, this is a linkage strategy with benefits for both sides. Such a system is already in place in West Germany, for example, in the area of sensitive industrial technology, where patents are more or less "hand tailored" based on a wide variety of factors.³

Again, it should be emphasized that such a solution could be applied only to a limited segment (just marine

²F.M. Scherer, pp. 455-457.

³Ibid., p. 455.

technology used in exploiting the "common heritage") of the total question of technology transfer. It would have to be ruled upon by some appointed board, perhaps the arbitration regime for the Law of the Sea, currently envisioned as being held in Hamburg, West Germany.⁴ The composition of the council would have to be modified to include legitimate representatives from various business interests, industrial countries, and the LDCs in some to-be-determined measure. The use of professional economic advice would be necessary to ensure that proper judgements in the long and short term interest were being handed down. A more attractive idea, which will be discussed in more depth below, would be to constitute a technology assessment board and a technology arbitration group, with specific charters for dealing with marine technology transfer.

Technology Assessment and Arbitration

A second major problem with the technology provisions of the Treaty is the problem of determining payment. The Treaty calls for "fair and reasonable" payment and

⁴"Leadership Sees Completion of LOS Treaty," Diplomatic World Bulletin, Volume 12, Number 4, March 1-8, 1982, p. 9.

"commercial" payment at various points for the technology that is transferred under the mandatory provisions. The question, however, becomes one of determining "fair market value." It is difficult, if not impossible to assess a fair market value on a technology that is unique and represents the opportunity to earn its inventor large monopoly rents. Simply by sharing it with competitors, the fair market value is immediately reduced considerably. Naturally, the holders of unique technology have been consistently concerned about the value of their investments in the face of such a scheme. Additionally, the value will be set by the International Seabed Authority, which would seem to indicate a further slant in favor of its own organ, the Enterprise.

The answer to this concern is technology assessment. This is a relatively new concept, particularly when associated with the oceans. In its broadest definition, it is "intended to provide decision makers with useful information about the potential consequences of actions and decisions relating to technological developments." It is further designed to "identify the possible impacts of

⁵Vary T. Coates, "Technology Assessment," Marine Technology Assessment (New York: Westview Press, 1975), p. 33.

technology," as well as the costs and benefits of all processes related to the technology.

The United Nations has already done some work in the field of technology assessment, although more in ecological impact than in what in effect is sociological and economic impact areas.⁶ The concept could be applied to the various marine technologies that are affected by the LOS Treaty. Since the technologies are essentially divided in the world by levels of GNP, the representation on a proposed Technology Assessment Board for the Oceans (TABO) could include the leading technological states, the developing countries, respected scientists, economists, and businessmen. The TABO could be empowered to make decisions on the following:

1. What is the proper, specific definition for technology in the Law of the Sea context?
2. What specific technologies are in the category of mandatory transfer and which are recommended transfer?
3. What are the most sensitive commercial and security marine technologies?
4. What technologies should be exempted from any form

⁶ Klaus-Heinrich Standke, "The U.N. and Technology Assessment," Marine Technology Assessment (New York: Westview Press, 1975), pp. 22-23.

of mandatory technology due to their unique character or security considerations?

5. For what length of time should a specific new marine technology receive patent protection (3-5 years) before it would become liable for transfer?

6. What is the value of various technologies taking into account market value of hardware, potential as innovations, and resource impact?

7. What technologies should be transferred on the basis of their applicability to the "common heritage?"

As a general guideline, the Convention would be a starting point, but the TABO would be able to take into account the full range of factors that are important in assessing the technologies. As broad categories the technology could be grouped as follows:

Category I: Mandatory Transfer at Determined Price--

Technologies that are specifically for the exploitation of the deep seabed, including underwater systems and mining equipment. Not to include general support technologies, such as ship, processing,

exploration, artificial island construction, and so on.

Category II: Recommended Transfer at Determined Price--

Generic technologies that apply to the rest of the general process of ocean exploitation, including mining, fishing, hydrocarbon exploration and processing, artificial structure construction, anti-pollution, ocean energy, etc.

Category III: Protected

Truly unique, proprietary technology that would be protected under a special Marine Patent System (MPS) that would be administered by the TABO. Naturally, the assignment of equipment and systems to these categories would be somewhat arbitrary. It is difficult to draw a line between what is a "truly unique proprietary technology," and one that merely represents a basic refinement of an already-invented system. Without delving too deeply into the process of patent-granting here, suffice it to say that there are professionals in virtually every country that work daily at making such distinctions in granting patents. Their expertise, combined with lawyers, engineers, marine scientists, and other experts

should make such determinations possible.

Sub-categories could be established, and appeals could be heard by a second internationally constituted body, the Technology Arbitration Council for the Oceans (TACO). The TACO would be a parallel body to the TABO, but with an emphasis on negotiators, lawyers, development economists, and sociologists among its membership. Like the TABO, it would include representatives from developing and industrial countries. It would be empowered to rule on appeals by the ISA, developing countries, industrial countries, or MNCs concerning the decisions and administration of the Marine Patent System.

The TABO and its MPS would have to be independently constituted and organized bodies, with costs underwritten either by subscription, profits from marine exploitation, or donation from MNCs and governments. As internationally constituted bodies, they would require status equivalent to the ISA. The same would be true of the TACO. Such organizations would not need to be elaborate or expensive, as the number of cases and decisions would be expected to be fairly small, once the system is set in motion. After

all, less than 20 mining stations would be required to conduct most of the deep seabed mining envisioned for the next century. As man turns increasingly to the Oceans, such organizations could provide the rudimentary beginnings of further, more complex ocean management groups. The TABO and TACO could be located in a major academic or research center (Woods Hole, Cambridge, San Diego (Scripps Institute), Oxford, Tokyo) where its capabilities could be enhanced by the local institutions. Additionally, its focus would be specialized in marine technology, allowing it to function relatively apolitically.

Using Western Educational Institutions

Technology, without the trained personnel to understand and exploit it, is useless equipment. This has been a consistent factor in many failures to inject advanced technology in developing economies. The attention in the Treaty definition of technology (to include training and management) is a reflection of this desire on the part of the LDCs to gain a more fundamental handle on the

technology they receive. The real key to effective marine technology transfer is to more fully open Western educational institutions to LDC personnel and allow them access to the information that forms the underlying methodology of the technology. This is already in place to some degree today, of course, particularly in the United States. In the U.S., colleges and universities have a long tradition of accepting foreign students, and a growing percentage come from developing countries. This tendency should increase in the 1980s and 1990s as the demographics of the U.S. and Western population dictates a lower college age group in the West. According to the 1981-1982 Fact Book for Academic Administrators, U.S. student population will dip by at least 10% by 1988.⁷ This "slack" in the system could easily be absorbed by foreign students, many from LDCs. As an example of current foreign student populations in some representative U.S. colleges and universities,⁸ the following are noted:

⁷ Charles J. Andersen, Fact Book for Academics (Washington, DC: American Council on Education, 1981), p. 57.

⁸ W. Todd Furniss, ed., American Universities and Colleges, (Washington, DC: American Council on Education, 1980), p. 25.

University/College	Total Student (U/G)	%Foreign
MIT	4,000	6%
Harvard	8,000	6%
Georgia Tech	10,000	1%
CAL Berkley	21,000	2%
Northeastern	20,000	5%
Georgetown	5,000	6%
UCLA	8,000	5%
U Michigan	10,000	7%
U Chicago	2,000	1%
U Maryland	25,000	2%
Johns Hopkins	3,000	3%
Boston U	20,000	6%
Syracuse	12,000	4%
RIT	8,000	2%
UTEP	10,000	9%
TEXAS A&M	30,000	3%

Clearly, there are already large numbers of foreign students studying in the United States. Some schools have as many as 17% foreign students, with large percentages of students coming from LDCs such as India, China, Thailand, Korea, the Philippines, Mexico, the Arab countries, Iran, and Pakistan.⁹ There are currently in excess of 175,000 foreign students enrolled in the U.S.. This sort of exchange is the ultimate form of technology transfer. It is in this area that excess profits can usefully be applied from deep seabed mining and other marine ventures into the common heritage. Rather than providing large sums to

⁹W. Todd Furniss, p. 26.

the cumbersome and somewhat unwieldy International Seabed Authority, (as some in the industrial world have criticized it), it seems more efficient to give such funds to scholarship funds for LDC study in the West. The true "common heritage" of mankind is knowledge, and this can be equitably shared at a very low cost to most countries. In this regard, much of the cost of technology transfer can be shifted to the government sector by the use of scholarships, grants, subsidies, and other means of encouraging the studies of LDC students in the advanced educational systems of the world. This would serve not only the higher interests of transferring technology, bringing the global community closer together, and serving to enlighten generations of students in the other's cultures; it would also be a source of political capital for the industrial countries that provided the funds for the LDC students. Such a fund could be supported by profits from the Enterprise, subscription funds currently earmarked for the ISA, and taxation on the deep seabed mining concerns. The funds could be disbursed to students or to professors to take sabbaticals and go teach in the

developing world's universities and colleges. The benefits to both sides in the technology transfer issue are clear.

One sidelight to this process is the necessity of educating a corps of individuals in the LDCs in the rudiments of patent economics, the structure of technology transfer, and in the legal and political mechanisms necessary to ensure the transfer is ultimately a useful and rational one. A series of scholarships could ensure that the LDCs would have the expertise needed in this small but vital area. This has been outlined and supported by the Licensing Executive's Society, the major Western
¹⁰
 association of patent and technology lawyers.

11

Regional Centers for Research and Development

Obviously, the proposal to use the Western educational systems represents only a sort of "first step" toward the overall objective of resolving the LOS Treaty conflict. At the root of the disagreement over marine technology transfer in the LOS context is the fact that the West currently has all the technology, expertise, and

¹⁰Homer Blair, Interview, March 1982.

¹¹Many of the concepts in this section were suggested by Professor Robert Meagher of The Fletcher School.

educational systems, while the developing world has almost none. Over the longer term (20-50 years) this situation could be improved, thus removing one source of conflict in the ocean regime. The "second step," which could initiate great changes, could well be the creation of regional and/or national centers for marine research and development. Such centers could eventually provide the developing countries with their own, organic source of marine technology. It seems possible to use the LOS Treaty as a sort of vehicle for assisting in this process.

There are currently provisions in the Treaty to establish such centers. They are, in fact, currently proposed in the sections of the Treaty dealing with "encouraged" technology transfer, i.e. Part XIV, Development and Transfer of Marine Technology. Within Part XIV, Section 3, "National and Regional Marine Scientific and Technological Centres" there is a discussion of such a concept. As currently envisioned, such centers¹² would have the following functions:

"(a) training and educational programmes at all levels on various aspects of marine scientific and technological research, particularly marine biology, including conservation and management of living resources,

¹²LOS, Part XIV, pp. 134-138.

oceanography, hydrography, engineering, geological exploration of the seabed, mining, and desalination technologies;

(b) management studies;

(c) study programmes related to the protection and preservation of the marine environment and the prevention, reduction, and control of pollution;

(d) organization of regional conferences, seminars, and symposia;

(e) acquisition and processing of marine scientific and technological data and information;

(f) prompt dissemination of results of marine scientific and technological research in readily available publications;

(g) publicizing national policies with regard to the transfer of marine technology and systematic comparative study of those policies;

(h) compilation and systematization of information on the marketing of technology and on contracts and other arrangements concerning patents;

(i) technical co-operation with other States of the region."

Clearly, such centers will have a "full plate" indeed. There is, however, nothing in the Treaty that provides any true direction or funding for the centers. States are merely encouraged to promote the development of such national and regional centers. There is no specific delegation of responsibility for leadership and/or funding in such a project, other than a few vague references to the Authority. It seems that the establishment of such centers might be a useful tool to use in linkage strategy to help resolve the technology transfer problem in the LOS Treaty.

One approach could be to link the granting of marine patents via the TABO/TACO/MPS with a requirement for technology holders to participate in the regional and national technology centers. For example, in return for the granting of a 3-5 year initial patent, a technology holder would be required, at the end of the patent period, to provide plans, technical assistance, and training to a regional center to support their study and development of his patent technology. As an option, the technology holder could renew his patent to the 7-10 year point, but would be required to provide some portion of his royalties/return to a regional center for its general research and development during the additional period of patent protection. Additionally, funding to the regional centers could be provided from other revenue sources available to the Authority, such as its general fund or the taxes collected on exploitation of the continental shelf beyond the 200 mile economic zone, as currently envisioned in the Treaty.

The initial establishment of the regional and national centers would be the responsibility of the coastal developing states. Such establishments could provide a

source of employment and focus for the returning individuals educated in the Western marine technology programs, as discussed above. Particularly in the regional context, the centers would not constitute an onerous burden to the developing states. A further means of reducing cost would be to provide each regional center with an industrial country "sponsor" to help defray costs. For example, in a Mediterranean regional center, France could take the lead in providing "start-up" funds for such a project, although it should be located in a developing country. In the Caribbean, on the other hand, the U.S. could be the "sponsor", while the center would be located in Jamaica, perhaps. Other possible regions might include East Asia, with possible Japanese sponsorship or the Indian Ocean, with assistance from the U.K.. Other Western powers might also be willing to provide assistance in different regions.

Another positive aspect of the regional and national technology centers in the developing world would be the opportunity to provide communication and technology flow between LDC centers and similar centers (Woods Hole, Scripps Institute, and so on) in the Western world. One

problem for the developing world today is the lack of infrastructure to receive technology and scientific data and information that is available from the West. Such centers would provide a means of doing so.

Additionally, the centers would provide an enhanced means for scientists, businessmen, academics, and students to take their skills to the developing world. In a sense, such centers might provide a sort of 21st Century version of a Peace Corps, at least in the marine scientific areas. The advantage of undertaking such work in the marine area is the Treaty infrastructure that could be brought to bear to support them via linkage strategy. Combined with education for developing world students in the Western system, the regional and national centers might provide a highly effective program to enhance technology transfer and ultimately make a real contribution to technology production.

Obviously, the ultimate goal, from the standpoint of the developing world, is to develop their own sources of technology. From the standpoint of the Treaty, the concept of the regional and national centers, with required support

from the developed world, might serve to provide a new linkage sort of strategy and assist the resolution of the technology transfer issue.

Joint Ventures and Profit Distribution

The general concepts of using the U.N. forum, the use of a marine patent system, the benefits of the education process, and the formation of the TABO and TACO have all been explored. A final proposal is that the mechanism of joint ventures be used, where possible, to advance the transfer of marine technology. Such joint ventures could be undertaken between a variety of partners, but our focus in this recommendation is on projects between MNCs and LDC partners (including both private sector and governments).

This could be written into a new draft of the deep seabed mining provisions as an amendment, and would only express that the preferable method for transferring technology would be a joint venture between the industrial corporations and LDC partners. Much of the problem with the technology transfer provisions of the Treaty (to say

nothing of larger North-South problems) is the antagonistic relationship that normally dominates dealings between the two sides. Mandatory technology transfer, as described in the Treaty, is a perfect embodiment of that antagonism---it assumes that both sides will fight each other with little hope for peaceable compromise between them. Mandatory technology transfer should be a last resort---but the Treaty implies it will be the order of the day. The current wording of the Treaty seems to emphasize the role of the Enterprise/Authority in a competing or even confrontational stance with the MNCs.

One way to encourage the joint venture mechanism (which my research shows is favored by both developing and industrial country businessmen) would be an escape clause from mandatory transfer that could be invoked where the MNC could prove it had made good faith efforts to undertake a joint venture. Additionally, arbitration via the TACO or one of the LOS Tribunals could be used if necessary to rule on such a clause. Such an amendment could encourage the use of technology transfer through the joint venture method.

Finally, tax incentives could be placed into any new

version of the Treaty that would benefit those firms that undertook joint ventures and penalize those that "go it alone". An example of this might be credits within the Western industrial countries that would provide incentives for joint ventures. If Kennecott was willing to undertake a joint venture with a group of developing countries for deep seabed mining, they might receive a 10% investment credit (on the specific project) in the U.S. tax system. Obviously, such benefits would ultimately be coming at the expense of taxpayers in the developed countries. This would, in effect, constitute an effective means of providing economic aid. It could further be linked with overall industrial country goals in any further discussions. Such an approach would probably transfer more technology than all the mandatory clauses in the Treaty at present.

Summary of Recommendations

To summarize, the aspects of this broad proposal, intended as a starting point for renegotiation, include:

- o Continued use of the U.N. as a forum for discussion on marine technology transfer.
- o Explore the possibility of either reopening the UNCLOS III Treaty for renegotiation. Consider the possibility of reopening only the deep seabed mining portions of the Treaty. Use the following recommendations as a starting point for such negotiations to deal with marine technology transfer.
- o Endorse the common heritage principle as extending to technology that is used to exploit the common heritage, under very specific circumstances and conditions, as detailed below. Specifically disavow the linkage between marine technology transfer in the Law of the Sea context and the broader issues of technology transfer as per the NIEO, UNCTAD, Paris talks, etc.
- o Develop means of utilizing Western educational systems to provide training and technology transfer to developing countries. Consider the establishment of a fund to sponsor developing country students in their studies, as described above.

- o Establish regional and/or national technology centers for the long-term purpose of providing technology independence to the developing world. Work for a means of funding that will rely on revenues generated by deep seabed mining projects and enhance cooperation between the centers and the MNCs.

- o Develop Treaty clauses that encourage first use of joint ventures, both as a vehicle for technology transfer and in deep seabed/common heritage exploitation generally. Explore the possibility of a "good faith joint venture" clause to allow an MNC to avoid mandatory technology transfer.

- o Institute positive taxation benefits and penalties that encourage joint ventures.

- o Establish a Technology Assessment Board for the Oceans (TABO), a Technology Arbitration Council for the Oceans (TACO), and a Marine Patent System (MPS) as an Annex to the Treaty.

- o Provide some limited patent protection, via the organs described above, for specific technologies (between 3-7 years).

- o Increase protection for sensitive military and commercial technology, including stiffer penalties for commercial or general espionage by Authority and TABO/TACO employees.

- o Develop a means to tax some percentage of monopoly rents accruing to those holding MPS patents. Use the funds to finance the TABO/TACO, as well as the scholarship fund and regional technical centers.

- o Develop taxes on the profits of MNCs conducting "lone ranger" (i.e. non-joint venture) mining operations. Use the funds to finance increased access to institutions of higher learning for LDC students and sabbatical teaching at LDC institutions by marine experts on technology, as mentioned above.

- o Provide a small scholarship fund or training institute to educate LDC personnel in technology transfer, patent law, industrial economics, etc. Finance this by contributions from MNCs, Patent Law Associations, etc. This could be conducted in cooperation with the work of the TABO/TACO at their academic locations.

Implementing the Solution

The question of implementing any recommendations to a contentious issue such as that of marine technology transfer in the Law of the Sea context is a difficult one to address. The variables involved in the calculus are numerous. The problem receives little attention in a world concerned with events on land. The best approach is probably to posit three scenarios, commenting on how to approach implementation in each briefly.

1. CASE I: While highly unlikely in the near term (5-10 years), the simplest and in some ways best solution would be for the remaining industrial "hold outs" to sign and ratify the Law of the Sea Treaty as it stands today. Many close observers of the Treaty process (such as Elliot Richardson, Lee Kimball, Claiborn Pell, William Burke and many others) firmly believe that the problem of marine technology transfer could be handled acceptably (from the industrial/MNC standpoint) within the framework of the

present Treaty. They point to the safeguards in the Treaty for military-security sensitive technology, the ability of an influential actor like the U.S. to mold the Treaty as a member, and other minor changes that could be made in procedure. One commentator has likened the Treaty to a balloon, saying that it will rise or fall depending on what's inside. His implication of course, is that it would be possible to mold the process of technology transfer to make it less onerous than some industry and government representatives currently believe.

In this scenario, mining will probably not begin before the turn of the century, given land-based sources and at-sea costs. During this time, the argument goes, the industrial countries could continue to negotiate the technology transfer provisions, shaping them before they would ever be placed into use. The industrial countries would be able to use considerable economic and political influence to do this, and could probably do so if they presented a solid, unified front in the ISA and Council. Some of the other problem areas of the Treaty (from the Western standpoint) could probably be changed at the same

time with persistent negotiation and the show of good faith offered by initially signing the Treaty. Eventually, a better solution, incorporating some of the other ideas in this chapter, might be possible. There is nothing in the Treaty, for example, that would preclude setting up a TABO/TACO/MPS arrangement if the Western countries could convince the LDCs to go along. This might be possible from a position within the Treaty. It will be much more difficult from without. The world organizations might be able to pursue a parallel track in their other deliberations at the same time, with good effect and issue linkage ensuing.

Lee Kimball, of Citizens for Ocean Law, has commented extensively on some recommendations that the Preparatory Commission (which is a functioning entity today) could undertake. In a scenario such as this, of course, Western influence on the PrepComm and the ISA could be significant. Some of the recommendations she has mentioned, which are detailed here as an example of this kind of process, might include:

- a) PrepComm could mandate rules, regulations and

procedures to deal with staff violations in technology transfer situations.

b) It could develop rules, regulations, and procedures on transfer of technology which would refine and clarify the definition of technology , criticized recently as being too broad.

c) It can elaborate principles and guarantees which constitute "fair and reasonable commercial terms and conditions" and which apply to the determination as to whether or not technology can be obtained on the open market on fair and reasonable commercial terms and conditions, thus mitigating additional criticism.

d) It can more clearly specify the obligations and limitations thereon of third-party suppliers of technology.

e) It can address the relationship between security sensitive technology and the miner's basic obligation.

CASE II: In a second scenario, the Western powers might reject the Treaty in a block---at least the U.S., U.K., West Germany, Italy, Belgium, and several others seem willing to do so at this point. These countries could then

move among themselves to sign an accord of their own on the deep seabed. They would probably couple this with unilateral declarations on other aspects of the Treaty that they found acceptable, such as the Exclusive Economic Zone, territorial waters, high seas, passage, and so on. The U.S. has already moved strongly in this direction with the Reagan Proclamation of March 5, 1983 (establishing the U.S.'s EEZ and affirming many other Treaty provisions). The U.S. is also trying to convene a mini-Treaty group to study the possibility of such an accord between amenable allies. The consequences of such actions would be to worsen North-South relations, defeat much of the driving force of the technology transfer portions of the NIEO, and drive a strong wedge between the Western powers in the mini-Treaty and those in the LOS accord. The value of the mini-Treaty would be controversial in international law, as the overwhelming numbers of UNCLOS III would be weighed against the political-economic powers of the mini-Treaty group, which might represent as much as 30% of the world's GNP. Many questions about conflicting Treaties would absorb international lawyers, but the long-term effect

would probably be detrimental to mining or reasonable exploitation of the seabed. The resulting confusion over a proper regime would make financing and insurance difficult. The possibility of actual conflict at sea cannot be excluded, as discussed by several planners and Naval Officers in published works.¹³

In such a scenario, planners would have to work at defining particular national interests and implementing them as possible. This is similiar to the "fallback" plan called for by Henry Kissinger, among others. It is not inconceivable that what happened to the world economy in the interwar years, a disintegration into competing blocks, is a possibility for the oceans in the next fifty years. Such a case would involve harsh considerations for planners, and would essentially preclude the implementation of the recommendations in this chapter.

CASE III: A third and final scenario might be termed the "wait and see" case. At present, only nine countries have ratified the Law of the Sea Treaty. There is no pressing need to conduct deep seabed mining. Other concerns are more pressing on planners' agendas. The major

¹³ "Resource Was at Sea in the Ocean Age," a draft of such an article, will appear in the July, 1984 issue of the U.S. Naval Institute Proceedings, for example.

industrial "hold outs" can easily afford to simply wait and see what the outcome of the Treaty is likely to be. Some developing countries have advocated ratifying and instituting the Treaty and condemning those outside it. Some have called for sanctions on countries outside the Treaty, to include exclusion from vital shipping lanes and straits. Others, disgusted with the rejection of the Treaty, are threatening to return to simply claiming huge chunks of the oceans off their own coasts as territorial waters, a situation similar to that which brought about the entire UNCLOS process in the 1950s. During this interim period, the industrial countries will stay outside the Treaty and rely on unilateral declarations.

In this case, it would be possible to work toward a renegotiation of the Law of the Sea Treaty. Such a reopening of the Treaty would take considerable diplomatic skill and compromise from a host of actors. It might even be possible, as discussed above, to undertake a renegotiation only of the deep seabed mining provisions. In such a case, planners in the "hold out" countries should work actively to put forward such renegotiation. It is

clearly in the interest of the West, and the rest of the world, to develop a clear ocean regime. Such a regime must include a viable sub-regime for deep seabed mining and marine technology transfer. It is not impossible to attain such a composite package of norms on the way to a more enlightened world order. Now is the time for men of vision to begin.

Conclusions

In writing this dissertation, I have kept in mind two broad research questions. The first was: How important was the issue of marine technology transfer to the emerging ocean regime and the Law of the Sea Treaty? The second was: What are the implications of the technology transfer regime as it finally evolved for policy planners and how could it be improved to induce full Western participation in the Treaty without losing the G-77? In the course of the analysis presented in the preceding chapter and in the

recommendations directly above, both of the questions have been addressed. It remains here in these concluding pages to try and bring together some final thoughts of importance to the overall topic.

As Professor Robert G. Meagher has succinctly commented,

" . . . transfer of technology will be one of the key international issues over the coming years."¹⁴ At the same time, the development of an equitable, politically stable regime for the oceans will continue to be an even larger international issue. This dissertation is about the intersection of the two concerns. The issue of marine technology transfer in the law of the sea context will ultimately influence the distribution of wealth and the way global society is structured in the future, important political issues indeed. As Alan Beesley, perhaps the most influential Western diplomat involved in the Treaty process, recently commented, "the issue of marine transfer of technology was an extremely important one not only in its influence on the dynamics of the negotiations on the seabed regime, but on its overall effect on the attitude of

¹⁴Robert Meagher, Professor of International Law and Economics, The Fletcher School, Interview, Medford, MA, April, 1983.

the participants."¹⁵ This is a view echoed by virtually every observer of the Treaty process, from Elisabeth Mann Borgese to Ronald Reagan. Today, 73% of the inventions listed for patent protection in the world come from four countries---the USA, USSR, West Germany, and Japan. This is not suprising, since only 2% of all R&D is undertaken in the developing world. Clearly, the Law of the Sea Treaty was viewed by many in the developing world as a mechanism to change those statistics. The impact of the marine technology transfer clauses in the Treaty will not be felt in a direct way for many years---at least not until deep seabed mining begins. This might not be for several decades. Even after mining commences, the opportunity to apply the legal mechanisms for mandatory technology transfer will be few, at least in the first years of mining, when few MNCs will be willing to undertake the risks of such operations. Far more significant for the global community are the implications of the marine technology transfer provisions on precedent in negotiation and development of business relations between the developing world and the MNCs and developed countries.

¹⁵Alan Beesley, Letter, December, 1983.

The conflicts which emerged between the developing countries on the one hand and the MNCs and developed countries on the other were anything but new, of course. The attempts of the U.N. leadership, in the persona of such individuals as Hamilton Amersinghe, Tommy T.B. Koh, Cornelius Metternich, Elliott Richardson, Alan Beesley, et.al., to mediate between the contending actors eventually failed. The contentious issues were reflected not only in the Law of the Sea Treaty, but in other fora of the period, as well as the global arena at large. The eventual form of the Treaty has proved unacceptable, at least thus far, to the United States and other important Western European powers. Yet the issue will not go quietly away. The developing countries will have to go on importing expensive marine technology. They will feel excluded unjustly from the "common heritage" should the U.S. or other powers use their advanced marine technology to mine the deep seabed. The developed countries will continue to press for a means of conducting mining without having to share technology or profits with the developing world. They will seek to do this in a way that minimizes political and strategic losses

while advancing economic gains. The world organizations, both the U.N. and the International Seabed Authority (when it comes into being), will try to find a means of compromising between the two groups. The path to compromise will probably require further negotiation and refinement of the marine technology transfer portions of the Law of the Sea Treaty. The policy recommendations presented in this document, which constitute essentially the seven point plan elaborated above, offer a starting point for new discussion. Ideally, such a discussion could be undertaken within the context of the already negotiated Treaty. It appears likely, however, that in order to obtain full Western participation in the accord, at least some portion of the Treaty will require renegotiation. The long term implications, not only for the seabed, but for Antarctica, the Arctic, outer space, and the world order, are profound.

Final Thoughts

This dissertation has attempted to explore the attitudes, facts, and dreams of men involved in forming a viable ocean regime and a marine technology transfer sub-regime. It is, in some ways, a quiet issue, devoid of publicity or the glare of the mass press. The general public is utterly unaware of either the Law of the Sea Treaty or technology transfer as an issue. We are overwhelmed by events and news in a society that occasionally seems to be spinning apart, a falcon unaware or unwilling to hear the falconer at the center of its ordained (or, some would say, random) pattern. "Public opinion," such as it exists today on these issues, is manufactured by a small handful of lobbyists, businessmen, government officials, academics, and journalists.

This dissertation has been an attempt to present all sides of a complex, though relatively unknown issue in an objective fashion. Additionally, the formulation of policy recommendations has been undertaken. It is important to remember that in many ways the questions addressed here are

on the cutting edge of what could be the great conflict of the next century: Competition for a division of resources among a growing world population, a competition that will be carried on not in the East-West context, but in terms of survival, wealth, and poverty as they apply to mankind as a whole. It is for this reason that rapproachment and direction are necessary and indeed critical if the world is to achieve that illusive and transitory concept that men label "justice." In the final analysis, the issue of marine technology transfer is only a part of the much larger issue of what is indeed the common heritage of mankind? The deep seabed? Technology? Justice itself? All mankind does have a stake in the exploitation of the oceans, but it must be done carefully and with due concern for the interests of all parties, from the masses of the developing world to the corporate stockholders of the industrial nations. This dissertation has offered research, facts, and proposals to serve as a starting point to move from what is today a situation in gridlock. It is hoped that each of the contending sides in the issue will be able to offer some compromise in order to achieve that

which is most important: A lasting accord, strongly based in international law and ratified by a full global consensus. From the oceans to the earth, said the ancient Greeks. They were not so far wrong as their mythology might imply.

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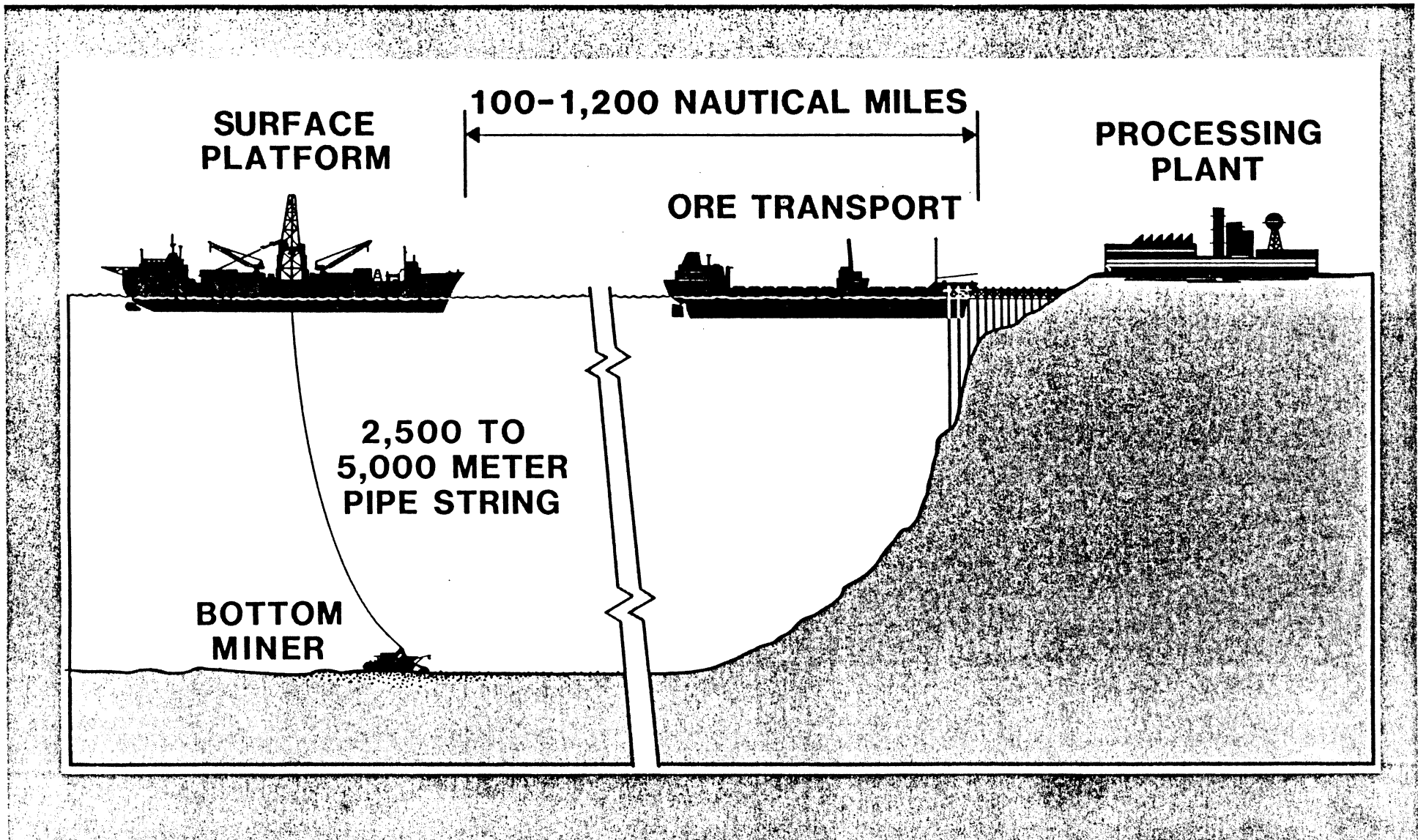
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ANNEXES

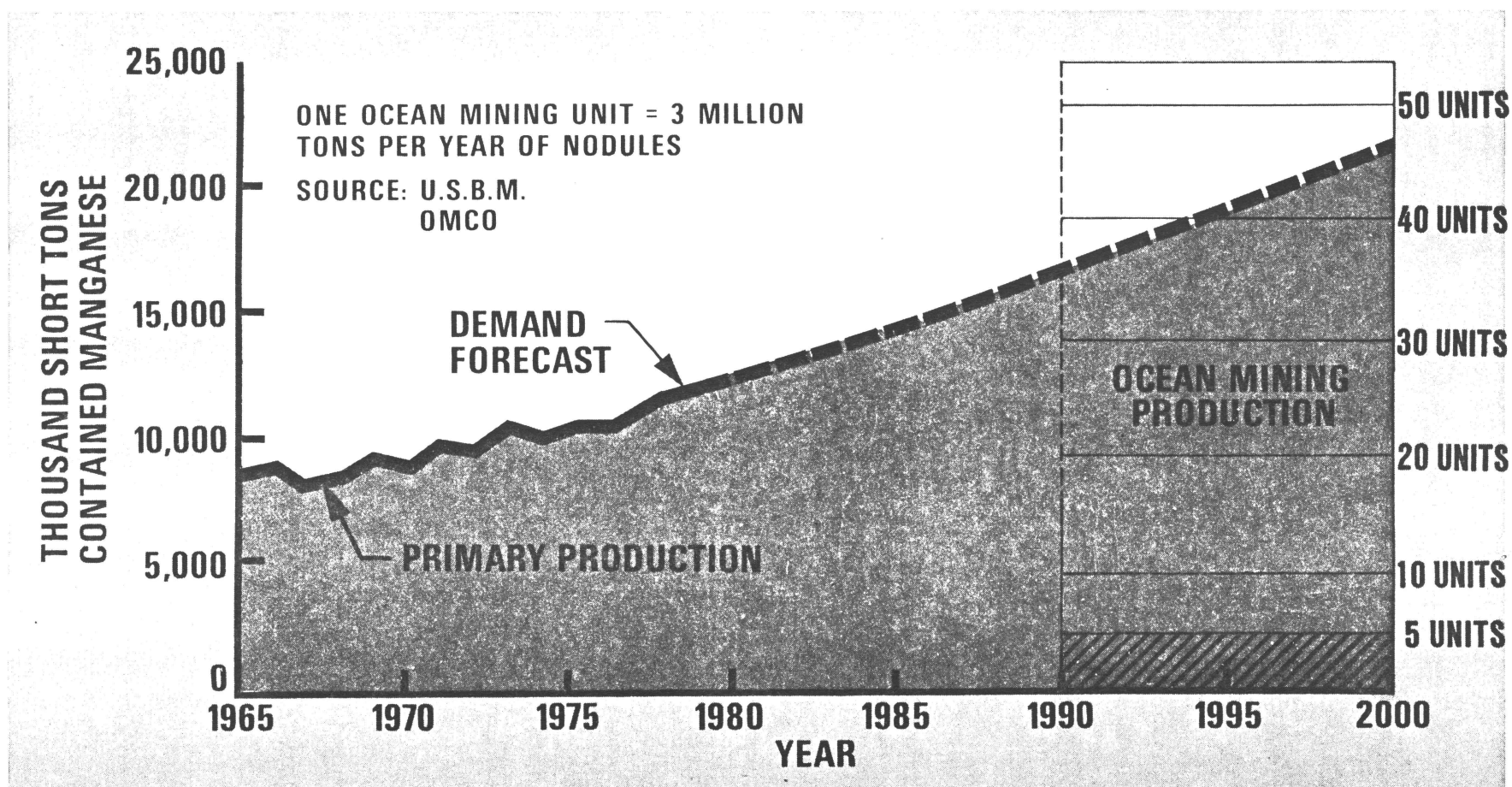


DEEP OCEAN MINING AND PROCESSING SYSTEM



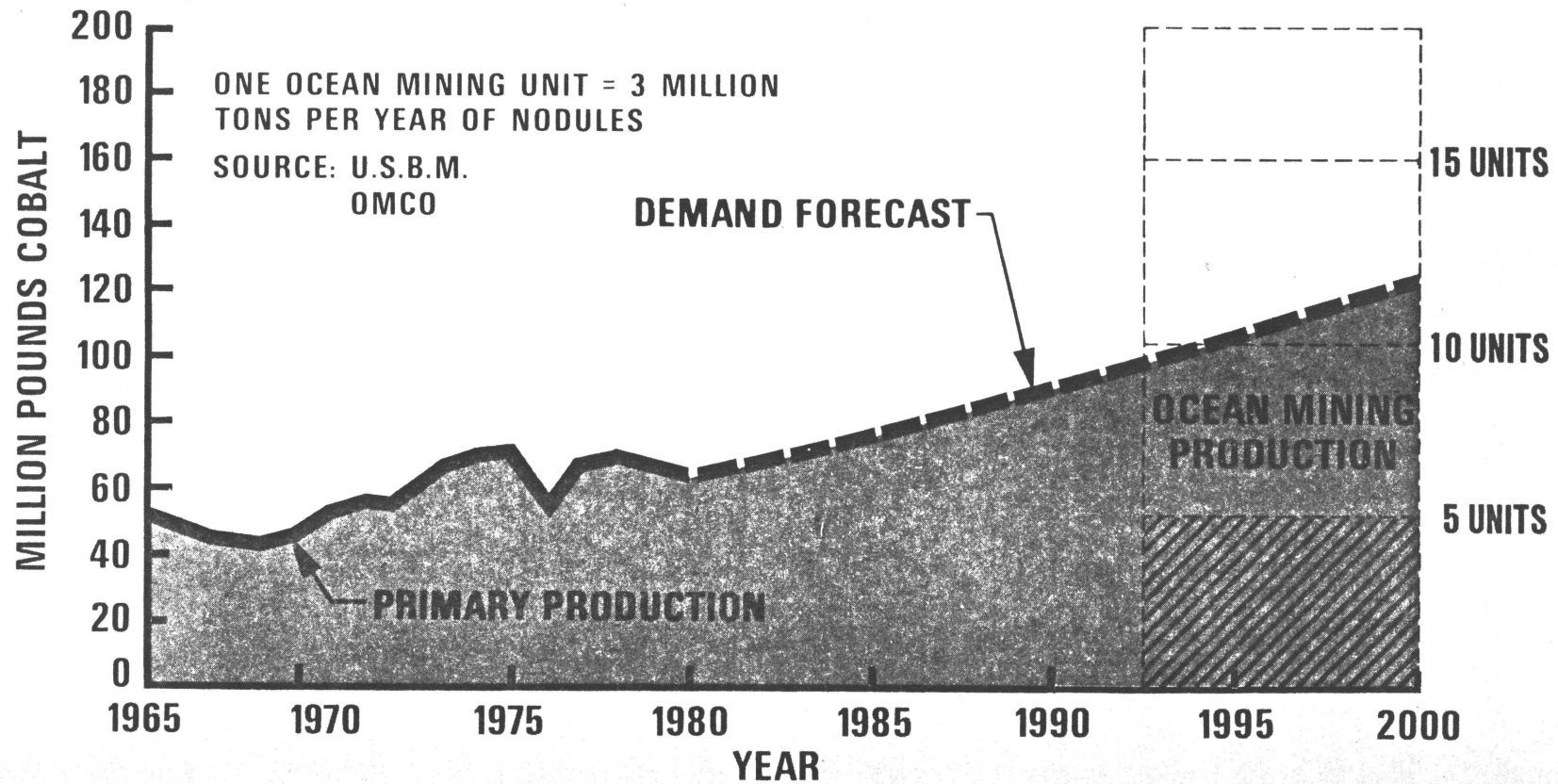


World Manganese Consumption (Mn Content)



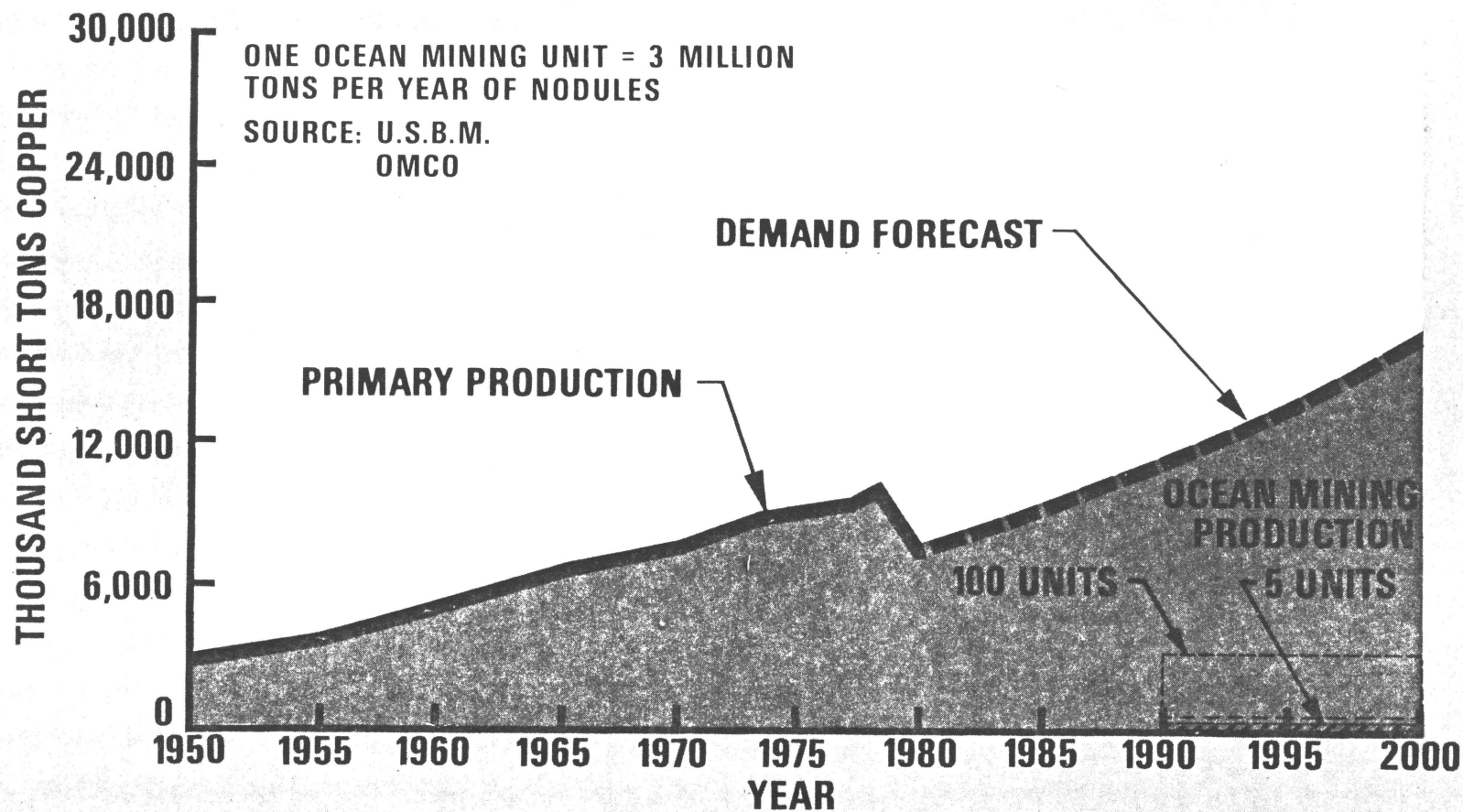


World Cobalt Production and Demand Forecasts (Primary Cobalt)



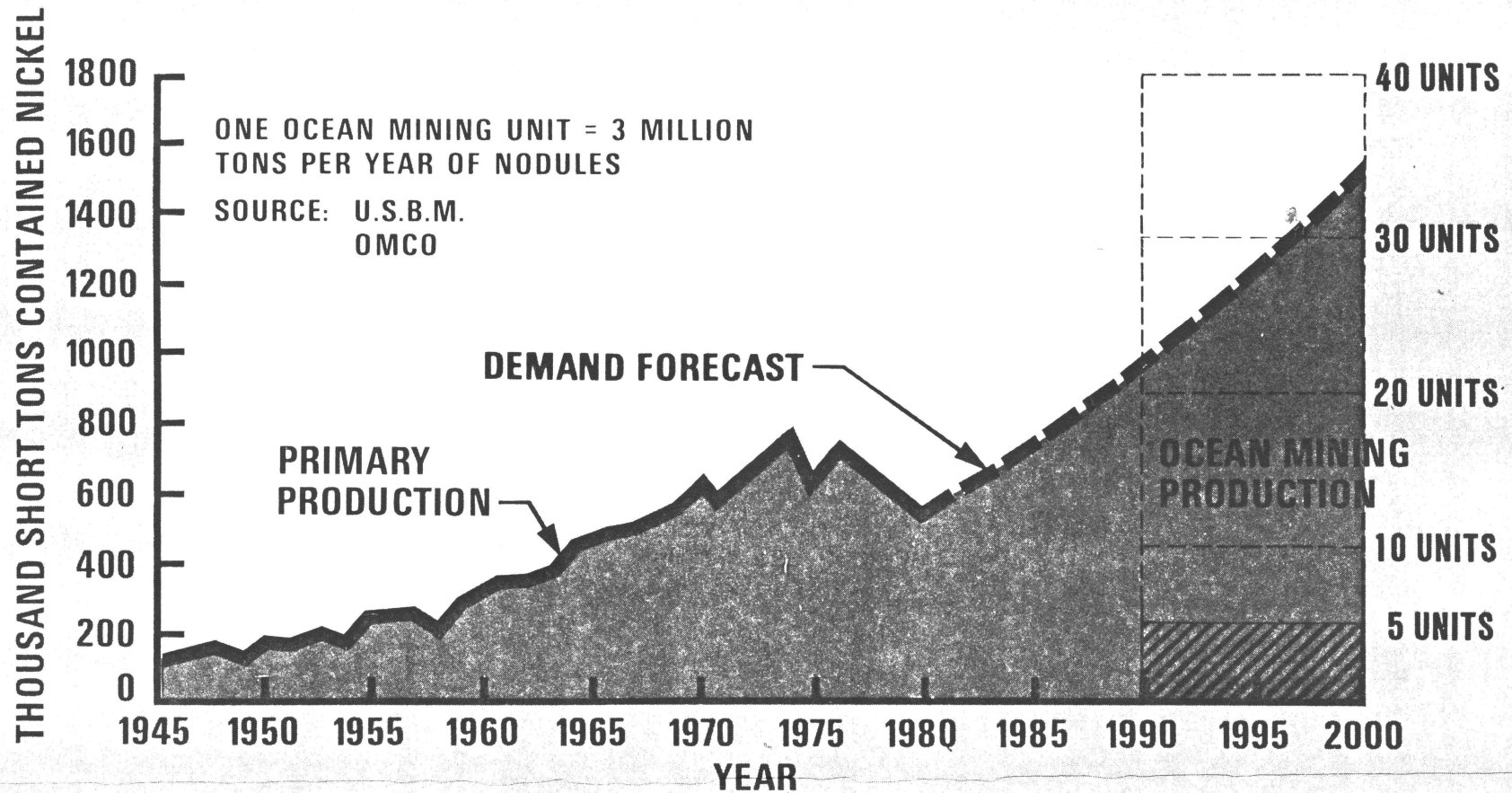


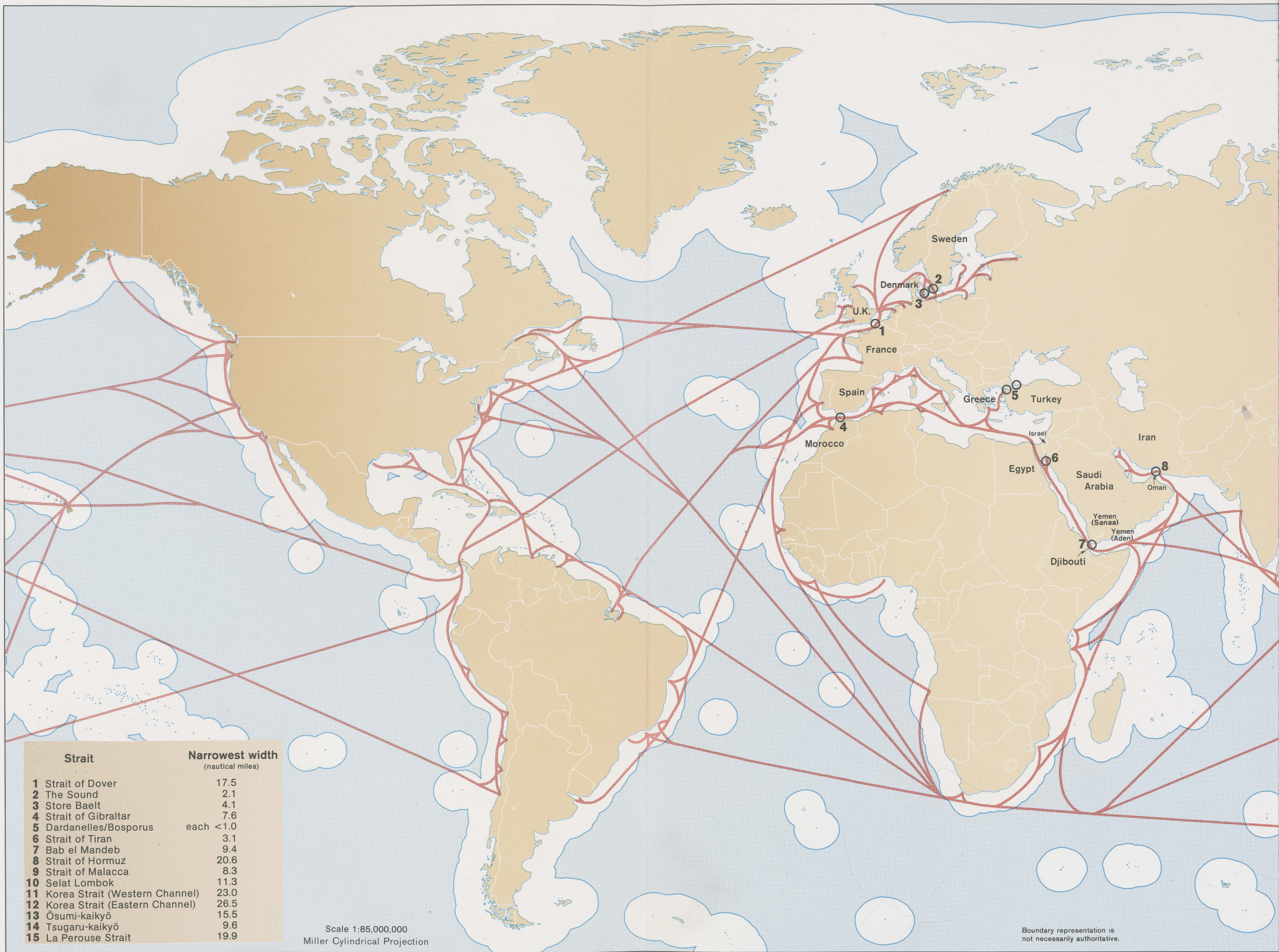
World Refined Copper Demand (Primary and Scrap Metal)





World Nickel Consumption (Primary Metal)





Strait		Narrowest width (nautical miles)
1	Strait of Dover	17.5
2	The Sound	2.1
3	Store Bælt	4.1
4	Strait of Gibraltar	7.6
5	Dardanelles/Bosporus	each <1.0
6	Strait of Tiran	3.1
7	Bab el Mandeb	9.4
8	Strait of Hormuz	20.6
9	Strait of Malacca	8.3
10	Selat Lombok	11.3
11	Korea Strait (Western Channel)	23.0
12	Korea Strait (Eastern Channel)	26.5
13	Ōsumi-kaikyō	15.5
14	Tsugaru-kaikyō	9.6
15	La Perouse Strait	19.9

Scale 1:85,000,000
Miller Cylindrical Projection

Boundary representation is
not necessarily authoritative.

Selected World Shipping Lanes and Straits

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