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THE FUTURE OF NUCLEAR WEAPONS PROLIFERATION

IMPLICATIONS FOR WORLD SECURITY

A Research Paper presented by

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INTRODUCTION

> Once proliferation passed a certain stage it might not be a question of who could "go nuclear", but rather of who could afford not to. - Carl Jacobson, The Nuclear Era

The issue of horizontal nuclear proliferation, the spread of nuclear weapons to more and more countries, has declined in recent years as increased East-West tensions and talk of the new Cold War have occupied center stage. The dormant "specter" of nuclear proliferation, however, seems to be rising once again as evidenced by perceptible world trends in this direction, the renewed interest of academics, and the expanding amount of news coverage devoted to the issue. The forthcoming 1985 Nuclear Non-Proliferation Treaty (NPT) Review Conference also will signify a period of increased attention to the matter.

Although many earlier predictions of proliferation, especially in the 1950s and 1960s, have consistently missed the mark, many analysts now believe that the late 1980s could be the watershed period of the efforts to control the spread of nuclear weapons, and by the end of this century, the number of new nuclear weapons states could number between 20 and 30 (i.e. Lellouche, 1982a, p. 176; Jacobson, 1982, p. 97). Despite the fact that others contend the spread of nuclear capabilities can be highly contained (Dunn, 1982), few would assert that the door to the elite nuclear club can be held completely shut.

Thus, this paper assumes that horizontal proliferation is, in some form and at least to some extent, inevitable due to the historic nature of world conflict along the lines of Hobbes' state of "warre", the contemporary nation-state system characterized by the absence of formal order or of a higher international authority (international anarchy) and of "self-help" in regards to national preservation and security, and finally to the emergence of several pertinent factors influencing the future probability of its occur-

rence. My long term time frame is between 30-50 years. Indeed, the reality of this "security dilemma" in world politics can be considered the primary reason for the existence of nuclear weapons and the development of trends toward nuclear proliferation. Therefore, continued adherence to the autistic ideals of halting all further proliferation may be mere quixotic misconception.

Unfortunately, most analysts of nuclear weapons politics in general, or specifically of nuclear proliferation, deal excessively with only the short and near-medium terms and lack a farsighted, future oriented perspective. Likewise, in ignoring methods to accomodate nuclear newcomers or to derive some stabilization from the institutionalization of nuclear weapons, many analysts remain overly pessimistic, if not apocalyptic, in their presentation. If we are not all to become "survivalists" once the process of limited nuclear proliferation begins, other policy options should be explored. In this light, this paper attempts to adopt a cautiously positive future oriented approach concerning:

1) The imminence of nuclear weapons spread.

2) the importance of contingency plans to accomodate a world of multiple nuclear weapons states while simultaneously maintaining efforts to discourage and limit its range.

3) the plausible pacification effects of nuclear weapons.

4) the possible stabilizing effects of nuclear proliferation.

5) the potentiality of a new world politico-military order as a result of, or facilitated by, limited and controlled nuclear proliferation.

In respect to the last point, the design and analysis of alternative world orders of security has been a neglected area. Although at times in the past political scientists have encouraged the study of utopias of international security as a viable academic discipline (see Kahn, 1962, p. 351), comparatively little has been advanced on the world order aspects of nuclear weapons. Furthermore, an adequate investigation into the structure of world

order and international politics under a climate of multiple nuclear weapons states has been almost entirely absent.

For the sake of my analysis, the assumption is made that the most important values of any future world order alternative are the security aspects of international self-restraint and the absence of nuclear war. These values are modest and perhaps conservative; however, they remain the most crucial aspects of any future world order. Thus, my primary departure is a preliminary inquiry into the relationship of nuclear proliferation to a particular model of future world security based on the possibility that nuclear weapons can become a substitute for a monopoly of violence at the international level (van Benthem van den Bergh, 1983b).

My analysis is at times necessarily abstract and not intended to precisely mirror reality; it also verges on what could be called "moral exhaustion", a utilitarian approach that seemingly is divest of moral standards. Nonetheless, given the inordinate amount of improvident "moral simplification" present in most discussions of nuclear weapons and nuclear proliferation, this approach to theorizing to many may be a refreshing change. The world may be better off without nuclear weapons. However, nuclear weapons cannot be wished away and apparently they do exert a stabilizing and restraining effect which has the potential to pacify or eliminate conflict and war.

It is certainly <u>not</u> prudent to openly advocate the spread of nuclear weapons or nuclear capabilities because there could be grave dangers associated with proliferation. But it must also be pragmatically comprehended that there are also perils associated with excessive obstinance in the face of an apparent inevitability. Proliferation may educe or demand major changes in the current system of world order; we can attempt to resist them, swimming against the current, or we can flow with the stream, perhaps maintaining control of our destiny. In this vein, it should be reiterated that one of the most salient features of the present nation-state system is the absence of formal order (anarchy) at the

international political level (Mandelbaum, 1977, pp. 15-16; 1983, p. 18); thus it is evident that the study of the dynamics of nuclear weapons proliferation is a paramount aspect of the study of international relations.

In the course of my research, I have admittedly relied heavily on three particular theoretical perspectives. Michael Mandelbaum's Nuclear Future has offered the vision of a middle route between disarmament and nuclear war, never veering to either extreme (Mandelbaum, 1983). The deterrent effect of the absolute weapon makes this course, which will not easily be disrupted by limited nuclear proliferation, viable and quite likely. Secondly, the work by Kenneth Waltz on the possible positive utility of the spread of nuclear weapons has been reviewed extensively (Waltz, 1981). Waltz, the heavyweight of the theory of the beneficial effects of nuclear proliferation, along with several others have made bold advances into the future world of multiple nuclear powers - refusing to retreat to their fallout shelters. Lastly, van Benthem van den Bergh has provided a further insight into the pacifying and civilizing effects of nuclear weapons as an "external constraint towards self-restraint", and as a force potentially capable of imposing order and stability on a world in the grip of the security dilemma (van Benthem van den Bergh, 1983b). These theories provide the framework for my analysis.

This research paper is divided into four principal chapters. The first chapter will present a background of the non-proliferation regime along with a discussion of several pertinent issues influencing the probability of future proliferation. After the foundation is laid in the first chapter, in the second I will endeavor to analyze the actual future nuclear proliferation trends and manifestations along with discussions of redefining proliferation and of minimizing its occurrence.

The third chapter will focus on the conflict stabilization and world order effects of nuclear weapons and nuclear proliferation, primarily concentrating on 1) the new school of thought espousing

the possible benefits of the spread of nuclear weapons, and 2) a particular model of world order based on the possibility of nuclear weapons as a pacifying monopoly of violence at the international level. Finally, the fourth chapter will present an overview and the primary conclusions of the study.

In the addendum, I will speculate on the likely proceedings, prospects, and potential problems of the impending NPT Review Conference in late 1985.

CHAPTER I
CONTEMPORARY ISSUES INFLUENCING NUCLEAR PROLIFERATION

1.1 Background of the Non-Proliferation Regime

Hiroshima marked the advent of the nuclear era. Following the development of the United States' nuclear weapons capability during WWII, knowledgeable observers predicted that unfettered nuclear proliferation, the horizontal spread of nuclear weapons capabilities, would certainly evolve as a serious problem of international relations in the future. But since the genesis of nuclear weapons, the world has witnessed the actual ascension of only five additional nations to the status of a nuclear weapons power: the Soviet Union (1949), the United Kingdom (1952), France (1960), China (1964), and India (1974). The working definition of a nuclear weapons state or a proliferator at this initial stage of my analysis is the official determinant as embodied in the Nuclear Non-Proliferation Treaty (NPT): any nation testing a nuclear explosive device whether for military or peaceful purposes; this interpretation, however, will be modulated in later chapters.

Although the economic, technological, political, and military constraints and barriers to obtaining a weapons capacity were formidable, equally significant was the establishment of an elaborate nuclear non-proliferation regime. The fear of uncontrolled horizontal proliferation of nuclear weapons prompted both the nuclear weapons states (NWSs) and most non nuclear weapons states (NNWSs) to cooperate in an effort to devise technical, and political non-proliferation mechanisms and institutions to prevent and control the entry of new members into the elite nuclear club. The primary organs of the non-proliferation regime are the International Atomic Energy Agency (IAEA), the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), the London Suppliers Group, and the International Nuclear Fuel Cycle Evaluation (INFCE). As a matter of necessity and priority interests the US adopted a leading role in the constitution of these organizations.

Established in 1957, the IAEA was the first of these bodies. The IAEA was a direct result of President Eisenhower's 1953 "Atoms for Peace" plan which was proposed to promote disarmament and non-proliferation through building up the peaceful uses of atomic energy. The stated purpose of the IAEA was to encourage and assist research on, and practical application of, atomic energy for civil purposes throughout the world while simultaneously preventing diversion to military purposes. The IAEA places safeguard inspections, an alarm against potential violations, on the nuclear power facilities of all participating countries.

The second institutionalized non-proliferation component, possibly of the greatest significance, was the NPT, signed in 1968 and implemented in 1970. Because of the prominent position of the NPT in the non-proliferation regime, the treaty warrants more in-depth attention. To reconcile the considerations of both NWSs and NNWSs, the NPT addressed three basic areas: the prevention of nuclear weapons proliferation, peaceful nuclear energy development, and nuclear disarmament (United Nations, 1982, p.169). For reference, the text of the Nuclear Non-Proliferation Treaty is attached in Appendix 1. Firstly, under Article I, the NWSs committed themselves to refrain from the transfer of nuclear weapons or their technologies, and the NNWSs agreed to forego the acquisition of such; the NNWS signatories also accepted international safeguards on their nuclear facilities under Article III. Since 1970 the IAEA has had the key role in ensuring compliance with the NPT through providing and enforcing these safeguards. Secondly, the NWSs, the nuclear fuel suppliers, and the NNWSs with major nuclear industry infrastructures pledged under Articles IV and V to undertake the advancement of atomic energy for peaceful purposes for the benefit of all NPT signatories, albeit with special emphasis on developing countries. At the same time, the expansion of nuclear energy was regarded as a panacea for the world's future energy requirements and as a viable means of economic development for the Third World. Lastly, the NWSs, and particularly the US and USSR, were obliged to assiduously pursue

meaningful and earnest arms control negotiations as an interim step to complete disarmament.

Additionally, in order to further address the security concerns of the NNWSs over vulnerability to nuclear attack or blackmail, the US, USSR, and UK issued a joint security guarantee statement through the United Nations. Security Council Resolution 255 nominally bound these three NWSs to refrain from threatening the use of nuclear weapons against NNWSs and to come to the assistance of any NPT signatory subjected to aggression with nuclear weapons.

The NPT was predominantly the product of a collaborative effort by the US and USSR, but, interestingly, the NPT negotiations were actually initiated by several non-aligned NNWS, such as Ireland, India, and Sweden, concerned over the superpower arms race and the possible provision of weapons to the allies of NWSs (Duffy, 1982, pp. 199-200). During this period, the NWSs were increasingly perplexed by the eventuality of future aspirants to the nuclear club, and the unsafeguarded development of nuclear energy technologies, also a proliferation risk; thus, the NPT was finalized under a world aura ripe for controlling the spread of nuclear weapons. The 1968 Conference of Non-Nuclear Weapons States, which paralleled the NPT negotiations, was also a manifestation of this attitude. To date the NPT claims 124 signatories, though not all of these countries have ratified.

However, optimism in the effectiveness of the NPT was shaken for a number of reasons. In 1974, India emerged as the sixth recognized NWS via the explosion of its "peaceful" nuclear device. This incident touched off a crisis among the nuclear suppliers concerning the deviation of nuclear technologies from civil to military applications; it also caused considerable reconsideration on the part of many NPT signatories. Along with this event the 1973 world oil crisis exposed to both the developed and developing countries the precariousness of the existing energy sources as

well as the exigency of energy independence and less expensive fuel sources. Unfortunately, the modern advanced civil nuclear energy technologies were substantially more "proliferation prone"; in other words, they drastically increased proliferation risks through the development of nuclear power as a source of energy. (The aspects and dangers of the future development of these sensitive technologies will be discussed in the following section.) Therefore, since 1975 many advanced industrialized nations, spear-headed by the US, have discouraged the widespread advancement and adoption of these sensitive facilities.

Partially out of this concern for the organic link between civil and military nuclear technolgies, the London Suppliers Club, the next addition to the non-proliferation regime, was created in 1975. The 15 members are comprised of the NWSs and the other suppliers of nuclear fuels or technologies, coming from both the developed capitalist and communist nations The "London Club" is mandated to coordinate nuclear export policies and has formulated guidelines pursuant to nuclear materials and technologies requiring safeguard inspections by the IAEA. The US took this technical denial approach one step further in 1977 through the enactment of the US Nuclear Non-Proliferation Act. The NNPA retroactively demanded revisions of longstanding bilateral nuclear energy agreements and clearly exhibited the Carter Administration's renewed apprehensions over nuclear proliferation.

The final institution integral to the non-proliferation regime was the INFCE which, initiated in 1977 and ending in 1980, brought together a conference of over 500 experts from both North and South to discuss means to reconcile future nuclear energy needs with the prevention of nuclear proliferation. Predominantly, they sought to investigate ways, either technical or institutional, to increase the resistance of nuclear fuel cycles to proliferation while concurrently promoting energy independence and security. The INFCE, however, turned out to be a one time exercise with no subsequent follow up.

Apparently, the institutions of the non-proliferation regime have played a notable role in preventing or limiting the horizontal spread of nuclear weapons; their success is evidenced by the fact that India's ascent to the status of a nuclear weapons power has remained an isolated anomoly . Of course, certain reports claim Israel and South Africa have both developed and stockpiled a limited arsenal of nuclear weapons but merely have not conducted tests. Furthermore, the short term probability of a successful fruition to Pakistan's bid to achieve a nuclear weapons capability is likely. (These cases and others will be elaborated upon in the chapter on proliferation trends.) Still, the regime, spearheaded by the NPT, undeniably has been at least nominally successful. However, several factors, both within the context of the non-proliferation realm and externally, now seem to collectively signal a turning point for horizontal proliferation, one in which an increasing number of nations will possess either nuclear weapons, an unambiguous weapons option, or the wherewithal of civilian technologies and materiel requisite for production.

The remaining sections of this chapter are devoted to these germane factors which apparently indicate the future inevitability of nuclear proliferation, at least to some degree, namely the development of sensitive civil nuclear energy procedures, the link between proliferation and the arms race, structural weaknesses of the NPT, and the inadequacy of former constraints and disincentives to prevent the phenomenon.

1.2 The Connection Between Civil and Military Applications of Nuclear Energy Technologies

Following the US Atoms for Peace Program in the early 1950s, the potential for the future development of civil nuclear energy appeared almost unlimited; the Northern industrialized nations exhorted nuclear energy for the Third World as a source of cheap and reliable energy leading to fuel self-sufficiency, industrial expansion, social and economic development, and increased

equality. The IAEA was created to regulate the anticipated burgeoning of activities. Although civil nuclear industries began to gain a foothold in the energy field, initial dynamic projections increasingly appeared unrealistic. Thus, one of the primary functions of the NPT in 1970 was to resurrect and repromote the peaceful development of nuclear energy technologies for the amelioration of many world problems. Subsequently, in the wake of the 1973 oil crisis and the concomitant precipitous surge in fuel prices, the urgency of energy independence and inexpensive fuel sources was reaffirmed for developed and developing countries alike. The Third World clamor for increased access to nuclear technologies and facilities, however, laid bare to the NWSs and other nuclear suppliers the intrinsic nexus between civil and military nuclear technologies; in other words, the growth of atomic power industries is positively correlated to the probability of proliferation. This link clearly materialized in 1974 when India detonated its nuclear device, in part using materials and technologies obtained from Canada under civil pretenses.

Even more perplexing at the time were the recent qualitative advances in the technologies of peaceful nuclear energy, namely in fast breeder reactors, enrichment plants, and reprocessing facilities, which would augment the efficiency and competitiveness of nuclear energy in relation to other sources as well as provide a constant supply of fuel through the attainment of a "plutonium economy" utilizing continuous reprocessing procedures. These state of the art technologies, however, are considerably more "proliferation prone" since they drastically increase the availability of weapons-grade fissile nuclear materials (plutonium or enriched uranium-235) as compared with the standard systems of "once through" nuclear fuels.

The prospects of an unmanageable number of NNWSs gaining access to these sensitive facilities, either through foreign assistance or indigenous production, became a primary area of consternation for the NWSs and the other suppliers. Certain estimates concluded that many developing countries, within a few

years, could design and build a plutonium reprocessing facility based only upon open technical literature. Additionally, the NPT and IAEA safeguards ostensibly seemed inadequate to properly administer to the situation (Meller, 1980, p.6). From the point of view of most NWS and nuclear suppliers, therefore, these future advanced technologies would unnecessarily facilitate matters for NNWSs, or non-governmental terrorist or guerilla groups intent on obtaining nuclear weapons.

With the evident deviation of nuclear materials or knowledge from civilian to military applications even more firmly established, since 1975 the US along with several other Western allies have obdurately resisted the widespread adoption of these proliferation prone technologies, the practice of recycling fuel, and the pursuit of a plutonium economy. They also espoused the virtues of alternative sources of energy such as coal, geo-thermal, hydro, and solar. Although these nations comprehended the long term essentiality of these facilities, they perceived the detrimental effects of their premature utilization before further proper experimentation. To the dismay of the US and several other nations, the worst of their initial apprehensions was realized when, in the mid-1970s, Germany and France contracted to supply the entire fuel cycles including sensitive installations, or segments thereof, to Brazil; and to Pakistan and South Korea, respectively. Disconcertingly, many nuclear industry officials and energy planners of the North, and even more so in the South, regarded these high-tech systems as the final fulfillment of the earlier promises that atomic energy would be a solution for the world's economic and energy problems (Nacht, 1979, p. 153). The commercial interests in these deals were also paramount.

Despite the common insistence by the developing world that these technologies be made more readily available and promoted for civil purposes as specified in the NPT, resistance by the US and certain other key allies, such as the UK, the Netherlands, and

Canada, primarily out of proliferation concerns, retarded the development and further integration of this know-how. These nations opted to erect technological barriers to proliferation through such acts as unilaterial embargoes and the formation of the London Suppliers Club and the INFCE. The 1978 US Nuclear Non-Proliferation Act (NNPA) was the symbol of the lead role of the US in the struggle to regulate these proliferation prone technologies. However, the US NNPA radically altered the US approach to non-proliferation and set the stage for multiple confrontations with Europe, Japan, and the Third World.

These confrontations with the Northern allies were predominantly over four questions: 1) the view that breeders and the plutonium economy could be a miraculous source of autonomous energy and eliminate fuel dependency (the US opposed these developments in the short run), 2) the question of nuclear exports and transfer of sensitive materials and technologies to the Third World (the US imposed maximum technical restrictions on such exports), 3) the control and disposal of spent nuclear fuels (the US demanded control over all spent fuels of US origin), and 4) the nature of nuclear safeguards and their function as a prevention to violations or merely as an alarm (the US supported the former) (see Lellouche, 1982a; Jordan, 1979). At least partial consensus on these questions was reached at the INFCE although there were no commitments to implementation.

The Third World also inveighed strongly against the new US technical approach to proliferation and nuclear energy transfer. Currently, Argentina, Brazil, China, India, Korea, Pakistan and Taiwan have the most advanced nuclear energy programs in the Third World and their activities collectively represent about 5% of the world's total nuclear energy generation. (Appendix 2 gives a brief synopsis of the nuclear activities of these leaders in addition to several others). Most developing countries considered the US NNPA unilateral and retroactive, a blatant reneging on NPT pledges on the transfer of civil technologies, and an obstacle to economic development. Furthermore, the US was perceived as an

untrustworthy nuclear supplier. These accusations were ostensibly reconfirmed by the Carter Administration's persuasion of France to cancel one contract negotiated with South Korea and to abrogate another reprocessing agreement with Pakistan, and the US cancellation of nuclear fuel shipments to India for the Tarapur reactor. Some analysts, though, commend the US, and the North in general, for diligence in respect to the NPT obligations and the substantial and responsible transfer of proliferation "proof" rather than "prone", civil nuclear technologies (Duffy, 1982, pp. 210-211). Moreover, the US position can be defended on the grounds that not only are these sensitive facilities likely to multiply proliferation risks, but for these technologies to educe the maximum impact, the recipient nations must already possess a highly developed nuclear energy infrastructure and an extensive internal electricity grid, both of which most developing countries are obviously lacking. According to one analyst, the atomic energy policies of developing countries should be based on need, access, compatibility, and its viability as an optimal choice; economically, politically, and socially, it is irresponsible for a developing country to pursue the development of nuclear power only for purposes of prestige or imitation (Smart, 1982b, p. 39).

Along with these recalcitrant efforts by the US and a number of other industrialized nations, including to a degree the USSR, to downplay the efficacy and desirability of nuclear energy for development, a number of other external factors have caused a severe slump in the nuclear industry during the 1970s; among these are:

1. The realization that reprocessing, breeder reactors, and the plutonium economy are actually not as economically competitive, efficient, or urgent as was originally anticipated.

2. The substantial drop in the growth rate of the global demand for energy and electricity, due to inaccurate initial forecasts, long periods of economic recession, and conscious energy conservation efforts.

3. The accompanying environmental issues and pressure from environmentalist groups, particularly pursuant to storage of spent nuclear fuels and to nuclear industrial accidents such as Three Mile Island.

4. The increasing public resistance to the widespread development of the nuclear energy industry (Lantzke, 1980, p. 45).

5. Bureaucratic problems and infighting in the related government agencies, industries, and social groups.

By the late 1970s and early 1980s it was obvious that civil nuclear energy was not the immediate solution for the world's energy and economic problems of inequality as was originally believed; therefore, the nuclear energy programs in both North and South, in most cases, have been scaled down in the short term. In the US the nuclear industry has nearly ground to a halt due mainly to the factors discussed above. Amidst numerous cancellations for nuclear power plants and virtually no fresh domestic orders, the US nuclear energy firms have been compelled to eke out an existence through foreign exports, attempting to sidestep government transfer controls if possible. Many other European nations have been confronted with the same difficult situation (Walker and Lonroth, 1983). Through the 1970s, however, France and Japan began to emerge as the new leaders in the field. Nuclear energy now provides nearly 50% of the generated electrical output of France and by the year 2000 it could reach 75%; Japan is following similar trends. Another exception is the Soviet Union which also has expanded its nuclear energy blueprint. The noteworthy cases in the Third World which have not significantly curtailed short term nuclear energy plans are South Korea, Taiwan, Argentina, and China. Other developing countries have, in the short term, reconsidered the immediacy of atomic energy in general, and of breeder reactors specifically; thus, the conversion to civil nuclear energy in the South will be far slower than anticipated. Appendix 3 presents a table of the status of civil nuclear power reactors in the world.

This situation, however, has given rise to a new proliferation risk. The depressed internal market of most industrialized countries has brought about a potentially precarious situation whereby nuclear power companies are under compulsion to rely on exports for their solvency. Therefore, most nuclear suppliers are desperate for business and must compete aggressively in the open market, and particularly the Third World, for customers, often without proper regard for the need, access, and compatibility of the particular buyer, nor for the safeguards or non-proliferation standards. A recent study by Walker and Lonroth has shown how the current retreat from civil nuclear energy has created a new proliferation risk in the guise of these Nuclear Power Struggles (Walker and Lonroth, 1983). Additionally, a "Third Tier" of suppliers of nuclear materials and technology has evolved amongst the advanced Third World countries. These new competitors, which often do not apply the same technical constraints as the London Suppliers, could become an added dimension to future proliferation problems (Dunn, 1982, p. 41).

However, despite the setbacks of the late 1970s the atomic power industry is generally expected to "bounce back", and in the medium and long terms nuclear energy, including the sensitive nuclear technologies, will eventually become indispensable to fill future energy needs and imbalances. An investigation of alternative energy sources in the year 2000 such as oil, gas, coal, solar, wind, geothermal, etc. reveals that, due to depletion, environmental problems, or unreliability, these sources must be augmented or replaced by nuclear energy (Jordan, 1979, pp. 3-6). Furthermore, at the INFCE, the US failed in gaining a commitment from its allies to indefinitely forego the pursuit of a breeder, plutonium economy, and although large new deposits of natural uranium have been discovered which lessen the competitiveness and advantages of fast breeders, before the end of the century these technologies will once again emerge vital, especially in Europe and Japan.

Forecasts and predictions for the future growth of civil nuclear energy, although still conservative, range between, beginning from the current level of less than 5% of total world energy supply, a doubling by 1990 (Rogal, 1984); 21% by the year 2000 (Jordan, 1979, p.6); and 18-25% by 2020 (Smart, 1982b, p. 20). Apparently, the short term depression in the atomic power industry will most likely be just that - short term. Long term projections which reveal the future role of nuclear energy, especially the sensitive breeder, enrichment, and reprocessing procedures, also rekindle the fears of the organic link between the peaceful and military purposes of nuclear energy; therefore, a drift to proliferation or a nuclear weapons option are circumstances which should be taken into account.

1.3 The Link Between Proliferation and Nuclear Disarmament

The US, USSR, and UK in the original NPT deal had obliged themselves jointly under Article VI to assiduously pursue and achieve meaningful arms control and disarmament as a condition for NNWSs to forego acquisition of nuclear weapons. Thus, an intrinsic connection was created between horizontal and vertical (between the NWSs) proliferation as regards the process of "general and complete" disarmament. Despite the NWS pledges of intent, their nuclear arsenals have burgeoned steadily in most categories, and efforts to attain a halt on further expansions, let alone actual reductions, have been discouraging.

Though arms control negotiations have steadily proceeded for over a decade in the Strategic Arms Limitation Talks (SALT), the superpowers have realized few notable successes; the failure of SALT II and the Strategic Arms Reduction Talks (START), and the recent Intermediate Range Nuclear Force (INF) negotiations fiasco are cases in point. The superpowers have often been suspect in the sincerity of their arms reduction efforts suggesting to some that the acronym FART (False Arms Reduction Talks) is more applicable than the other negotiation designations. Along

these lines, the superpowers have been accused of colluding to institutionalize and perpetuate their nuclear monopoly and the arms race. As stated by one writer, "the nuclear arms race is something over which the non-nuclear powers have no control whatsoever. They must rely on the good faith of the superpowers." (de Gara, 1970, p. 30).

Unfortunately the continued maintenance of vast stockpiles of weapons by the NWSs only serves to demonstrate to the NNWSs the great utility and prestige attached to such devices. If a general realization sets in that superpower disarmament will not be forthcoming in the foreseeable future and nuclear weapons are here to stay, multiple numbers of countries may reevaluate the benefits and disincentives of proliferation. Increasingly evident, therefore, is the possibility that earnest implementation of Article VI of the NPT is integral to any effective non-proliferation regime. Actually, this is not a new interrelationship. Even during the negotiating of the NPT many nations contended that the superpowers own possession of nuclear weapons provided whatever real rationales existed for NNWSs to go nuclear (Vital, 1968, p. 425). The concerted rejection by the US and the Soviet Union of Romania's proposal at the initial NPT negotiations of a binding, superpower disarmament amendment now, in retrospect, could be considered an indication of the future of nuclear arms reductions.

The apparent logic of this link between proliferation and disarmament is also popular in many current analyses. Walker and Lonroth, in their examination of the corporate competition in the field of civil nuclear energy, conclude with a deviation from course warning that continued vertical proliferation remains the most pernicious threat to international security and peace as well as the most obvious incentive to future horizontal proliferation (Walker and Lonroth, 1983, pp. 177-179). These sentiments are echoed even louder by radical Third World intellectuals who argue that the NWSs should deemphasize nuclear weapons in military policy, eliminate nuclear war fighting strategies, freeze all future force

modernizations, and strive towards complete disarmament, etc., if the Third World is to be expected to refrain from pursuing nuclear weapons capabilities. One of the most popular propositions designed to demonstrate the NWSs sincerity about disarmament is the immediate ratification of a Comprehensive Test Ban Treaty (CTB) which precludes all future nuclear explosives testing; this would in theory be a prelude to future arms control and disarmament measures. However, it certainly would not halt NWS computer simulation testing or nuclear force modernization.

With the inherent correlation between proliferation limitation and disarmament now established, I will attempt to elucidate why future meaningful disarmament is highly implausible if not even undesirable due to 1) its effects on the doctrine of Mutually Assured Destruction (MAD), and 2) the paradoxical consequence that disarmament may actually stimulate proliferation. At this point, a differentiation between the concepts of nuclear disarmament and nuclear arms control is necessary. Entirely different meanings are presently associated with the two concepts, a distinction which fosters confusion among both governments and the public regarding curtailment of the nuclear arms competition. Disarmament refers to the actual abolition or substantial reduction of nuclear weapons arsenals. The concept of nuclear arms control, conversely, has evolved to imply merely the restraint and regulation of the military struggle as well as the pursuit of crisis stability (Burt, 1982); the stated objectives of the US are to: 1) reduce the probability of war, 2) insure damage limitation, 3) reduce the costs of defense preparations, and 4) make the arms competition safer for health. Some quantitative force reductions are encouraged, but deep inventory cuts are not the prime objective and, in some cases, can be considered destabilizing.

The concept of disarmament is inherently alien to military thinking and cogitations of strategic studies; arms control as a means of managing the East-West conflict, however, is more readily palatable. As can be interpreted from the SALT, START, and INF

negotiations and from President Reagan's recent statement (September, 1984) about institutionalizing political dialogues with the Soviet Union, there has been an evident past drift from disarmament to arms control as a priority concern.

This change of emphasis, as well as the subsequent failures of the latter, present somber prospects for arresting vertical proliferation and preventing horizontal, prospects which are further reinforced by other realities. Firstly, the dynamics of the nuclear arms race has a momentum of its own determined by domestic political considerations of the hightest order, commercial economic interests, extraneous events in the international sphere, and superpower perceptions of each others capabilties (de Gara, 1970, p. 30). Secondly, under the present geo-political nation-state system - characterized by "international anarchy", self-help defense and the security dilemma - nuclear disarmament is very difficult if not impossible. Mandelbaum's study, which outlines the probable future equilibrium course between disarmament and nuclear war, partially confirms this hypothesis:

> "Nuclear war and nuclear disarmament are the worst and best of all nuclear futures. They are polar opposites - the inferno and paradise... Nuclear war and nuclear disarmament have something else in common. Neither is a likely nuclear future. Nuclear disarmament is unlikely because it would require a radical change in the way international politics is organized, a change for which there is no clear precedent in 2,500 years of recorded history... (Mandelbaum, 1983, p. 18).

Thirdly, fruitful nuclear arms control agreements will not be easily consummated owing to 1) the current world political climate of distrust and confrontation, and 2) the attendant problems and constraints with arms control which hinder superpower progress. (These shall be discussed shortly.) Lastly, the lobbying pressure of the disarmament and peace movements are unlikely to influence this situation because of the esoteric nature of the debate on arms procurement, arms control, and military strategy.

The improbability of future disarmament as a result of the nature of the contemporary world order has adverse repercussions for the proliferation context, particularly since no transformation is likely in the medium term. Since arms control may offer some hope of assuaging the staunch advocates of disarmament and fulfilling NPT obligations, the geo-political and military problems and constraints of the US and USSR which act as impediments to arms control negotiations necessitate a brief discussion.

Persuant to the US, the practice of political linkage, which implies that arms control should be dependent on Soviet concessions, behavior modification, or acquiescence, has often obstructed negotiations. Secondly, the question of the relative comparisons of inferiority, parity, or superiority of the US and NATO to the Soviet Union and the Warsaw Pact has created a continued quandary in arms control concerning windows of vulnerability, the stabilization of MAD, escalation dominance, European force imbalances, etc. Thirdly, one of the paramount impediments from the US perspective is adequate monitoring of Soviet compliance with agreements. This issue has been marked by distrust for the USSR (as well as vice versa); furthermore, it is one which will become increasingly complex as verification by national technical means (spy plane and satellite intelligence) is rendered obsolete by new weapons such as the cruise missile. Lastly, the arms control decision making process in the US is hampered by excessive disputes and competition between executive agencies, power factions within these agencies, and between the executive and legislative branch.

On the Soviet side, the overwhelming resistance against arms control is caused by the well known Soviet security dilemma as a result of numerous past foreign invasions, long exposed borders, a large number of contingent and potentially hostile neighbors, and its encirclement by an opposing coalition involving the US, Western Europe, Japan and China. Secondly, the Soviet ideology proclaims that the USSR is destined to emerge victorious in any conflict, so

such a proclamation demands the pursuit of superiority and precludes most arms control agreements. Finally, the arms control apparatus of the USSR is characterized by pervasive inflexibility and inertia, as well as a military mindset, which creates an atmosphere resistant to innovation and change (Hollowey, 1983; Gottemoeller, 1983).

But perhaps the most significant restraint on arms control is the mutual requirement of future force modernization and research and development (R&D). Integral to preserving a stable nuclear balance and making a nuclear war unfeasible, the superpowers will steadfastly resist relinquishing these options. Although these qualitative improvements could conceivably increase first strike incentives and possibly upset the nuclear balance, the presence of newer, modernized nuclear weapons systems prevents instability caused by dissimilar rates of atrophy and insures the mutual confidence of each NWSs in its deterrent. Thus, arms control must be subordinated to the demands of strategic realities such as extended deterrence and MAD, and, correspondingly, objectives of negotiations should be scaled down and pragmatized, deemphasizing deep reductions in favor of the goal of conflict stability (Burt, 1982). Partially out of concern for the modernization exigency, the current US administration refuses to resume negotiations on the CTB, and both superpowers balk at nuclear freeze proposals. These modernization and R&D demands apply even more so to the strategic defense initiative which may lead to a new generation of space based weapons and Anti-Ballistic Missile Defence (ABM) systems. The future of the strategic defense initiative and its significance will be discussed in later chapters.

Not only are the chances of meaningful and significant disarmament or arms control slight due to the factors discussed above, but the possibility exists that successful accords will actually exacerbate proliferation tendencies and motivations. For instance, nuclear security guarantees or defense alliances may be jeopardized and lose their credibility following a superpower agree-

ment, thereby encouraging insecure protectorates to consider an independent nuclear force or a weapons option. In a quite different scenario, if the NWSs actuate disarmament, the gap between themselves and the NNWSs will narrow quickly. This event could inspire some countries to contemplate closing the divide even further through proliferation (Duffy, 1982, p. 212).

Seemingly, the superpowers are in a paradoxical "no win" situation in regards to the link between disarmament and proliferation. In other words, the NWSs are "damned if they do and damned if they don't"; however, most factors indicate that they won't or, more accurately, can't! It should also be noted that the previously discussed structural problems, constraints, and impediments to disarmament and arms control have culminated in the recent Soviet termination in late 1983 of all negotiations proceedings, an impasse which most NNWSs are surely observing carefully.

1.4 Structural Problems of the NPT

Despite the apparent success of the NPT in its designated task of preventing nuclear proliferation, many inherent structural weaknesses exist, some recognized from the outset and others emerging only later, which may in the long run prove the treaty ineffective and outdated. This section will concentrate on presenting the germane structural deficiences of the NPT in its current form.

The first major problem within the context of the treaty is that there are a large number of non-signatories, amongst which lie several of the most probable future proliferators. Appendix 4 lists the latest roster of NNWS signatories, thus excluding the US, USSR, and UK. Currently, apart from the 124 signatories there are thirty-odd nations which have refused acceptance of the NPT; most noteworthy of these cases are Argentina, Brazil, Chile, India, Pakistan, Israel, South Africa, North Korea, Spain, France, and China. Several other potential transgressors formerly on this list, such as Egypt, Indonesia, and Turkey, signed the NPT

within the past five years, partially out of response to the 1980 Review Conference. Out of the above list, France and China are recognized NWSs and refuse ratification on grounds of the putative discrimination of the treaty; the other major non-signatories claim rationales ranging from the desire for peaceful nuclear explosive developments to the treaty's inherent inequities. Although this latter group all possess nuclear energy and/or research facilities and are usually considered among the most probable proliferation risks, their domestic nuclear energy facilities are excluded from safeguards. Furthermore, these countries are not restrained by the NPT from the development of a weapons capability. Along this line, there is a discernible past drift of these pertinent non-signatories into the nuclear ranks. This is best exemplified by the case of India; similarly, the current "near nuclear" status of South Africa and Israel, and the apparent near success of Pakistani efforts, evidence this trend.

Another weakness is the intrinsic discriminatory nature of the NPT. Many developing nations lambast the treaty for perpetuating a "have" and "have not" relationship between the NWSs and the NNWSs in nuclear weapons and access to materials and technology for civil nuclear energy. The view has long been popular that the US and USSR have considered themselves outside the constraints of the treaty and have not permitted it to interfere with their short or long term interests (Vital, 1968, p. 428). Additionally, the NNWSs may have made the greatest sacrifice and concessions in order to achieve the treaty. The NNWSs, and particularly Third World nations, could eventually come to the realization that the NPT cannot force disarmament and the promotion of nuclear power for peaceful purposes is no longer a primary objective of the NWSs; in this instance, this "have" and "have not" situation may appear increasingly blatant, thus endangering the future viability of the accord. Moreover, the NPT is further undercut by the curious phenomenon that the NWSs and other nuclear suppliers have actually provided more civil nuclear technology and materials

to non-party (NPT) states than to the signatories which were guaranteed priority access (Beres, 1980, p. 231).

The NPT also, in seeming contradiction to its primary goal of halting proliferation, countenances the spread of sensitive nuclear technologies. Even though the London Suppliers Club is now downplaying the immediate utility of sensitive breeder, reprocessing, and enrichment procedures, the NPT obligation to promote the future worldwide advancement of peaceful and civil atomic energy as a means for economic development and energy independence comes into a head to head collision with the suppliers' dual pledge not to assist, in any manner, nuclear weapons proliferation. Additionally, it is now becoming evident that the NPT can actually be utilized or abused by nations with nuclear weapons aspirations to further their objectives through gaining access to fissile materials and possibly weapons technologies. Indeed, it is possible that Libya, after being rebuffed in its alleged attempts to purchase nuclear weapons from the USSR and China in the early 1970s, may have been compelled to adhere to the NPT for precisely these nefarious purposes. The same could apply to the case of Egypt which signed in 1981. Likewise, though Iraq signed the NPT at its inception, its true intention may have been far less altruistic than it appeared in light of its large number of sensitive nuclear purchases from France.

An additional debilitating factor of the treaty is that it lacks teeth in its task to prevent the diversion of civil nuclear materials or technologies to military purposes. The NPT has no enforcement powers, and, furthermore, it even lacks independent safeguard inspection operations, relying almost entirely on the safeguards conducted by the IAEA. But even the IAEA functions only as an alarm; it cannot <u>prevent</u> diversion, only <u>detect</u> its occurence after the fact (Fischer, 1980, p. 149). The IAEA is granted certain powers of enforcement but the organisation has become highly politicized by the East-West and North-South confrontations, thereby detracting from its full potency and effectiveness. An

example of this politicized nature is the threatened US withdrawal in response to the IAEA General Conference's attempted ejection of Israel from the organization following the Osirak reactor bombing in 1981.

The inadequate definition of a NWS or of proliferation is another salient structural weakness of the NPT. According to the treaty a NWS is any nation which has demonstrated the ability to explode a nuclear device. As manifested specifically in the cases of Israel, South Africa, and possibly Taiwan, nations can covertly develop a nuclear weapons force even much larger than that of India's present potential while avoiding the world condemnation and the stigmatization that has befallen India. Since in the future the route of ambiguous proliferation or a nuclear weapons option - "near nuclear" - will be the most probable form of proliferation, this official, narrow and limited interpretation appears deficient to be useful to address the spread of nuclear technologies and the trends toward the threshhold of an overt weapons program. Reinforcing this statement, the NPT only proscribes the manufacture or acquisition of nuclear weapons and is not sufficiently equipped to prohibit the research and preparations leading to an ambiguous weapons option.

Additionally, integrated into the NPT, the "positive" security guarantees of Security Council Resolution 255, whereby the US, USSR, and UK pledged to defend any NNWSs subjected to threats, blackmail, or attack with nuclear weapons, has been deemed impotent in many respects, particularly the unbinding nature of the defense guarantee. The desirability of these ambiguous "positive" guarantees has been replaced by a NNWS predilection for more credible, activist security pledges through defense alliances and unilateral guarantees or, conversely, for passive "negative" no-first use pledges.

Finally, the last and possibly most critical flaw of the NPT, and one common amongst most such treaties, is the stipulation of the right to abrogate the accord. With only three months advance

notice any nation, which perceives it in their vital interests, is permitted to withdraw from adherence to the treaty. As iterated by Beres in the context of the NPT, "There is no evidence in the history of international relations and international law that states feel themselves bound by international agreements that are deemed contrary to their own immediate judgments of self-interest" (Beres, 1980, p.96). Therefore, for most nations, at best, the NPT can be regarded as an effective device to demonstrate good faith through the acceptance of safeguards and to postpone the immediate need for a nuclear weapons decision; at worst the accord can be viewed, in a crisis period, as a mere convention - not worth the paper on which it is inscribed.

The aforementioned structural weaknesses and problems of the NPT are now particularly crucial in view of next year's 1985 NPT Review Conference which could, as in the previous two conferences, be the scene of extreme discontent and discordance. The NPT Renewal Conference at the treaty's termination in 1995, however, could conceivably be the most critical juncture for the NPT as well as the entire non-proliferation regime since at this event the accord can be renegotiated, adhered to intact, or scrapped in its entirety. The problems and prospects of the forthcoming 1985 conference are discussed in the Addendum.

1.5 The Erosion of Technical, Economic, and Political Constraints

In the past, technical, economic, and political structural constraints together constituted a formidable barrier to the spread of nuclear weapons. The technological backwardness of most Third World countries, along with the application of technical solutions to the proliferation problem on the part of the NWSs and other nuclear suppliers, effectively retarded the capability of most NNWSs during the 1960s and 1970s. Similarly, the economic burden of an indigenous nuclear weapons program, and the development of legitimate, invulnerable delivery systems and command, control, communications and intelligence (C^3I), were

seemingly insurmountable obstacles. The possibility that a proliferator would experience world ostracism and rejection, increased conflicts, and the rescission of security guarantees, was another constraint. Most developed NNWSs were predominantly restrained by only the political and, to an extent, economic constraints; the Third World NNWSs, however, were limited in their aspirations by all three. But through the 1970s the efficacy of these constraints has been incessantly vitiated.

Currently, nuclear proliferation is primarily regarded as a political, problem rather than a technical one as was originally perceived. In 1979 the INFCE concluded that, if the development of nuclear energy for civil and peaceful purposes proceeds unabated, no technical fixes exist to avert the proliferation of nuclear weapons (SIPRI, 1980, p. V). Dunn calls this former technical approach to proliferation a "wasting asset" because of growing Third World capabilities and technologies, a diminished consensus of the current major suppliers, increased gray and black market nuclear deals, and the emergence of the new group of Third Tier nuclear suppliers (Dunn, 1982, p.43).

Pursuant to economic constraints, taking into account the widespread adoption of civil atomic energy, more advanced and economically affordable nuclear warhead and delivery system technologies, and the anticipated continued economic development of Third World countries, the future may witness a loss of their utility and an alteration of the proliferation context. Many analysts have found that the economic cost of developing an initial limited nuclear weapons capacity, 10-20 nuclear devices and simple delivery vehicles, or a nuclear weapons option is so small that it will deter few nations intent on this pursuit; these estimates tend to cluster around the level of 200 million dollars (Graham, 1983; Meyers, 1984; Smith and Soligo, 1983). Similarly, many NNWSs possess the economic resources and wherewithal to purchase or finance a moderate, and semi-diversifed weapons force, along the lines of the original French and British forces, if deemed essential

to their nation interests. (This excludes considerations of technical or industrial prowess.) Graham has estimated the initial cost for India to achieve this level of weapons competency at approximately 2 billion dollars, an amount he believes many other nations can also well afford (Graham, 1983, p. 21). Although this estimate appears somewhat low, for the relatively more advanced Third World nations the costs could certainly prove manageable. Furthermore, in the instance of India, the expected direct reduction in the GDP growth rate of from 1/3 to 1/2 as a result of such a development* could easily be offset by stimulations to other economic sectors and forward and backward linkages (Benoit, 1973). Indeed, a great deal of the process of producing nuclear weapons can be carried out as a by-product of civil programs (Frei, 1982, p. 168).

Additionally, the cruise missile has revolutionized the non-proliferation regime. Cruise missiles are cost efficient and relatively inexpensive, as well as mobile, very effective, and potentially invulnerable; many NNWSs presently possess the aeronautical technologies which could lead to a future capacity for the indigenous manufacture of conventional variants; furthermore, the US, France, and the UK, among others, in the future may escalate sales of conventional versions in order to help absorb domestic acquisition costs. Since the conventional type can also readily be armed with a nuclear warhead, the cruise missile could represent the delivery vehicle of the future for many nations interested in a nuclear deterrent force. However, for a nuclear-tipped cruise missile to have its full efficacy, it must also be accompanied by effective guidance systems such as satellite guidance; this information as well as the data receivers can currently be rented from both superpowers. (For more on the cruise missile, see Pfaltzgraff, 1977.)

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* (Samuel Faltas, Free University of Amsterdam, lecture at the Institue of Social Studies, The Hague - 27/1/84).

The development of a war-fighting capability and C^3I structure along the lines of the current NWSs, however, appears remote for most NNWSs due to the extremely large costs and technological considerations involved.

Lastly, although political concerns are now evolving as the ascendant constraint on proliferation, their utility can be termed a "stagnating asset". The threat of increasing condemnation and rejection from the world community as a constraint now has diminished utility since the current NWSs, including India and China, have attained preeminent status positions. Additionally, it is now increasingly unrealistic that, upon acquiring nuclear weapons, new proliferators will have their past security guarantees or defense alliance membership revoked as a result of their actions. Finally, regarding the possibility of heightened insecurity and increased regional conflicts conceivably acting as a political constraint, the nouveau theories of the potential beneficial and stabilizing effects of controlled nuclear weapons proliferation (Waltz, 1981; Intriligator and Brito, 1978; 1981; Feldman, 1982; and others) have been a catalyst to the reevaluation of the politico-military benefits of a national nuclear weapons program or a threshold posture.

In conclusion, it now appears that the technical, economic, and political constraints on nuclear proliferation will not mitigate risks in the future as effectively as they did in the past. Thus the possible eventuality of proliferation will increase with time. In the words of Russel Fox, the Australian Ambassador for Nuclear Non-Proliferation and Safeguards, "There cannot be a solution in an absolute sense. A country that wishes to develop nuclear weapons, crude or otherwise, will do so sooner or later" (Fox, 1980, p. 145).

CHAPTER 2
FUTURE NUCLEAR PROLIFERATION TRENDS

The purpose of the previous chapter was to introduce the factors, both internal and external to the nuclear proliferation regime, which indicate that the spread of nuclear weapons is an eventuality that should be taken into account. With the implications for the non-proliferation regime of the connection between civil and military nuclear energy, the link between proliferation and nuclear disarmament, the structural weaknesses of the NPT, and the erosion of past constraints now established, the future of nuclear weapons proliferation can be discussed. The purpose of this chapter is to elucidate how the internal and external factors influencing proliferation probabilities are converging with motivations for acquiring nuclear weapons, a situation which suggests that nuclear proliferation, in some manifestations and to some degree, is highly probable if not inevitable. This chapter will discuss the motivations and rationales to acquire nuclear weapons, a proposal for a reformulation of the definition of nuclear proliferation and nuclear weapons state, the future of the proliferation of nuclear weapons, a phenomenon that can be termed "nuclear reliance", and ways of limiting the anticipated spread.

2.1 The Nature of the World Proliferation System

The current international political order of nation-states is the result of the historical, dynamic development of attack and defense units and their consolidation and elimination of rivals. Hobbe's "state of warre" has been inherent in the interactions of these attack and defense units beginning with warrior tribes, feudal kingdoms, city-states, dynastic-kingdoms, multinational empires, etc. The current manifestation of theis progression, the nation-state system, is characterized by: 1) the absence of any international authority and formal order, 2) the paramount position of national sovereignty, and 3) reliance on self-help and self-

preservation for national security and autonomy. This contemporary international system has been termed "anarchical" and has been attributed as the primary cause of the original development of nuclear weapons, the continued tenacious belief in their utility and legitimacy, and the probability of their permanent institutionalization as a component of the world system (Mandelbaum, 1977; 1983). As stated by Mandelbaum,

> "The term for the way the system of sovereign nations, the basic units of international politics, is structured is "anarchy". Anarchy does not mean chaos but rather the absence of formal order; that is the absence of government... Anarchy is the root of the problem of nuclear weapons." (Mandelbaum, 1983, pp. 18-19).

One writer has even stated,

> "The point of departure for the analysis of international politics, of the conduct of states, must be the absence of a central monopoly of violence - or a substitute for it at the international level." (van Benthem van den Bergh, 1983a, pp. 4-5).

Likewise, the reality of the present anarchical nation-state system will exert a major impact on the future of the spread of nuclear weapons. Nations still basically operate under the dictum, "if you want peace, prepare for war"; therefore, in the future nuclear weapons may be brought into this equation for an incremental number of countries. Correspondingly, the decision to go nuclear is principally a consideration of national interests, taking precedence over the collective welfare of the international system or a common altruistic pursuit of non-proliferation. Decisions about the acquisition of weapons of any type, including nuclear, appear in many cases to be no different than any other defense policy decisions (Weltman, 1981/82, p. 182). Evidently, the inexorable "security dilemma" - whereby nations become engaged in a vicious cycle of arming out of defense concerns, which provides the catalyst for others to further arm, in turn substantiating the first nations' initial apprehensions - may be extrapolated into the

future to apply to the spread of nuclear deterrent forces. One also recalls the familiar "Prisoners Dilemma" game where two nations, faced with the decision to proceed with or refrain from nuclear weapons development, in independently attempting to maximize their gains end up both pursuing the nuclear route. In this light, if one assumes - using the popular expression - the nuclear weapons genie cannot be forced back into the bottle, then in the long term, according to the dynamics of the self-help system, the open proliferation of nuclear weapons and of capability options is a plausible scenario.

Naturally, this preceding statement refers to the level of national governments and the interactions between nations on the elite, bureaucratic plane. In many cases, the question of research, development, manufacture, deployment, and reliance on nuclear weapons (or in the case of NNWSs, activation of a fledgling weapons program), will clash with the views of a large portion of the population. It must be realized that nuclear weapons have fundamentally changed the government-citizen relationship and interaction. Thus, in the future it is probable that national governments, and even liberal democracies, will be compelled by esoteric geo-political realities to implement nuclear deterrent policy maneuvers which are vehemently opposed by a majority of the populace. This view is substantiated by Gompert in the context of the current NWSs:

> "If, over time, the need of governments to field expensive deterrent forces is not appreciated by citizens who no longer sense a real nuclear threat, popular support for the maintenance of forces could fade - and governments might feel themselves compelled to provide for deterrence without the consent of the governed." (Gompert, 1977, p. 5).

This actuality is resently observable in progress in Western Europe. The governments of the Netherlands, Belgium, and Germany, among others, intent on their objective of NATO Intermediate-range Nuclear Force (INF) cruise missile and Pershing

II deployments, are coming under scathing attack from large and vocal "peace movements". Similarly, the new protest movements in Eastern Europe have been partially stimulated by the enormous and expanding Soviet INF deployment.

2.2 Future Motivations for Acquiring Nuclear Weapons

Nuclear proliferation is often treated only on an individual, case-by-case basis; however, categorizing and addressing certain groups of states possessing similar proliferation motivational drives is a more suitable alternative (Lellouche, 1982b, p. 63). A discussion of these motivations appears particularly relevant since the political, strategic, and economic acquisition incentives for acquiring nuclear weapons have apparently increased in intensity (Weltman, 1981/82, p. 182). Drawing upon numerous taxonomies of nuclear weapons rationales (Meyer, 1984, is the most complete compilation), I have derived the following classification: internal political support, economic incentives, prestige drives, and security concerns. Out of these, nations will themselves attribute their actions only to economic incentives and security concerns, the two most viable justifications. The foremost motivations, however, are prestige and security. The prestige variant can be subdivided into 1) nations seeking status maintenance or recovery, 2) nations harboring higher status ambitions, and 3) countries desiring autonomy. The security motive can be subdivided into 1) garrison states, 2) nations becoming less secure, and 3) states embroiled in regional rivalries.

International political support. The development of a nuclear weapons capacity may internally generate tremendous domestic support under the proper conditions. This motivational category would generally fall within the sphere of the Third World. Thus, if a country is facing insurmountable economic and social problems and domestic unrest, the government could gain the support of

large segments of the populace. For instance, the government may portray its achievement as an unmistakable indication of economic and technological prowess and world prestige. Additionally, the development may be proffered as an anti-imperialist or anti-neo-colonialist maneuver integral to completing the process of independence and self-determination, thus playing on the nationalist tendencies of the population. Finally, the government of a country long embroiled in an unpopular regional rivalry could conceivably educe public support for the attainment of a nuclear weapons capability. Falling into this category, the leadership of India apparently garnered substantial internal political support for its activities in the field of nuclear explosives (Epstein, 1977, p. 25).

Economic incentives. Many of the economic benefits concomitant with civil nuclear energy are also derived from the development of a nuclear weapons or peaceful nuclear explosion (PNE) program; these include economic stimulation, increased R & D, technological advancement, strengthening of the industrial support base, and benefits to civil infrastructural projects such as mines and earth moving. The Soviet Union's continued countenance of PNE's, which are indistinguishable from weapons devices, lends a further legitimacy to this pursuit. Furthermore, the marginal additional costs of civil nuclear energy decline if it is developed in conjunction with a weapons capability (Frei, 1982, p. 168). Aside from the possible direct stimulus to the economy, security based on a minimal nuclear deterrent could be a more cost efficient alternative to expensive and protracted conventional arms competitions. Moreover, extrapolating from Benoit's findings that the net effects of increased military spending and R&D is positively correlated with economic growth rates raises implications that a national nuclear weapons program could act as a positive impetus to economic growth and technological advancement (Benoit, 1973). No nation, as of yet, has pursued a weapons capability strictly due to this motivation.

Prestige motivation. Obviously, going nuclear elicits international recognition manifested in one form or another. The prestige gained from acquisition can result from real or imagined military strength, from the demonstration of scientific capabilities, or possibly most importantly, from the increased attention from the superpowers (Strong, 1982, p.16). As is clearly demonstrated by common usage of the term "nuclear club" and the fact that the five permanent members of the UN Security Council maintain the world nuclear weapons monopoly, a mystique or special status is associated with nuclear weapons possession.

One sub-category of prestige, which applies primarily to the North, is a quest for status maintenance or recovery. France and the UK are the best examples of this variant; the former striving to regain its pre-war status position through the French nuclear "force de frappe" and the latter, although originally for security concerns, in preserving its diminishing world influence. In the future, other middle powers could opt for this route. Nations such as West Germany, Japan, and Italy could, prodded by waning prestige, seek to uphold their international role in this manner.

Third World countries harboring status ambitions is the second prestige sub-category. Frustrated by the traditional prescriptions for world recognition such as economic development, often slow and difficult, certain developing countries holding status pretensions may pursue a quick route to their desired goal of status attainment through nuclear weapons or a weapons option. Furthermore, other developing countries, which have experienced abundant economic progress, may feel unjustly denied the international prestige they may rightly deserve, so a nuclear weapons capacity is often considered an immediate fix to close the gap between themselves and the major powers. For example, Brazil's GNP is among the top 10 in the world, yet the country is bestowed little prestige or international recognition. The pursuit of regional leadership is also an aspect which must be inserted in this sub-

category of prestige. The nuclear weapons decisions of both China and India, in respect to their endeavors to deal with the superpowers from a more advantageous position, were at least partially influenced by these considerations of prestige attainment.

The third sub-category of prestige motivations can be termed pursuit of autonomy or independence. One manifestation of this motive is Third World countries, especially former colonial possessions, which perceive that, through the acquisition of an indigenous nuclear weapons program, they can realize greater independence from the superpowers and former "colonial masters" in the economic, political, and military spheres. Iran, for instance, may become interested in going nuclear to establish itself as independent between East and West. Furthermore, a series of Third World countries going nuclear could be portrayed as an effort to contribute to their aggregate power and resources relative to the North. Indeed, the net effect of the spread of nuclear weapons in the Third World may be positive in regards to its quest for autonomy and economic redistribution (Knorr, 1979).

Security concerns. Above all the aforementioned considerations, however, security concerns are the dominant determinant in the decision of most NNWSs since a nation's security ultimately takes precedence over all other national or international interests. It is primarily the security matters which could drive escalating numbers toward a nuclear weapons defense posture in the same manner that security concerns were principally responsible for the US, USSR, and Chinese pursuit of a defense or deterrence based on the absolute weapon.

The most palpable security motivation classification is the "garrison" or "pariah" states, a group of nations isolated and ostracized in regional or world politics and usually surrounded by hostile neighbors. The reasons for their quarantined existence can be traced to one or more of several factors namely: the legiti-

macy of the nation's origin, its political system, the ethnic structure, the international behaviour, or the threat of a security isolation (Lellouche, 1982b, p. 65). The garrison state classification is based on an extended period of international or regional isolation under a conflictual relationship, thus producing a siege mentality. Although some garrison states may have security guarantees from foreign powers, these assurances are often informal and are sometimes considered suspect in their reliability. Israel, South Africa, Taiwan, South Korea and Pakistan are cases which best exemplify this phenomenon. Other borderline or potential examples of garrison states include Cuba, Libya, Yugoslavia, Cambodia (Lellouche, 1982b), the Ayatollah's Iran, Egypt, and possibly Albania.

Another important sub-group is that of evolving insecurity. Nations now tied into legitimate regional defense organizations or defense guarantees could experience heightened anxiety and insecurity upon loss of this assurance. Certainly, most nations lie in the defense sphere of either the US or the USSR; many nations are even integrally dependent upon the nuclear deterrent of their "protector". If, for some reason, either superpower withdrew its security guarantee or if NATO or the Warsaw Pact disintegrated, these nations would confront an insecure, precarious future and potential nuclear threat. In contemporary world politics, characterized by the defense system of "self-help", the only solution, in many cases, may be the development of an indepentent nuclear deterrent. Faced with this circumstance, West Germany, Japan, Czechoslovakia, and Vietnam, among many others, would have few alternatives. Perhaps the best example is that of European NATO and the future likelihood of an independent, integrated European nuclear deterrent force.

Lastly, nations embroiled in perpetual regional rivalries in the long term may turn to nuclear weapons, either as a deterrent or as a means of coercion. These conflicts are usually outside the scope of foreign defense guarantees which, therefore, can offer no

alleviation to the insecure relationship. Since these conflictual rivalries come in pairs, a weapons development by one of the adversaries, either for security or prestige motivations, could plausibly be mirrored by the rival states. Pakistan and India demonstrate this situation in progress, and Brazil and Argentina could potentially fall back on the nuclear weapons alternative to lay to rest their long running competition for regional dominance.

2.3 Redefining Nuclear Proliferation

At this point, a clarification or redefinition of the concept of nuclear proliferation, more adequately conforming to contemporary proliferation trends, appears mandated. Currently, the standard definition of a NWS is any nation which has exploded a nuclear device, peaceful or military. This definition, unfortunately, is outdated and often a source of confusion in proliferation discussions as evinced by its unsuitability to the cases of South Africa, and Israel. Although others have proposed alternative determinants, for the purposes of this study horizontal nuclear proliferation will be divided into three categories; 1) nuclear capability option, 2) ambiguous proliferation, and 3) demonstrated proliferation. A capability option evolves either naturally through normal civil nuclear energy developments or through a governmental decision to conduct R&D in the field up to the point of testing or manufacturing. Ambiguous proliferation is defined as any nation that has conducted limited nuclear explosives tests, including PNEs, without subsequent manufacture or deployment of weapons.

Lastly, there is demonstrated proliferation which can be either open, covert, or unorthodox. Open proliferation is testing, manufacturing and deploying nuclear weapons in an unambiguous and declared manner, regardless of the numerical levels or the types of delivery systems. Covert demonstrated proliferation encompasses any nation suspected of clandestine testing or of assembling and stockpiling, but falling short of testing, nuclear

weapons. Determination and identification of this variant depends on three factors: 1) direct access to fissile materials, 2) a political motivation and willingness to acquire nuclear weapons, and 3) substantiation and verification by reliable intelligence, preferably from several sources. Unorthodox demonstrated proliferation is defined as the acquisition of nuclear weapons through theft, purchase, or transfer. Of the three main classifications of proliferation, those of ambiguous and demonstrated proliferation are also identified as nuclear weapon states (NWSs). My modulated definitional classification, integral to this chapter and more appropriate to describe current trends, is as follows:

Categorization of Nuclear Proliferation

Non-Nuclear Weapons State (NNWS)

1. capability option

Nuclear Weapons State (NWS)

2. ambiguous
2. demonstrated
   a. open
   b. covert
   c. unorthodox

2.4 The Future Spread of Nuclear Weapons and Nuclear Capabilities

2.4a Overt proliferation

Given the characteristics of contemporary world geo-politics, the future open proliferation of nuclear weapons or capabilities to some extent appears almost axiomatic. Of course, projecting the concept of inevitability into the future can be quite risky; still, evidence

indicates that, out of several possible outcomes, proliferation to some extent is likely. Indeed, most analysts, to varying degrees, acknowledge the probability of the future spread of nuclear weapons (Waltz, 1981; Kincade and Bertram, 1982; Weltman, p. 182; Jacobsen, 1982, etc.); few would deny the plausibility of some future proliferation and development of small nuclear forces, and those that do are constrained by their short term perspectives (Dunn, 1982; Russett, 1983; Sheehan, 1983). Of course, disagreement exists over such factors as the probable extent and size of forces, the construction of viable delivery systems and C^3I, opportunities to control and limit its occurrence, the concomitant dangers, the possible stabilizing or beneficial effects, influence on world politics, etc. Many of these factors will be discussed in the following chapter in the context of the possible stabilizing effects of proliferation. But, at this point, a small nuclear force (SNF) can be described as a minimum number of 5-6 warheads, delivery systems (fighter-bomber aircraft), reliable nuclear explosive components, and basic C^3I (Jones, 1984, pp. 4-5) In essence, quixotic ideals of indefinitely proscribing all further proliferation have largely been abandoned; however, actions to control and limit the spread can be useful as is discussed at the end of this chapter.

The group of NNWSs possessing the technical capability to manufature nuclear weapons, and considered the most pertinent future proliferators, can be termed the "population at risk" (Meyer, 1983, p. 225). In observing the tendencies of many of these nations, the trends toward nuclear proliferation can be discerned. Study of this population at risk and potential proliferators, comprised of both developed and developing states, has been nearly exhausted by analysts of nuclear proliferation (Dunn, 1982; Epstein, 1976; Yager, 1980; Lefever, 1979; SIPRI, 1972; etc.); however, few attempts have been made to individually quantify the aggregate proliferation risks of these NNWSs in respect to the entire group.

A recent study by Meyer, though, attempts to objectivize these relationships (Meyer, 1983; 1984). In assessing the aggregate individual risk of each near-nuclear country, Meyer examines four factors: 1) lag-time component (period required for manufacture), 2) nuclear-propensity component (inclination to proliferation), 3) proliferation-salience component (the potential detrimental effect on the world system), and 4) treatibility component (susceptibility to non-proliferation actions). Although his findings are based on subjective data (primarily the opinions of experts) his endeavor to quantify and visually display the population at risk is a noteworthy achievement in the field.

Meyer's 36 member population at risk and the accompanying empirical risk-component classifications are exhibited in Table 2-1, and his graphic findings, in which he places each nation in one of 27 cells based on the aforementioned risk components (excluding treatibility), are displayed in Table 2-2. Basically, the aggregate synthesized proliferation risk of each country increases as they move upwards and to the left of each graph (as indicated by the solid arrows), and from the third graph forwards. From Table 2-2 the proliferation danger of each member of the population at risk can be expediently estimated relative to the others, and the dynamics of nuclear proliferation tendencies can be observed. Certainly, this has implications for the application and distribution of the limited resources to treat potential proliferation available to the non-proliferation regime, the NWSs, and the other nuclear suppliers (Meyer, 1983). Based on Meyer's findings, it is easily discernible that Israel, South Africa, and Pakistan represent the most prominent examples of the trend to demonstrated proliferation. Additionally, Argentina, in the aftermath of the Falkland Islands debacle, shifted from a weak to a very high nuclear propensity (as indicated by the dashed arrow in Table 2-2); thus, it can now be viewed as a major proliferation risk (Meyer, 1984).

Table 2.1 Empirical Risk Component Classifications

The Population at Risk

Country	Risk Component: Lag Time[a]	Nuclear Propensity[b]	Salience[b] Total
Japan	1	3	1
FRG	1	3	1
South Africa[c]	1	1	2
Belgium	1	3	3
Italy	1	3	2.5
Netherlands	1	3	3
Canada	1	3	3
Argentina	1	3	2
Spain	1	3	2.5
Israel[c]	1	1	1
Pakistan[c]	2	1	1
DDR	2	3	2
Czechoslovakia	2	3	2.5
Switzerland	2	3	2.5
Norway	2	3	3
Brazil	2	3	2
Taiwan[c]	2	2	2
Yugoslavia	2	3	1.5
Sweden	2	3	3
South Korea[c]	2	2	1.5
Austria	2	3	3
Australia	3	3	3
Egypt	3	2	1
Rumania	3	3	2.5
Turkey	3	3	1.5
Greece	3	3	1.5
Iran	3+	1	1
Libya	3+	1	1
Iraq	3+	1	1
Mexico	3+	3	2
Chile	3+	3	2
North Korea	3+	3	1
Cuba	3+	3	1
Nigeria	3+	2	1.5
Algeria	3+	1	2
Finland	3+	3	3

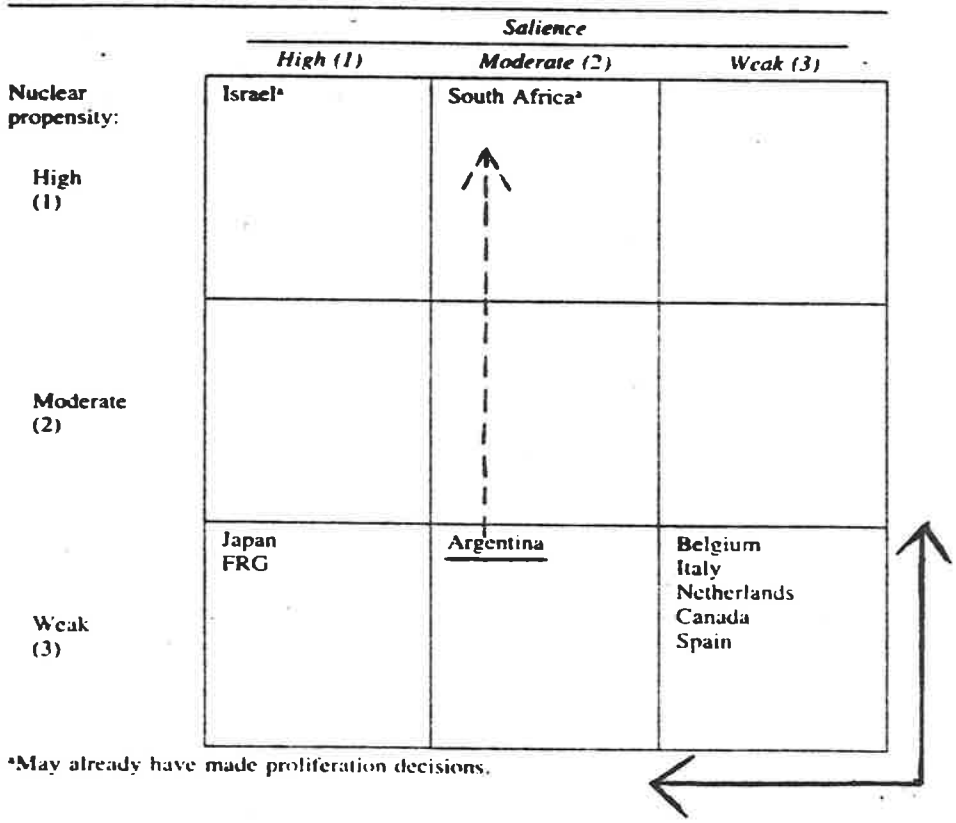
[a]1 = short lag time; 2 = moderate lag time; 3 = long lag time; 3+ = boundary lag time.

[b]1 = high; 2 = moderate; 3 = weak.

[c]May have made previous proliferation decision.

Table 2.2 Graphic Display of the Aggregate Risk Position of the Population at Risk

The Joint Distribution of the Population at Risk, Lag Time = Short (1)



[a]May already have made proliferation decisions.

Excerpted from: Meyer, Stephen M.,"A Statistical-Risk Model for Forecasting Nuclear Proliferation" in Brito, Dagobert(ed.),Strategies for Managing Nuclear Proliferation, Lexington, Mass.:

Table 2.2(cont.) Graphic Display of the Aggregate Risk Position of the Population at Risk

The Joint Distribution of the Population at Risk, Lag Time = Moderate (2)

Nuclear propensity:	*Salience* High (1)	Moderate (2)	Weak (3)
High (1)	Pakistan[a]		
Moderate (2)		Taiwan South Korea	
Weak (3)		GDR Brazil Yugoslavia	Switzerland Czechoslovakia Norway Sweden Austria

[a]May already have made proliferation decision.

The Joint Distribution of the Population at Risk, Lag Time = Long (3)

Nuclear propensity:	*Salience* High (1)	Moderate (2)	Weak (3)
High (1)	Iran[a] Libya[a] Iraq[a]	Algeria[a]	
Moderate (2)	Egypt	Nigeria[a]	
Weak (3)	N. Korea[a] Cuba[a]	Turkey Greece Mexico[a] Chile[a]	Australia Rumania Finland

[a]Boundary lag time.

Excerpted from: Meyer, Stephen M.,"A Statistical Risk Model for Forecasting Nuclear Proliferation" in Brito, Dagobert(ed.), Strategies for Managing Nuclear Proliferation, Lexington, Mass.: D.C. Heath and Co., 1983.

Other high risk nations from Table 2-2 which clearly demonstrate the proliferation drift are Taiwan, South Korea, Brazil, Japan, the FRG, Iran, Libya, and Iraq. A discussion of the proliferation subtleties of each member of the population at risk is beyond the scope of this research and, as mentioned previously, has been adequately reviewed elsewhere. For reference, however, a 1974 CIA National Intelligence Estimate analyzing the proliferation risk and potential of several NNWSs is included in this paper in Appendix 5. At this point, the particular cases of the highest aggregate risk proliferators of the population at risk merit further attention.

2.4b Highest risk proliferators: Israel, South Africa, Pakistan, Argentina

Israel and South Africa. According to my previously reformulated concept of nuclear proliferation, Israel and South Africa can possibly be denoted as NWSs by way of the mutual rumors and verified intelligence reports of covert testing, and/or manufacture of nuclear weapons. Israel and South Africa, the two clearest international pariahs, have long contemplated the nuclear option as the ultimate solution to the exogenous and endogenous problems confronting each regime. The dilemma of national survival of the Jewish nation has manifested into a "Masada complex" or "Samson's solution" (a suicide pact); similarly, reminiscent of the defensive battle encampments of the Boers, the Dutch-descended South African ruling class has contemplated a "nuclear laager" ultimate defense. Neither nation has signed the NPT, and both possess unsafeguarged nuclear research reactors as well as some sensitive nuclear reprocessing and/or enrichment facilities. Furthermore, according to several accounts Israel and South Africa, in conjunction with Taiwan, have created an informal "pariah" consortium - a basis for cooperation on nuclear weapons and civil nuclear energy matters.

For over a decade intermittent Israeli statements as well as foreign intelligence reports have suggested that Israel may already

possess an untested nuclear force. Several accounts during the 1973 Arab-Israeli war allege that Israel had even initiated a deployment of its nuclear forces prior to the Arab setback. Additionally, several leaked US intelligence reports during the 1970s ostensibly confirm this suspicion (Jacobson, 1982, pp. 94-95). Pursuant to South Africa, although reports of covert manufacture and deployment have been limited, apparently it may have attempted covert nuclear explosives tests on at least two occasions: once in 1977 in the Kalahari desert, which was aborted after a collaborative, preventive lobby by the US and USSR; and the controversial September 22, 1979 "detonation" in the South Atlantic, which was picked up by US satellite. Following an initial confirmation by US intelligence of its authenticity as a South African nuclear test in possible cooperation with Israel, a series of conflicting and contradictory statements from the various components of the US intelligence community only imperceptibly allayed suspicions and accusations (Jacobson, 1982, p. 95). Nonetheless, rumors of cooperative R&D on nuclear weapons between Israel and South Africa, along with Taiwan, exist.

Pakistan. Aside from Israel and South Africa, which by certain measures can already be considered NWSs, Pakistan is the next highest proliferation risk candidate. In the aftermath of the 1972 partition of Bangladesh and, most importantly, India's testing in 1974 of a "peaceful" nuclear device, Pakistan launched an assiduous attempt to develop a national nuclear weapons capacity under the leadership of Bhutto. A basic Pakistani precept identifies the existence of Christian, Jewish, Hindu, and Communist nuclear weapons to the exclusion of a Moslem equivalent (Palit and Namboodiri, 1979). Since Pakistan maintains aspirations to be the technological, military, and scientific vanguard of the Islamic world, it was assumedly natural for it to pursue a weapons capacity. A non-signatory of the NPT, Pakistan has obtained extensive civil nuclear technologies from France, but its most

monumental coup was the indigenous construction of enrichment facilities based on classified information filtered out of the Netherlands in 1972 by a Pakistani physicist, Dr. Abdul Kahn, who had been employed at a Dutch enrichment plant. Although the recent Pakistani leadership does not openly proclaim aspirations to NWS status as did their predecessors, the initiative has already gathered a self-propelling momentum. Reportedly, China is currently passing along sensitive nuclear technologies to Pakistan (BBC World Service, June 16, 1984). Furthermore, the US is attempting to appease Pakistan's nuclear avarice through the resumption of conventional military arms and supplies (BBC World Service, March 30, 1984). This tenacious Pakistani penchant for NWS status has, unfortunately, fed fuel to the nuclear weapons fire, causing an Indian reassessment of the necessity for actual assembly and possible deployment (Jacobson, 1982, p. 94).

Argentina. The latest priority proliferation risk is Argentina. Although the country has long been included in the population at risk owing to Argentina's semi-advanced civil nuclear energy industry, traditional rivalry with Brazil, regional status ambitions, and refusal to adhere to the NPT, its proliferation propensity was rather low. Argentina's inclination for acquiring nuclear weapons, however, has evidently compounded significantly due to the humiliating defeat during the Falkland Islands War, exacerbated relations with the US concerning favoritism and support during the conflict, and a diminishing international and national image due to the economic crisis and severe debt problems (Meyer, 1984). Discussions of the nuclear weapons route have been resurrected in Argentina, and the new civilian government certainly has been closely observing China's (a NWS) success in negotiating the relinquishment of another disputed British colony. Also, in the middle term, an Argentina with nuclear weapons leverage and status would fare better in the imminent, but still distant, scramble for Antarctica. It should be noted that Argentina's

adverse shift in nuclear propensity could also educe a change in Brazil's posture (possibly from weak to moderate nuclear propensity as indicated in Table 2-2).

2.4c Nuclear capabilities option and ambiguous capacity

The foregoing has applied to the highest risk nations of the population at risk either overtly or covertly aspiring to actual NWS status. However, a demonstrated nuclear weapons capability will not be the most prevalent norm for the spread of nuclear weapons. Assuming the continued existence and perceived utility of nuclear weapons, expanding numbers of nations will follow one of two proliferation routes. First, is the nuclear option, a kind of nuclear proliferation legerdemain disguising the true nature of the action - pressing for increased R&D in order to edge up to the nuclear threshold. A nuclear option can be considered a "capability decision" rather than a "proliferation decision" (Meyer, 1984, p.5). Second, is taking the capabilities option one step further and conducting limited nuclear tests or PNEs (ambiguous capacity). With a nuclear capabilities option or an ambiguous capacity, nations can derive many of the associated prestige and deterrent benefits of nuclear weapons without actual manufacture or deployment. Furthermore, with a capabilities option, contrasted to an ambiguous capacity, a state eludes most of the penalties and stigmas attached to demonstrated proliferation.

India, of course, is the only nation presently with an ambiguous capacity. Several other nations, though, such as Brazil have obstinately maintained insistence on their unfettered right to test PNEs. On the other hand, Israel and South Africa had both originally decided upon a nuclear capabilities option, from which they partially received the deterrent effects of nuclear weapons without openly proliferating (Feldman, 1982), but they may have consequently enacted proliferation decisions and entered the NWS ranks. Many of the countries in the population at risk now un-

doubtedly maintain contingency plans for emergency R&D, and manufacture of nuclear weapons which are triggered by certain crises. In the future, most of them will be compelled by the proliferation trends and unmitigated geo-political realities to pursue a threshold nuclear capabilities option or to conduct limited nuclear tests.

Sweden may have already made this capabilities decision (Meyer, 1984, p. 5). Likewise, Australia's announcement of their resolve to immediately manufacture nuclear weapons forces in response to a weapons development by any regional Asian or Pacific nation was commensurate to a capabilities option decision (BBC World Service, March 30, 1984). It would be very surprising if the military, governmental, and scientific elites of many of the nations of Western Europe are not progressively edging towards a nuclear capabilities option. Similarly, many advanced Third World countries may presently be in the process of executing a capabilities option or will do so in the future, especially given the relatively modest cost involved with the R&D of such an option (Smith, 1983; Graham, 1983) and the current wide dispersion of the requisite research and power reactors, trained scientific, nuclear engineers, nuclear materiel, etc. (Goheen, 1983, p. 213). Moreover, the pursuit of a nuclear weapons option can be used as a form of blackmail against the NWSs to receive more conventional arms transfers in exchange for foregoing open manufacture.

The cognizance is now setting in that the dissemination of capabilities options is the most inevitable medium term manifestation of proliferation and a phenomenon which demands expedient accomodation from the international community.* Winkler calls these trends toward nuclear ambiguity one of the most dangerous aspects of the 1980s (Winkler, 1982). Nevertheless, technical or political

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* (Marriane van Leeuwen, Nederlands Instituut voor Internationale Betrekkingen (NIIB), Clingendael - Interview on 19 September, 1984).

mechanisms can hardly arrest this trend, and, ostensibly, the diffusion of nuclear capabilities options is less deleterious than the open proliferation of nuclear weapons.

2.4d Interstate dynamics: chain reactions and regional weapons

The preceding sections have largely analyzed the proliferation trends of nations as isolated entities. But along with these individual trends to open, ambiguous, or capabilities option proliferation, two proclivities involving group or interstate dynamics deserve reflection namely: chain reactions of nuclear proliferation, and collaborative regional nuclear deterrent forces. The problem of nuclear chain reactions, otherwise known as the "Nth country problem" or "domino effect", is not discountable in the future after one or more nations, either party or non-party to the NPT, suddenly break the taboo; this situation depends intrinsically on the current world atmosphere at the time, the nature of the offending nations, and the extraneous incentives and pressures on the probable "dominos". Dunn provides a comprehensive list of the factors that could lead to runaway proliferation (Dunn, 1982, p. 68).

The phenomenon of chain reactions can be observed in the following progression: US - USSR - China - India - Pakistan(?) - Israel(?) - other Middle East proliferators(?). The latter potential proliferators may be inexorably educed to adopt a nuclear defense posture by the actions of the first "domino" though there may be no direct linkage between the two. The other most significant possible chain reaction initiators are Israel, Japan, the FRG, Argentina, Iran, Libya, Iraq, etc. Although this domino effect may be the most perplexing proliferation danger, alternative analyses indicate that the probability of its occurrence is slight or can be highly regulated (Weltman, 1981/82; Waltz, 1981). Further discussion will ensue in the following chapter.

In further regards to interstate dynamics, world regions, for either security or prestige motivations, could develop a regional nuclear arsenal. In this manner, the individual nations could avoid the economic burden and political stigma of shouldering the attainment solo, yet still reap the possible associated benefits. In the African and Arab regions, amongst certain radical sectors, promulgations in the past, as well as currently, have demanded the development of a black African (spearheaded by Nigeria and Zaire) or Islamic Arab (led by Pakistan, Egypt, Libya, or Iraq) bomb, respectively. Despite some rudimentary foundations of such cooperation in such instances as possible Libyan and Pakistani collaboration, the intricate political intrigue and barriers accompanying these or other such schemes diminishes the probability of these events in the medium term.

However, the most plausible eventuality of a regional nuclear arsenal may transpire in Europe. Ever since the US abandoned the idea of a NATO Multilateral Force (MLF) to share the command and control of nuclear weapons in the 1960s, the concept of an independent European Nuclear Force (ENF) has remained a vibrant point of debate. The INF deployment issue has engendered a revival of these considerations of the expediency of an ENF, and the recent 1984 rebirth of the long forgotten defense consortium, the West European Union (WEU), is symbolic of this dynamic. In one future scenario, therefore, a politically and economically unified or confederated Western Europe, via the European Community or the WEU, may eventually come under compulsion to build an independent ENF as NATO necessarily disintegrates and Europe withdraws from the US defense umbrella.

2.5 Nuclear Reliance

Along with these trends toward nuclear proliferation, a drift is discernible toward what can be termed "nuclear reliance" whereby many nations are now dependent on, or seeking some security or deterrence through, nuclear weapons. Nothwithstanding the fact

that the actual rate of demonstrated nuclear proliferation has not reached original anticipations, increases in the overall level of nuclear reliance have been more evident. This phenomenon is represented by demands for defense or deterrence against nuclear attack and increased dependence on nuclear weapons, in some respect or form, for ultimate national defense. The manifestations of nuclear reliance are: 1) demonstrated NWS status, 2) nuclear capabilities option or ambiguous capacity, 3) nuclear defense alliances, 4) bilateral nuclear security guarantees, 5) de facto or informal nuclear protection, and 6) positive defense guarantees embodied in the NPT. Although it is difficult to apply generalizations to such diverse tendencies, I maintain that they have sufficient common characteristics to warrant this categorization.

The first two manifestations of nuclear reliance - demonstrated NWS status, and nuclear capabilities option or ambiguous capacity - have been discussed in previous sections. Suffice it to say that these two aspects currently comprise only a small proportion of the nations integrally dependent on nuclear weapons for defense.

In lieu of a national nuclear weapons posture or a nuclear option, many nations have sought ultimate security through extended deterrence based on nuclear defense alliances and bilateral nuclear security guarantees. Many analysts contend that alliances and security guarantees can be an efficacious non-proliferation tool (Dunn, 1982; Lefever, 1979; Nye, 1980), but this policy also contributes to a heightened nuclear reliance, consequently also increasing the future nuclear propensity as a result of this dependency. NATO and the Warsaw Pact best exemplify nuclear defense alliances; other examples are the Australian, New Zealand, and United States mutual defense alliance (ANZUS), the Latin American and United States Treaty of Rio, and the near defunct South East Asia Treaty Organisation (SEATO). Additionally, many NNWSs have displayed interest in receiving bilateral (nuclear) security guarantees from the US or USSR, the most obvious cases being open US guarantees to Japan, South Korea, the Phillipines, and

Israel; and Soviet guarantees to Cuba, and Mongolia. Until 1982 when it joined NATO, Spain also had a long standing, bilateral US guarantee and at one point temporarily accepted stationing of US nuclear systems. Furthermore, other NNWSs have actively sought such protection. According to certain reports, the Soviet Union may have secretly extended nuclear security guarantees to several Arab nations (e.g. Syria, and Iraq) which will activate in the event of overt Israeli proliferation (Lellouche, 1982b, p. 77; Feldman, 1982).

Another manifestation of nuclear reliance is informal and de facto nuclear protection. Certain nations, lacking an official security guarantee, are reliant for their ultimate defense on informal security arrangements. The examples of South Africa, Taiwan, Vietnam, and until recently, Israel, most vividly come to mind. Similarly, other nominally non-aligned or neutral nations, due to their geographical position in the configuration of the East-West conflict, compute the mutual deterrent effect of the current superpower nuclear stalemate into their defense need calculations. Thus, nations such as Yugoslavia, Switzerland, Austria, Sweden, Finland, North Korea, etc. actually have de facto nuclear security pledges due to their strategic proximities to the flashpoint zones of the superpower struggle. Insofar as far as deterrence is stable and will not fail, the nuclear weapons equation is integral to the national defense computations of these neutral nations.

Lastly, the most sweeping example of this nuclear dependency is the positive security guarantee embodied in the addendum to the NPT, UN Security Council Resolution (SCR) 255. Responding to the security demands of the NNWSs, SCR 255 bound the US, USSR, and UK to come to the defense of any NNWS attacked, threatened, or blackmailed with nuclear weapons. In essence, this declaration amounts to a comprehensive, multilateral nuclear defense arrangement since, implicitly in a positive defense guarantee, the NWSs must resort to nuclear leverage to enact such

a defense. Although such positive security guarantees are unenforceable and non-binding in crisis situations, the fact that most NNWSs seek and are anxious to accept this guarantee evidences the extent to which nuclear reliance has taken root in the contemporary geo-political system.

These trends towards various manifestations of nuclear reliance exhibit the growing importance of nuclear weapons in national defense postures. Moreover, the disparate attempts by nations or regions to renounce dependence on, or association with, nuclear weapons have been feeble as exemplified by the failures and shortcomings of the concept of Nuclear Weapon Free Zones (NWFZ). The formation of an African NWFZ is obstructed by the nuclear posture of South Africa, the inflammable Middle East, concerns over technological advancement, and the promulgations in favor of a black African regional bomb. Similarly, a future South Asian NWFZ is pure fantasy given the actions of India and Pakistan. A Middle East NWFZ is likewise impeded by the Arab-Israeli conflict, superpower regional involvements, Israel's latent nuclear stance and the declarations by the Arab world of their intentions to mirror any Israeli development. The formation of insignificant NWFZs such as the recent announcement by the South Pacific Forum, a group of small Pacific islands, although meritorious in intentions, does little to reduce the drift to nuclear reliance.

Finally, the solitary example of a supposedly successful NWFZ, the Treaty of Tlateloco in Latin America, is fraught with contradictions, problems, and a lack of consensus which render the effort basically nonsensical. In this same vein, unilateral renunciations or declarations of nuclear neutrality are unlikely to be meaningful in the long term given the trends toward nuclear reliance and proliferation.

In conclusion, the continual existence and utility of nuclear weapons has coincided with the trends of nuclear reliance to pro-

duce a psychological "nuclear weapons conditioning" amongst the governments of both NWSs and NNWSs; this nuclear conditioning can be equated with "getting used to" or "learning to live with" nuclear weapons. As stated by one author, "the world has become accustomed to the nuclear forces of the original five." (Jones, 1984, pp. 1-2). It also assumes an inherent faith in the ability of nuclear weapons to provide deterrence and proscribe world, and certain regional, conflict.

2.6 Control and Minimization of Proliferation

Insofar as the future diffusion of nuclear weapons and capability options is to some extent unavoidable, prudent efforts must commence to prepare for the management and accomodation of the nuclear newcomers. Nevertheless, simultaneous endeavors to control and limit the phenomenon are mandated. Any discussion of venues to retard nuclear proliferation must focus on the associated incentives and possible sanctions rather than dwelling on the institutionalized, formal controls. Nuclear proliferation analysts have compiled a surfeit of theories of limitation (Dunn 1982, pp. 104-133; Epstein, 1976; 1977; Lester, 1982; Buchan, 1966; Weltman, 1981/82). Although most of these pertain to total proscription of future proliferation, they are equally applicable to minimizing its imminent occurrence.

Many of the standard tools for limiting horizontal nuclear proliferation deal with: strengthening the NPT while encouraging broader adherence, bolstering the IAEA safeguard inspections on civil nuclear industries and enforcing violation punishments, and assiduous NWS pursuit of arms control and disarmament. The inherent debilities and shortcomings of these approaches, however, have been expanded upon in earlier sections; regardless, there still exists certain means of minimization which could prove expedient in the future such as: 1) superpower coercion, promises, or threats; 2) defense alliances and security guarantees; 3) extended strategic Anti-Ballistic Missile Defense Systems (ABM); 4)

diluting prestige and status as proliferation motivations; and 5) internationalization of the nuclear fuel cycle. These will be summarily discussed.

Superpower actions. In his work, Superpower, Jonnson states, "The nuclear proliferation issue goes to the very heart of superpower status and "superpower politics"" (Jonsson, 1984). Thus, in order to arrest the spread of nuclear weapons and to perpetuate the international bipolar hierarchy, the superpowers can attempt, either individually or in concert, to control the expansion of new NWSs or nations with capabilities options. The superpowers unequivocally have powerful tools of persuasion and coercion at their disposal. Given the reality that "the central dilemma of nuclear exports and nonproliferation policy is basically the same for the United States and the Soviet Union" (Duffy, 1978, p. 108), both have adopted similar approaches.

At the genesis of a period of horizontal proliferation, the superpowers, along with the other NWSs, would attempt all means at their disposal to control the process including technology denial, promises, assurances, bribery, coercion, threat, and even military force. But superpower promises of nuclear energy technologies, or the denial thereof, is a stagnating asset due to the abundant number of nuclear suppliers (also Third Tier suppliers), and the highly competitive nature of the business. A more successful mechanism, however, is that of coercive sanctions, or military force. The US-Soviet collaborative prevention of the 1977 South African nuclear test, and their possible cooperation in preventing Israel from overtly deploying its nuclear warheads upon Jericho missiles during the 1973 Arab-Israeli war remain the prime examples of coercion as a means to limit proliferation. Similarly, in the future the superpowers may be tempted, either singly or in cooperation, to engage in preemptive, conventional or nuclear surgical strikes on the atomic research, production, or deployment sites of certain proliferation violators. The 1981 Israeli bombing of

the Iraqi "Osirak" research reactor, designed for military purposes, set a precedent for such operations. As an additional non-proliferation method the superpowers can continually enlighten the NNWSs of the disadvantages, dangers, and problems accompanying ascent to the nuclear club.

However, the most important superpower policy with which to stem the flow of proliferation is the provision of security guarantees, sub-divided into: 1) supply of conventional arms, and 2) negative and positive nuclear security guarantees. The reliable supply of conventional military supplies, in many cases, is a successful non-proliferation tool. Commonly known as the "doves dilemma" because of the assumed difficulties a pacifist would have in weighing the relative undesirability and dangers of conventional arms transfers vis-a-vis further nuclear proliferation, the fulfillment of the military requirements of certain states by the US, or threats of aid termination, has been of the utmost immediacy in precluding overt Israeli and Pakistani programs and similar developments in Taiwan, South Korea, etc.

The US and Soviet Union have been reluctant to extend "negative" nuclear security guarantees to NNWSs. Polemical and non-binding, these guarantees are essentially a pledge of "no first use". Conversely, they have in many cases given "positive" nuclear guarantees, assurances to use nuclear forces to defend a protectorate threatened with nuclear weapons. The superpowers have extended informal positive guarantees to all signatory nations of the NPT under SCR 255 and to a reticulate of defense alliances and security protectorates. Although this concept of extended deterrence compounds the nuclear reliance phenomenon, many analysts assert that positive security guarantees are the single most effective and indispensible non-proliferation instrument (Nye, 1980, p. 110; Lefever, 1979, pp. 134-135, 179; Dunn, 1982). Through extended deterrence in defense alliances and bilateral security guarantees (discussed in the previous section) the NWSs can, to an extent, satiate the defense requirements of their

"allies", thus permitting them to eschew the nuclear weapons route; furthermore, for their non-proliferation aims the NWSs can judiciously apply leverage on their protectorate as exhibited by South Korea's 1976 deferral of acquisition of a plutonium reprocessing plant, bowing under US pressure.

Formal positive security guarantees, unfortunately, entail several drawbacks. Firstly, they dictate integration of the security, military, diplomatic, and to a degree, foreign policies of the steward nations into those of their defense guarantor in order to insure a stable and trustworthy configuration. Furthermore, extended deterrence guarantees run the risk of failure - that protectors will not risk annihilation over a paper defense pledge. Conversely, security guarantees can function too well, dragging guarantors into conflicts caused by the reckless behavior of their protectorates. Nevertheless, extended deterrence through defense guarantees will remain paramount in the efforts to minimize proliferation.

Strategic defense initiative. A more futuristic possible means to limit nuclear proliferation is the strategic defense initiative (SDI) of the US and the equivalent Soviet venture. In the long term of 40-50 years strategic defense could be a reality. ABM systems, either of the standard nuclear or ultra-advanced laser and particle beam types, in theory could provide an effective defense against incoming offensive intercontinental ballistic missiles (ICBM) (see The Economist, Sept. 1, 1984). Notwithstanding the complexity of strategic defense systems, once organically integrated into the strategic balance they could further the conceivability of mutual deterrence, albeit along altered criteria, and plausibly be conducive to halting the offensive nuclear arms race and facilitating limited disarmament. However, unilateral or uneven development and implementation of these strategic defense systems could be very dangerous and destabilizing for the superpowers. The credibility of the concept of extended deterrence through security

guarantees can also be reinforced by the successful fruition of such initiatives.

Since ABM systems, especially the area-defense, space-based variant, would be readily retargetable, they could offer another future means to minimize proliferation.* The extension of superpower ABM systems to other NNWSs as part of security guarantees, or the creation of international regional networks could further eliminate incentives to proliferation by placating the ultimate defense requirements of additional NNWSs. In the future, superpower security pledges may consist of a combination of positive security guarantees of offensive action, and the offer of integration into an ABM defense network. Moreover, along these lines a world of rapid proliferation could conceivably spark the US and USSR into such an endeavor, incorporating their resources to achieve an effective defense against multitudes of nuclear newcomers. The likelihood, problems, and applications of these futuristic strategic defense initiatives will be elaborated upon in the final chapter.

Addressing prestige factors. Many authors (particularly Dunn, 1982) emphasize the preeminent role of the US in the evolution and maintenance of the non-proliferation regime. The ability of the NWSs, however, and particularly the US, to control proliferation may be waning; hence, a more international or multinational approach is warranted in many instances (Lellouche, 1979/80, p. 347). One possible international approach is to address the prestige factor as a proliferation motivation. The international system could possibly be altered so that prestige is disassociated with military or nuclear prowess and reestablished along other criteria. Through more benign channels and symbols, therefore, the proper

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* Interview with General G.C. Berkhof of the Netherlands Royal Army, and an associate of the NIIB, Clingendael, The Hague, on 17 October, 1984

bestowal of international recognition for economic, political, or developmental achievements is essential. The formation of a special status group of "near nuclear" nations to recognize the accomplishments of nations with a nuclear capability option could prevent certain overt ascensions to the NWS ranks. In essence, though, it would be only a fig leaf to partially conceal proliferation. Conversely, some students of nuclear proliferation have suggested the formation of an organization of Worldwide Non-Nuclear Weapons States designed to eliminate the NWSs prestige factor and to force nuclear disarmament.

Internationalization of fuel cycles. Promotion of the internationalization of nuclear fuel cycles may be the most important multinational non-proliferation instrument. The future spread of indigenously built reactors, and reprocessing, enrichment, and breeder facilities, although in itself a symbol of prestige, portends deleterious consequences for the world system since the fissile materials and spent fuels may remain under national regulation. Internationalization could facilitate non-proliferation efforts through promotion of once-through fuel cycles, the guarantee of reliable nuclear fuel supplies, and the international control, supervision, and disposal of all spent fuels. (See Jordan, 1979, p. 38; SIPRI, 1980; Meller, 1980). All enrichment and reprocessing would transpire in numerous regional facilities integrated into the international fuel cycle configuration. Some of the rudimentary mechanisms of such an arrangement can be observed in Comecon's Soviet-based, regional enrichment and reprocessing facilities for Eastern European nuclear fuel. Furthermore, internationalization would also resolve the inherent contradictions of the NPT: to prevent the spread of nuclear weapons while simultaneously advancing peaceful and civil nuclear energy for development (SIPRI, 1980).

The NWSs have tacitly supported internationalization proposals, but the actual realization of such a scheme is doubtful due to the associated impediments such as fierce opposition by several Third World nations (primarily Third Tier suppliers), and the

possibility that, as a result of the concomitant increases in world transport of nuclear fuels and wastes, particularly plutonium, the number of environmental disasters would dramatically escalate (such as the August 1984 incident involving the capsized Mont Louis, a nuclear fuel transport vessel, off the Belgium coast). Nevertheless, the option of internationalization of the nuclear fuel cycle must be perspicaciously studied and considered as a viable future alternative.

CHAPTER 3
THE STABILIZATION AND WORLD ORDER EFFECTS OF NUCLEAR WEAPONS AND NUCLEAR PROLIFERATION

The previous chapters established the framework for the probable future spread of nuclear weapons, at least to some extent and in certain manifestations. Assuming that nuclear proliferation is unavoidable and will become an increasingly important topic of international politics, discussions of the possible consequences, whether positive or negative, and its potential to provide a degree of conflict stabilization or pacification are necessary. Many writers do not approach the subject with a sufficient long term perspective and remain overly apocalyptic in their presentation (such as Beres, 1980). Similarly, some analysts, even those who concede the imminence of nuclear proliferation, counsel against contingency planning to accomodate recent proliferators due to what they perceive as the self-fulfilling nature of such overtures and to the hance of an accompanying shift away from a general non-proliferation mentality. I do not subscribe to these assertions. I am not an advocate of proliferation, however, and do not believe it should be condoned or tolerated merely as a means of reducing inequalities among nations or even for its possible conflict stabilization effects. But insofar as the present trends and actual realities testify that nuclear proliferation will be a feature of future international relations, studies must proceed to reveal ways in which the world can best cope with the spread of nuclear weapons. In this final chapter I will first present a discussion primarily of the pacification and conflict stabilization effects of nuclear weapons, and the dangers and possible benefits of nuclear proliferation. The burden of my analysis will be to address the relationship of nuclear proliferation to the development of world order and security.

3.1 Pacifying and Civilizing Effects of Nuclear Weapons

The paradox of nuclear weapons is that their very destructiveness and capacity to deliver annihilation is precisely what guarantees deterrence and renders nuclear war extremely unlikely. Although other factors such as economic interdependence and conventional balances also played a role, Mutually Assured Destruction (MAD), more accurately reconceptualized as MAS, Mutually Assured Self-restraint (van Benthem van den Bergh, 1983a), has for nearly forty years preserved world peace - if peace can be described as the absence of major conventional or nuclear conflicts - through assuring that the superpowers conduct themselves in a very restrained and prudent manner because any direct military confrontation could escalate into a nuclear exchange. The terror of Hiroshima and Nagasaki is not easily jettisoned from the consciousness of American and Soviet leaders.

In prenuclear military terminology the concept of deterrence referred to deterrence by an adversary's military strength, but in the nuclear age deterrence is based on a commonly perceived danger and a shared risk - that of nuclear destruction. In the theoretical perspective of Waltz, nuclear weapons have been one of the greatest world forces for good since WWII (Waltz, 1981). Mandelbaum also credits the deterrent effect of nuclear weapons for the incredibility of future nuclear war (Mandelbaum, 1983). Currently, there is no other clear alternative to reliance on this concept of deterrence, and according to van Benthem van den Bergh, "The MAS relation...is the least dangerous military strategic situation, given the impossibility to return to a nuclear free world." (van Benthem van den Berth, 1983a, p. 15). Additionally, the nuclear revolution has exerted a civilizing influence on world politics and nuclear weapons have acted as an "external constraint towards self restraint" (van Benthem van den Bergh, 1983b, p. 3).

Essentially, there are two opposing perspectives on the viability of nuclear deterrence:

1. Deterrence works because a nation can never be sure that an adversary will not retaliate.

2. Deterrence does not work because a nation must be absolutely convinced of the willingness and intentions of an adversary to retaliate or else an attack is invited.

These seemingly irreconciable views are rooted in the question of certainty or uncertainty of response, but, in actuality, it can be stated: certainty guarantees but uncertainty deters! In this light, the deterrent effect of nuclear weapons and of MAS have been broadened to also apply to the concept of extended deterrence, the defense of allies and protectorates. Not only do nuclear weapons reduce the potentiality of regional conflicts, but if a nuclear exchange was precipitated, the conflict would terminate very quickly for psychological reasons of crisis management (Luttwak, 1982, p. 47).

In conclusion in respect to deterrence, according to most pragmatic analysts of international relations, nuclear weapons should be viewed as absolute rather than relative weapons which retain their utility only in non-use. At this point it should be mentioned, however, that the future realization of effective ABM systems, and anti-aircraft and anti-submarine systems as a result of strategic defense initiatives and other defense developments could substantially alter the mutual deterrence context. Short of a comprehensive network, though, mutual deterrence would still remain intact, and the simultaneous realization of US and Soviet strategic defense reticulates could even strengthen deterrence. The following section will extend and extrapolate this nuclear weapons constraint and deterrence to apply to nuclear weapons proliferation, especially in conflict prone regions.

3.2 The Possible Benefits of Nuclear Proliferation

In the past, the proliferation of nuclear weapons was generally considered anathema to governmental sectors, opposition parties,

the public, and most analysts alike. Only two unconventional schools of thought espoused the virtues of independent, national nuclear forces: 1) Gallois - DeGaulle, and 2) radical Third World. The Gallois-DeGaulle line, popularized by the French military strategist and French President respectively, emphasized the development of national nuclear forces as the only viable option for nations to secure the mastery of their own destiny. This school of thought, originally advanced primarily in the context of the East-West struggle and as a rationale for the French nuclear "force de frappe", recognized that the nuclear era had evoked a drastic alteration in world politics whereby national possession of a nuclear retaliatory force rendered attack unfeasible; furthermore, it held that nuclear proliferation served to reduce inequalities, eliminate dependence, and guarantee autonomy of decision.

The radical Third World school of thought promulgated that proliferation is not inherently undesirable and is possibly even beneficial, especially in the developing countries, because of: firstly, security concerns such as the transplantation of mutual deterrence, similar to the MAD configuration, into the regional setting; and secondly, probelms of inequalities such as amelioration of imbalances in the status quo of the world system, an increase in the South's relative power position compared to the North, the curtailment of the great power arms race, and possible superpower disarmament (Mazrui, 1980, pp. 76-79).

These unconventional schools of thought, however, remained in disrepute; the prevailing belief in the uncalculable, malevolent dangers of nuclear proliferation remained unshaken among most parties. The usual anticipated denouement to the saga of nuclear proliferation was complex and intricate international relations (the ultimate in brinkmanship), increased superpower and regional rivalries and conflicts, mounting insecurity and paranoia, and the heightened possibility of Armageddon. The associated hazards have been thoroughly documented (see Dunn, 1982; Epstein, 1976; Beres, 1980; Jacobsen, 1982; Frei, 1982; van Benthem van den

Bergh, 1983b). The following list synthesizes the predominant dangers of proliferation:

1. Increased danger of world nuclear war between the present NWSs.

2. Increased mathematical probability of nuclear or conventional regional conflicts.

3. The possibility of nuclear chain reactions or the domino effect (discussed in the previous chapter).

4. Greater uncertainty and insecurity in international politics in respect to both NWSs and NNWSs.

5. Undermining of defense alliances and nuclear security guarantees.

6. The danger of a greater number of decision makers with access to weapons, or of a high leadership turnover in a new NWS, and the plausibility that some leaders will be irresponsible, reckless, irrational, or even insane.

7. The invitation of preemptive attack due to the impossibility of nuclear newcomers to manufacture and deploy invulnerable, retaliatory deterrent forces.

8. Inadequate development of reliable nuclear weapons' safety systems and C^3I to prevent nuclear incidents and accidents.

9. The risk of terrorist or non-territorial groups getting nuclear weapons.

Recently, there has been a breakdown of the near unanimity regarding the adverse consequences of proliferation as some studies have indicated that a world of multiple nuclear powers may be commensurate to a world of conflict stability, and a new line of theory has emerged among respected academicians which espouses a less fatalistic, utilitarian approach to nuclear proliferation. Led by Kenneth Waltz, author of The Spread of Nuclear Weapons: More May be Better, several non-conformist analysts have made bold, inquisitive advances into the future world of nuclear weapons dispersion (Waltz, 1981; 1983; Intriligator and Brito, 1978; 1981; Brito and Intriligator, 1983; Weltman, 1981/82; Quester, 1983; and

Bueno de Mesquita and Riker, 1982). These writers, along with several others, have bucked conventional philosophy and undertaken a reconaissance into the possible beneficial or benign effects of nuclear proliferation. To one extent or another, each of their analyses identifies potential advantages associated with the slow spread of nuclear weapons and rejects the totally malevolent views of proliferation.

However, these writers are often mistaken for open advocates of the nuclear proliferation process. Generally, realizing the future near inevitability of proliferation, they merely adopt a pragmatic and prudent, inquisitive approach to the problem in an attempt to reveal the possibility of the derivation of some benefits and accomodation. The theories of these analysts collectively constitute a strong rebuttal against many of the aforementioned dangers of nuclear proliferation and suggest other more appropriate policy alternatives with which to address the question.

First of all, limited nuclear proliferation will have little evident impact on the bipolar strategic balance of the superpowers or the likelihood of world conflagration. Waltz, for one, reached this conclusion by deducing expectations from the structure of the international political system and by inferring from past historical events (Waltz, 1981); and Intriligator and Brito, in their quantitative studies, concur with this premise (Intriligator and Brito, 1978; 1981; Brito and Intriligator, 1983). One writer even ventures to say regarding most NNWSs, "Nuclear acquisition by others can represent no more than strategic "pinpricks" to the superpowers." (Weltman, 1981/82, p. 187). In this light, neither amongst the developing or developed NNWSs is proliferation likely to inexorably lead to general world wide nuclear disaster as is so often asserted. Proliferation in the Third World will primarily affect only regional adversarial standoffs, and further ascensions of large, industrialized nations will, apart from possible exceptions such as West Germany, Japan, or a unified Europe, remain integrated into and subordinated to the bipolar superpower balance

(as occurred with the nuclear forces of France and Britain). Additionally, not only will proliferation fail to result in discontinuity in the intractable US-USSR nuclear balance, it may also actually increase world conflict stability due to the increased uncertainty imposed on all actors (Quester, 1983).

Furthermore, defense alliances and security guarantees, which are part of the overall bipolar configuration, could actually be strengthened by nuclear proliferation insofar as the US and USSR would seek to maintain the status quo in order to exert some leverage over the recent proliferators and to insure their integration into the strategic balance. New NWSs which are dependent on defense guarantees will also seek to perpetuate the arrangement in many instances (Waltz, 1981, p. 26).

Not only could proliferation have a benign effect on the current superpower strategic balance, but it could, under certain circumstances, also be conducive to a world wide general deterrence and the promotion of increased regional and global security. In essence, the spread of nuclear weapons could be beneficial if it duplicated the conditions of superpower mutual deterrence in other world regions such as the Middle East (Feldman, 1982), the Korean peninsula (Weinstein, 1981), and the Indian subcontinent. Based on the belief that nuclear weapons dramatically raise the stakes of potential conflicts and constrain governments to caution in their actions, many analysts support this hypothesis. The statement by Waltz, "Uncertainty about the course that a nuclear war might follow, along with the certainty that destruction can be immense, strongly inhibits the first use of nuclear weapons." (Waltz, 1981, p. 12), evidences his supposition of the salutary stabilizing effect at the regional and local level. Weltman concurs with the primacy of the uncertainty of success and the response of the other NWSs as the prime guarantee against regional conflicts as result of proliferation (Weltman, 1981/82).

Intriligator and Brito argue that an expansion of NWSs may not always be destabilizing and, in some instances, can veritably

reduce the probability of calculated nuclear attack or hostilities between belligerents, and in the regional setting the prudent, cautious behavior of mutual deterrence can be transplanted (Intriligator and Brito, 1978; 1981; Brito and Intriligator, 1983). Furthermore, each additional NWS provides an added restraining and stabilizing force on the other nuclear powers due to: 1) uncertainty over the possible reactions and behavior of each new proliferator, and 2) the relatively disadvantageous post war situation of an initiator in a world of a multiple number of NWSs. Although proliferation initially increases the risk of preemptive nuclear strikes, with a growing number of nuclear powers the probability of contemplated nuclear war will be reduced to virtual insignificance (Intriligator and Brito, 1978, p. 177; 1981, p. 256).

In another study Bueno de Mesquita and Riker reached similar conclusions: as the number of nations with nuclear weapons increases, the chance of bilateral regional nuclear conflict temporarily is heightened and then drops precipitously to zero after all nations are nuclear armed. (Bueno de Mesquita and Riker, 1982). Assuming nuclear proliferation is unavoidable and irreversible and that the probability of conflict is greater between a NWS and a NNWS than between two NWSs, they arrived at this hypothetical conclusion. Their work is also rooted in the merits of selective nuclear proliferation by the NWSs - the encouragement and assistance of proliferation of weapons, delivery systems, C^3I, etc. - in certain regions in order to enhance conflict stability through reduction of nuclear weapons inequalities and assymetries. (The concept of selective proliferation will be expanded upon in later sections.)

Quester also acknowledges that proliferation can exert a visible, positive impact in precluding regional conventional and nuclear encounters (Quester, 1983). In the context of the spread of nuclear weapons in the Third World, Weltman, who also believes that given enough time regional mutual deterrent postures will develop, asserts, "Weapons that constrain governments to restraint

in their use as a matter of self-interest have proven more effective than treaties that attempt to create common interests in reducing the likelihood of weapons use and the warbearing potential of crises" (Weltman, 1981/82, p. 144). Furthermore, rather than being disrupted by proliferation the East-West nuclear balance, along with the application of pressure from the US and USSR, would mediate and neutralize errant behavior in pairs of adversarial NWSs.

The words of van Benthem van den Bergh, pursuant to superpower mutual deterrence, can perhaps best summarily explain these theories of regional conflict stabilization based on minimum deterrence," "The crucial property of the nuclear age is that the risk that a nuclear war may come about, no matter how small, will always be infinitely more important than the possible gains of whatever military confrontation" (van Benthem van den Bergh, 1983a, p. 27).

The foregoing survey and discussion of certain analyst's views on the regional stabilizing effects of nuclear weapons proliferation assumes a slow and controlled dissemination and largely repudiates the possibility of nuclear chain reactions or the domino effect. According to Waltz, "It is not likely that nuclear weapons will spread with a speed that exceeds the ability of the new owners to adjust to them" (Waltz, 1981, p. 29); similarly, Weltman has called nuclear proliferation "self regulating" (Weltman, 1981/82). Thus, proliferation apparently has what can be termed a "terminal velocity", a point where further increases are unlikely due to continued constraints and disincentives, difficulties in adapting to changing circumstances, superpower leverage, and the finite number of regional standoffs or rivalries.

Likewise, the validity of the argument that proliferation increases the chances of nuclear conflict because some irresponsible, reckless, irrational or insane leaders may gain access to nuclear weapons can be challenged. Regarding irresponsibility and recklessness, the NNWSs have learned from the NWSs that there

can be security and prestige attached to nuclear weapons; hopefully, they will also assimilate the NWSs belief that these absolute weapons only have utility and extend prestige in non-use and in self-restraint. Furthermore, it cannot be assumed that totalitarian or authoritarian governments will act without caution since in most cases they show restraint in international relations, if not in domestic politics. Rationality, as another concern, is a relative conception and holds various meanings for different people or groups. Seemingly irrational leaders have often in the past shown constraint in crisis situations, based on an awareness of the costs and benefits, and are unlikely to use nuclear weapons irrationally, exhibiting a caution and awareness of the costs and risks (Waltz, 1981, p. 11). Reinforcingly, Weltman argues that the intentions and rhetoric of supposedly insane or irrational leaders must be distinguished from their choice of means (Weltman, 1981/82, p. 191). Another important point is that the decision to initiate a nuclear attack is not actually made by a single individual, and the power groups of most nations would not permit a permanently irrational or insane leader to adversely affect nuclear stability. Thus, in light of the above, new NWSs will probably only use nuclear weapons if their ultimate survival is at stake, and this is responsible and rational usage rather than the reverse.

The seemingly insurmountable difficulties of manufacturing and deploying invulnerable, retaliatory deterrent forces, reliable nuclear weapons safeguard systems, and C^3I; and the concomitant invitation of preemptive nuclear strikes and heightened possibility of nuclear accidents are also addressed by several analysts of the new line of proliferation theory. The conventional wisdom of nuclear proliferation holds that, "The history of strategic delivery systems repeats itself in different regional contexts, thus multiplying in the future the risks of strategic instability as it existed in the 1950s in major Power relations", (Frei, 1982, p. 170). Furthermore, the credibility and invulnerability of a nuclear force relies on the application of several modes of sufficiency including:

variation in delivery systems; numerical levels of warheads and delivery systems; mobility, hardening, dispersion, or concealment of delivery systems; the alertness of the military command (Feldman, 1982); and reliable nuclear weapons safeguard and C^3I systems (Frei, 1982, p. 170).

In response, Waltz has shown the ability of new NWSs, both small and medium sized, to manage, protect, and control nascent nuclear retaliatory forces and provide a credible deterrence (Waltz, 1981, pp. 13-21). Conversely, Intriligator and Brito, determining that proliferation lowers the probability of calculated attack, identify the risk of nuclear attack by accident, miscalculation, or mechanical failure due to faulty or insufficent weapons or C^3I systems as a priority concern. They advise a reorientation of superpower policy, therefore, away from a proscription of all proliferation towards the control and prevention of accidental nuclear war (Intriligator and Britσ, 1978, p. 179). Selective delivery to proliferators of safeguard and C^3I systems could partially address this problem (Intriligator and Brito, 1978; Bueno de Mesquita and Riker, 1982; Weltman, 1981/82).

Waltz has also demonstrated that there is a low probability of preventive or preemptive nuclear attacks against fledgling NWSs because of adversarial uncertainty of outcome (Waltz, 1981, pp. 14-16). Others have suggested that, with a limited number of NWSs, the risk of a preemptive surgical nuclear strike is initially high, but as the numbers of NWSs expand, the probability of such an action dwindles due to the possible response of the other NWSs (Intriligator and Brito, 1981); additionally, the practice of selective proliferation of nuclear warheads or delivery systems during certain crisis situations would diminish the incentives for preemptive strikes (Bueno de Mesquita and Riker, 1982; Weltman, 1981/82). It is important to note that even a low probability of a nuclear counter-attack is sufficient for deterring potential belligerents, so, in time, mutual deterrent postures between newly nuclearized adveraries will develop, especially given the increasing

availability of relatively cost efficient and defensible delivery systems such as the cruise missile and advanced fighter-bombers.

Summing up the possible beneficial or benign effects of nuclear proliferation on world politics, Stanley Hoffman has commented:

> "The spread of nuclear weapons strains (yet somehow preserves or engenders) alliances, exacerbates some existing hostilities while transforming others, and generalizes the kind of uneveness that has always provided world poltics with the dynamics of uncertainty, by establishing links (of enmity and collusion) between nuclear powers at varying stages of development." (Hoffman, 1966, p. 118).

Table 3.1 exhibits, in graphic form, a juxtaposition of the theories of five writers on the new school of thought vis-a-vis their treatment of the popularly acknowledged dangers of proliferation presented earlier. The table displays whether each theorist identifies beneficial, benign, or dangerous effects in these nine categories. Expectedly, the proponents of these theories have drawn considerable criticism and at times come under scathing attack from analysts who claim these hypotheses are meretricious, neglect or inadequately handle certain factors, and generally rest on tenuous grounds. The most commonly mentioned areas of weakness are in terms of: stable political systems, regional conflict stability, invulnerability, second-strike capability, accident-proofing, irrational or irresponsible usage, nuclear decapitation, and the down side risk of theoretical failure (nuclear war) (among others Dunn, 1982; Russett, 1983; Graham, 1983). One writer has even labeled these theories as "nuclear mythology" (Russett, 1983).

Nevertheless, if future nuclear proliferation is apparently inevitable, these kind of studies are necessary and useful. Attacking these theories from a too short-term of a perspective, ignoring future possibilities, is not constructive. Moreover, although these studies are necessarily abstract and do not pre-

Table 3.1 Survey of Analysts of the Benign or Beneficial Effects of Nuclear Proliferation

Standard dangers of Proliferation	Waltz, 1982, 1983	Intriligator & Brito, 1978 1981; Brito & Intril., 1983	Bueno de Mesquito and Riker 1982	Weltman 1981/82	Quester 1983
Superpower or world nuclear war	o	o		o	+
Nuclear or conventional regional conflict	+	x	x	+	+
Nuclear chain reaction	o			o	x
Greater uncertainty and insecurity	+	+	+	+	+
Undermined defense guarantees	o	x		x	x
Irrational, reckless, or insane leaders	o	-		o	-
Vulnerable nascent forces, and danger of preemption	+	-	+	+	
Inadequate safeguards and C³I, and danger of accidental war	o	-	+	+	
Risks of nuclear-armed terrorist groups			-		

Legend

+ : Beneficial effect
o : Benign effect
- : Dangerous effect
x : Varying effect

cisely mirror reality, they are useful in challenging the traditional belief of the totally malevolent nature of proliferation. These theories of the beneficial or benign aspects of nuclear spread also suggest important implications for the following section on the world order aspects of nuclear weaons and nuclear weapons proliferation.

3.3 Nuclear Weapons, Nuclear Proliferation and Future World Order

Supposing the continued existence of nuclear weapons, nuclear reliance, and some manifestation of nuclear weapons proliferation, the aim of this section is to analyze the possible consequences for world politics, specifically regarding alternative world security orders. In this light, the section will focus on: the procedures of world order design, isolation of a particularly relevant model, and the relationship of nuclear proliferation to this type of world order configuration.

3.3a Restructured world security order

The study of future world order and its attendant political, economic, diplomatic, security, and social balances is becoming increasingly popular among students of world politics interested in matters of global design (Beres, 1975, p. xii).

Two types of future world order research exist: design, and forecasting. Designing refers to attempts to visualize the future world order that is most desirable and to formulate a strategy to progress in this direction; forecasting seeks to isolate the most probable distant world image from a number of reasonable alternatives. The focus of this section lies on the concept of designing. It is also relevant to note, however, that most attempts to design or forecast future world orders have been hampered by the lack of a conception of a transition linking the present to the future and a tendency to invariably envision solutions as a replication on the global level of the system of authority manifest in

the current nation-state system (Falk, 1975, p. 200). World order design also entails either the transformation of the nature of man or the nature of states (Beres, 1975).

Numerous authors have expounded guidelines for research of world order alternatives; two significant writers are Beres and Soroos. The former has identified four stages of Planning Alternative World Futures: values, hypotheses, models, and recommendations (Beres, 1975, p. 52). The latter author has listed: 1) value specification, 2) analysis of the present and forecasting future developments, 3) formulation of designs of world futures, 4) evaluation of the designs, and 5) drafting transition strategies (Soroos, 1975, p. 12). This section will loosely follow a synthesis of these two procedures in approaching the discussion at hand.

The design and forecasting of alternative world orders of security has been a neglected academic field despite the calls by several writers for restructuring a branch of international relations into a newly conceived academic discipline of comparative systems of world order (e.g. Kahn, 1962, p. 351; Falk, 1975, p. 211). For the sake of analysis the assumption is made, at this point, that the most important value specifications of any design of alternative world orders are the political aspects, particularly survival and ultimate security, rooted in international self-restraint and the absence of nuclear war. In other words, the imposition of order on an otherwise anarchical international system. Disconcertingly, in this vein, owing to the hypothesis of the continued widespread acceptance of the nation-state system, the seeming permanency of international anarchy and self-help as characteristics of world politics (as described by Mandelbaum, 1983), and my conjecture of the tenacity of nuclear weapons deterrence doctrine, proliferation, and nuclear reliance trends, relatively little has been advanced on the world order aspects of nuclear weapons. Greater efforts in this sphere appear appropriate.

Another important hypothesis in any projection of future world security orders is the perpetuation, or conversely, disinte-

gration of the contemporary bipolar power configuration. Many analysts contend that the bipolar balance between East and West - centered around the US and the USSR, with its tenets of international anarchy, pursuit of equilibrium, and ordered hierarchy - cannot be replaced (e.g. Waltz, 1981; Dunn, 1982; Mandelbaum, 1977; van Benthem van den Bergh, 1983a; 1983b). Short of the development of a world government and the concomitant disintegration of the anarchic nation-state system, Mandelbaum suggests, in "International Stability and Nuclear Order", the continuation of the present bipolar nuclear regime that has served to minimize world conflict and hostilities and to proscribe nuclear conflagration as the most preferable world security order (see Mandelbaum, 1977, pp. 13-80).

More ingenuous models, accepting the value specifications and hypotheses mentiond above, have been devised by other authors. Adopting a long-term developmental perspective which builds upon the works of Norbert Elias, one such writer is van Benthem van den Bergh who has, in Nuclear Weapons and World Order, described a possible future world security order based on the premise that the restraining influence of nuclear weapons on the conduct of NWSs can develop into a "functional equivalent of the monopoly of violence of the state at an international level" which would durably pacify international relations (van Benthem van den Bergh, 1983b, p. 8). This pacifying and taming function would be achieved by limited cooperation - especially in terms of crisis management - by a cooperative consortium of nuclear oligopolists, presumably composed of a NWS roster not much different than the present grouping, which as such makes up the permanent members of the Security Council of the UN. However, to properly fulfill that function, the Security Council permanent members would have to be expanded to include such countries as India, Nigeria, Brazil, etc. The following paragraph summarily describes the nature of this world security order model somewhat further:

> "But the paradox of the nuclear revolution is that nuclear weapons, precisely because of the nearly apocalyptic threat they constitute, may yet begin to function as a substitute for a violence and power monopoly at the world level. That situation can eventually restrain the conduct of states without them having to transfer their sovereignty to a world government. What may emerge then is a form of "collective security" (through "international sheriffs") as conceived by President Roosevelt at the time of the Jalta meeting. But that will not be a great power condominium, dividing up the world in exclusionary spheres of influence or command as imagined in George Orwell's 1984. In terms of all other areas but the nuclear, and perhaps the military in general, in the economy, political and cultural spheres, the great powers will not derive many benefits from their oligopoly, as nuclear weapons cannot be used for positive political influence". (van Benthem van den Bergh, 1983b, pp. 10-11).

The logistics of this world security order require much consideration and attention. For this type of model of the taming of nuclear weapons and of NWSs to be achieved, the true function of nuclear weapons must clearly be understood by the national governments of all NWSs and NNWSs alike, and, furthermore, this knowledge must be imparted on their citizens to democratize the popular acceptance of this "utopia". Interestingly, at the 1968 Conference of Non-Nuclear Weapons States which paralleled NPT negotiations, one draft proposal urged for the creation of a multilateral instrument composed of the UN, the IAEA, and the NWSs, which would positively ensure the security of all NNWSs; the similarities with van Benthem van den Bergh's "nuclear oligopolists" postulate are striking.

Given a number of possible alternative future world security orders, this model appears as one of the least dangerous and most feasible. This thesis, therefore, is an attempt to design a future model of world security, imposing order on an anarchical system, by examining the unintended benefits of the existence of nuclear weapons. However, several formidable hindrances to the realization of such a durable pacification of international and regional conflicts by nuclear weapons as a monopoly of violence can be

identified: 1) traditional, outmoded strategic thinking, 2) continued political conflicts, 3) future technological breakthroughs, particularly in the area of ABM systems, and most in line with the theme of my paper, 4) the destabilization caused by nuclear weapons proliferation (van Benthem van den Bergh, 1983b, p. 10).

In respect to this last point, the structure of world order and international politics under a climate of multiple NWSs has not received sufficient attention. The next section will endeavor to expand upon the relationship of nuclear weapons proliferation to the consortium of "international sheriffs" or "nuclear oligopolists" model of future world security.

3.3b Nuclear proliferation and world order

Insofar as the spread of nuclear weapons, nuclear capabilities options, and nuclear reliance will most likely be features of future international relations, they obviously are an important consideration of any cogitations of future world security orders; this is particularly relevant to van Benthem van den Bergh's nuclear oligopolists model, which basically is rooted in the continuance of bipolarity. Since proliferation tends to undermine centralization and promote polycentrism, at first glance it may seem incompatible with the aforementioned world order thesis. This dichotomy can best be addressed by the example of another model of world order. The political scientist, Stanley Hoffman, earlier advanced a theory on a future world order based on several hierarchies of power such as military (nuclear), economic, resource strong, etc., which took into account the regional fragmentation effects of proliferation. Similar to van Benthem van den Bergh's nuclear oligopolists model, the paramount category verily is the military-nuclear hierarchy, a stage of harmony where all NWSs, including recent proliferators, cooperate as a "kind of board" managing conflict pacification and world stability (Hoffman, 1966, p. 120). Hoffman's world security order, however, is rooted in the belief that an international system of proliferation would not be bipolar

but multipolar. Thus, the question of regionalism and polycentrism must be placed in proper perspective.

My point of departure is that not only are the relationships and repercussions of nuclear proliferation important to any discussion of alternative world security orders, but it may even expediently facilitate and be deemed essential for certain models owing to the potential beneficial effects of the spread of nuclear weapons capabilities. Therefore, in the context of the nuclear oligopolists model, I will examine some particularly germane factors: 1) the expedition of the nuclear oligopolists postulate, 2) strategic defense initiatives, 3) the importance of an enlarged cooperative consortium of NWSs, 4) selective nuclear proliferation, and 5) an "eye for an eye" code of nuclear behavior.

Expedition of the nuclear oligopolists model. A world system of nuclear proliferation would, as mentioned previously, tend to be multipolar rather than bipolar. This conjecture holds true unless most new secondary NWSs fell into the orbit of one of the superpowers, eliciting a minimal effect on the world position of either or, more importantly, unless the US or USSR cooperate to perpetuate their hegemonic positions. In the future, it is possible that the superpowers, "enemy-partners", through the normal course of the development of world politics, adopt a collaborative approach to maintaining the bipolar nuclear balance and may eventually perceive their nuclear arsenals as a monopoly of violence at the international level. However, it is equally, if not more, realistic that a crisis could provide the catalyst to the pursuit of major structural changes in the world order. Some manifestations of this crisis trigger are: a limited nuclear exchange between the current NWSs, nuclear accidents, the rapid horizontal proliferation of nuclear weapons, and a small regional nuclear conflict as a result of nuclear spread (Kahn, 1962, p. 333; Dunn, 1982, pp. 168-175; van Benthem van den Bergh, 1983a, p. 37, 1983b, p. 10).

In regards to the latter two aforesaid manifestations, as insinuated previously, it is not discountable that the superpowers engage in preventive and accomodative damage limiting cooperation, working together against a commonly perceived threat, rather than becoming embroiled in the new international developments. In the future the precedents of US-USSR cooperation in monitoring and precluding South African nuclear explosive tests and in putatively preventing the Israeli 1973 deployment of their "bombs in the basement", in retrospect, may be perceived as the beating of distant drums. Thus, faced with a proliferating world or of further calculated regional nuclear attacks, the superpowers may be compeled to propose an alternative world order of the control of nuclear weapons by a world organization, or by a cooperative consortium of oligopolists (international sheriffs), a further step in the evolutionary process towards a monopoly of violence and power on an international level. An unintended possible outcome of proliferation, therefore, is an end to the arms race and a reduction of the risks of world nuclear war or regional conflicts. Indeed, this prospect is not wholly unrealistic if, through this collaborative action, the superpowers are able to arrest an otherwise uncontrollable escalation of horizontal proliferation - an occurrence of mutually extreme consternation.

Strategic defense initiatives. According to another scenario, faced with the aforementioned crisis situations, including the spread of nuclear weapons, the superpowers could be sparked into accelerating progress on comprehensive national ABM defense networks which could provide a broad protection from ICBM attack. A world of proliferation could even serve to induce the US and USSR to incorporate their resources to achieve an effective strategic "area defense" for themselves and their allies against the possible irrational actions of the nuclear newcomers. Discussion on these strategic defense initiatives has long persisted in certain esoteric circles, but the issue has been reenergized and brought into widespread debate by President Reagan's "Star Wars" defense

speech and more recently by the the 1984 US Presidental election debates. Although unilateral or disparate development, construction, and placement of these ABM systems, especially of the space-based variety, could be temporarily very dangerous and destabilizing for the superpowers, once organically integrated into the strategic balance, these futuristic systems could further the credibility of mutual deterrence, albeit along altered criteria, and provide a defense shield for military installations, C^3I infrastructures, and certain population centers against periphereal NWSs and stray ICBM's. In the long term either out of concerns of mutual deterrence or in the aftermath of proliferation, the attainment of preferential ABM area defense networks appears highly conceivable to some experts.*

Furthermore, as discussed in the second chapter, strategic area defense systems can also serve as a viable non-proliferation tool with which to guarantee the long-term viability of extended deterrence, appease the defense apprehensions of NNWSs, and eradicate certain security incentives to further proliferation. Either through unilateral extension of ABM area defense protection or the cooperative internationalization or regionalization of such systems, the superpowers could place most nations and regions under a strategic defensive umbrella.

However, future technological breakthroughs such as ABM systems is one of the factors identified earlier as endangering the future evolution of the nuclear oligopolists model of world security. In this light, the enormous complexities of the elaboration of a totally comprehensive ABM system, capable of repelling a massive adversarial attack, must be mentioned; the most notable difficulties are related to problems of identification, overwhelming, decoys,

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* (Interview with General G.C. Berkhof of the Netherlands Royal Army and an associate of the NIIB, Clingendael, The Hague, on 17 October, 1984).

electronic jamming, and logistical technical details. Additionally, strategic defense systems cannot provide protection against cruise missiles, stealth bombers, suitcase bombs, etc. These complications collectively represent a seemingly insurmountable barrier to the realization of a large scale impenetrable strategic defense. Thus, short of the accomplishment of a comprehensive venture, the tenets of MAD will remain intact, along with the possible durable pacification of international relations through nuclear weapons as a monopoly of violence.

Moreover, if the development of an all-embracing ABM reticulate did become a feasible reality as many analysts claim is possible, the US and the USSR could conceivably share or combine their technologies to preclude any destabilizing or dangerous imbalances or vulnerabilities. Strategic defense incentives, hence, could be integrated into a world security order, along the "international sheriffs" model, and assist in the pacification of international relations, though along different guidelines than originally conceived. Once advanced ABM systems are deployed, a world climate much more conducive to negotiating arms reductions may result.

Enlarged cooperative consortium of NWSs. Given the intensifying, discernible trends toward nuclear weapons proliferation and nuclear reliance, and the potential associated beneficial effects, the accomodation of an expanded number of NWSs may even be a fundamental requirement for the evolution and widespread acceptance of the nuclear oligopolists model of future world order rather than an obstacle as claimed by van Benthem van den Bergh. First of all, in order for this model to be workable, the ultimate security concerns of all nations must eventually be allayed by either a national nuclear deterrent, a regional nuclear deterrent, or an effective NWS security guarantee. As discussed in the previous chapter, the limited and controlled spread of nuclear weapons capabilities perceptibly enhances conflict avoidance and inter-

national power management. Thus, in certain intricate regional cases such as the Middle East, South Asia, etc., a mutual deterrence based on symmetrical national nuclear forces is more potent than threats or coercion by external NWSs. Moreover, in regards to the nuclear oligopolists scenario, in the regional context it is not preposterous to suspect that local nations, if given the option, would prefer integration into, reliance on, or pacification by, a regional nuclear force or local dominant NWS than the deterrents of distant international sheriffs. Lastly, the international or regional prestige and status aspirations of several more advanced or latently powerful Third World countries must be fulfilled for stability to reign in our hypothetical world order. Presumably, national nuclear forces or nuclear weapons capabilities options may be the only sound and durable approach to the problem.

Therefore, assuming that proliferation has a terminal velocity, van Benthem van den Bergh's model of nuclear weapons as a substitute of the monopoly of violence of the state at an international level may require not only "international sheriffs" (the current NWSs), but also the institution of certain regional spheres of nuclear deterrence manifested in regional "international deputies", medium and some small nuclear powers such as India, Nigeria, Argentina, Australia, etc. However, the US and USSR would maintain dominance in such a configuration, their immense nuclear might, and the tenacious strategic balance acting to subordinate the periphereal NWSs and to induce compliance to the objectives of the world order. The superpowers along with the other NWSs could also engage in what can be termed "nuclear orientation", educating the new NWSs (international deputies) of the most effective methods of nuclear management, mutual deterrence, and prevention of nuclear accidents and incidents based on their past experiences in "writing the ground rules" for the nuclear deterrence game. (For example, see Jones' discussion of nuclear crisis mangement (Jones, 1984, pp.252-255).)

With balance of power, collective security, and conflict pacification as the most fundamental aspects, such a future world security order, characterized by nuclear regionalism and the placation of regional security and prestige demands through an enlarged number of nuclear oligopolists, could correspond to Cline's divisions in his work, World Power Assessment, in which he described eleven politectonic regional zones of ascendancy (see Cline, 1975). North America, Eastern Europe and the Soviet Union, and China are the natural preponderant divisions, with Western Europe following. (For a discussion of alternatives for European unity or confederation under such an international hierarchy see Spiegel, 1972.) The periphereal world regional zones such as East Asia, South America, southern Africa, etc.) would function as "junior partners" in the nuclear weapons consortium.

This model of nuclear regionalism or regionalistic, oligopoly control of violence at the international level could conceivably correspond to the administration of regional civil atomic energy facilities under an International Fuel Cycle arrangement. In this instance, all nations would depend on the nuclear deterrent forces, as well as nuclear enrichment and reprocessing facilities, of the "international deputies". Similarly to the previous discussion, as undesirable as it may seem, the catalyst for such a world security order may come from an international crisis such as the proliferation domino effect, nuclear accidents, or a limited nuclear exchange by the superpowers or by fledgling NWSs.

Selective nuclear proliferation. Another pertinent aspect in terms of horizontal nuclear proliferation vis-a-vis the nuclear oligopolists model of future world security is selective nuclear proliferation. The theory of selective nuclear proliferation rests on the premise that in most situations the danger of conflict is greater between a NWS and a NNWS than between two NWSs; in the event of unavoidable proliferation, therefore, a greater number of conflict prone nations achieving the capability simultaneously would present

an increased ratio of nuclear standoffs and thus obviate risks of a nuclear confrontation. The existing NWSs would facilitate this process in a crisis situation by, either unilaterally or in concert, attempting to remove imbalances in nuclear forces and minimize the risk of regional conflagrations and preemptive attack by selectively supplying militarily insecure nations with the nuclear means to counter their adversarial power. In essence, the dangers of assymmetries in nuclear weapons capabilities may be greater than the risk of expanded ranks of NWSs. The perils caused by gross imbalances in military capabilities is evinced in the case of the war between Iran and Iraq. Iraqi chemical warfare against Iran, which possessed no comparable chemical or biological weapons capacity, demonstrates the possible use of horrendous weapons of war if an unambiguous disparity exists with no effective defense guarantee or faculty for commensurate retaliation. In addition to the above, the self-interested selective proliferation of certain weapons safeguards, and C^3I systems to nascent NWSs could expediently diminish the hazards of nuclear war by accident or miscalculation.

Several analysts have espoused the possible virtues of the selective transfer of delivery vehicles and warheads, and/or command and control systems as a plausible future alternative in the event of the dispersion of nuclear weapons forces or weapons options (e.g Wentz, 1968; Weltman 1981/82; Intriligator and Brito, 1978; 1981). Bueno de Mesquita and Riker, who believe technical approaches and political and institutional disincentives to the obstruction of proliferation will eventually fail, have provided one of the most competent studies based on the Prisoner's Dilemma game and historical evidence supporting nuclear deterrence. Although not exhorting an overall policy favoring proliferation, they suggest the transfer of nuclear weapons systems and technologies, in certain circumstances, as a viable policy reformulation (Bueno de Mesquita and Riker, 1982). One major drawback of this scheme, of course, is that nations are indirectly invited to actuate a small scale indigenous weapons program in the hopes of receiving

superior technology transfers from the NWSs who will be attempting to prevent imbalances (Weltman, 1981/82). Furthermore, this utilitarian approach has the potential to be extremely dangerous if not handled properly.

In regards to future world alternatives, this concept of selective proliferation may be integral to the development of the nuclear oligopolists world order thesis characterized by central and peripheral zones of nuclear weapons as a monopoly of violence (nuclear regionalism). Thus, in order to maintain conflict stability and address the security and prestige requirements of certain nations and regional groups, the international sheriffs may be compelled to act together to employ selective proliferation to these international deputies as a means to realize the objective of world security under the new world order. This concept requires extensive future study.

Code of nuclear behavior. Herman Kahn once suggested banning the first use of nuclear weapons through the institution of an "eye for an eye" code of nuclear behavior whereby the superpowers would be responsible for delivering commensurate retaliation against any initiator of a nuclear conflict (Dunn, 1982, pp. 168-170). The implementation of such a code of nuclear conduct, not regarding the actual plausibility of such a scheme, would go far in alleviating motivations to a nuclear strike, as well as reducing the insecurity of NNWSs. Thus, a code of nuclear behavior, if credible, would drastically reduce incentives to proliferation.

Other analysts have suggested similar proposals to deter the use of nuclear weapons, preserve deterrence, and prevent proliferation which entail the transfer of nuclear weapons. Frye has advocated a plan whereby all NWSs, jointly or individually, would guarantee that any NNWS subjected to nuclear attack or aggression would be provided with immediate access to nuclear weapons systems to deliver a retaliation in kind (Frye, 1976). Garwin has proposed a similar, though more feasible, plan; the NWSs would

designate a certain section of their arsenals to be controlled by international or multinational groups for the specific purpose of providing protection or commensurate retribution for any NNWS subjected to aggression involving nuclear weapons (Garwin, 1977, pp. 131-132).

Such unorthodox theoretical proposals could, if enacted, prohibit nations from precipitating a nuclear attack under any circumstances or conditions. Thus, some manifestation of these "tit for tat" codes of nuclear behavior, which may involve the functional equivalent of the concept of selective proliferation, have the potential to elicit the durable pacification of international relations and the taming of nuclear weapons and the NWSs, the primary precept of the nuclear oligopolists thesis of world order. Indeed, such a plan may be an inherently essential component of this model; "international sheriffs" or regional "international deputies" would guarantee proportional retaliation against a nuclear conflict initiator or, conversely, would furnish "lynch mob" nuclear retaliatory forces to any NNWS subjected to such aggression. However, such actions are not intended to be carried out and it is their threat which would restrict deviations from acceptable international behavior. Thus, nuclear weapons as a monopoly of violence would eventually pacify all potential conflicts and, as stated in the context of codes of nuclear behavior, "Once acquired, the sole purpose of nuclear weapons would be to deter the use of other nuclear weapons." (Dunn, 1975, p. 160). Furthermore, a no first use code of nuclear conduct would substantially reduce proliferation propensities through assuaging the security requirements of NNWSs and eliminating many of the existing proliferation motivations.

However, the obstacles to the adoption and implementation of an "eye for an eye" code of nuclear behavior are formidable, the most paramount difficulties being: the continuation of superpower competition, clashes of NWS interest, the question of retaliation against an ally, contradictory inherent political values, the de-

termination of commensurate retaliation, the possibility of reprisal counter-deterrence by the initator, and, most importantly, the ethical and moral considerations of tit for tat retaliations (see Dunn, 1979, pp. 161-163). These obstacles and constraints ostensibly collectively indicate the unfeasibility of such an attempt to pacify world politics. However, as discussed previously, after the hypothetical future occurrence of one of a number of nuclear crises, the world may be more receptive to measures to preclude further cases of such incidents; thus, the NWSs as well as NNWSs may voluntarily collude in the formulation and acceptance of a code of nuclear behavior which prevents further use of nuclear weapons and forestalls the necessity of the dispersion of nuclear weapons. These propositions of codes of nuclear conduct - as with the other previously discussed speculative proposals related to nuclear weapons, nuclear proliferation, and world security order such as selective proliferation, and strategic defense initiatives - deserve much further careful study and reflection.

SUMMARY AND CONCLUSIONS

The uncontrolled proliferation of nuclear weapons is now re-emerging as a predominant concern of both nuclear weapon states (NWSs) and most non-nuclear weapon states (NNWSs), and as a priority item of international relations. Since the genesis of the nuclear era the world has witnessed the actual ascension of only six nations to the nuclear weapons ranks, the US, USSR, UK, France, China, and India, owing at least partially to the elaborate non-proliferation regime devised by the NWSs and the other suppliers of nuclear materiel and technologies. The Nuclear Non-Proliferation Treaty (NPT) is the centerpiece of this regime.

Through the 1970s and 1980s, developments in the world system and the emergence of certain realities have indicated that the current proliferation context may be drastically altered in the future. Most significant are the realizations of the continued existence of nuclear weapons and the anarchic world system, characterized by the absence of formal order and by reliance on self-help for security. As a result, there have been increasing world tendencies toward nuclear proliferation and growing aspirations to attain nuclear weapons status or a weapons capability, primarily for reasons of security and prestige. Out of the population at risk, the group possessing the technial capability to manufacture nuclear weapons and considered the most feasible future proliferators, this is most vividly evidenced by the current nuclear posture of Israel and South Africa, the probable short term ascent of Pakistan to the elite nuclear weapons club, and Argentina's shift from a low to a high nuclear propensity as a result of several domestic and international problems. The most common future path to proliferation, however, will be through the nuclear capabilities option - pursuing a weapons program to the threshold of a demonstrated capacity. In this light, a reconceptualization or clarification of proliferation and of a nuclear weapons state, which more adequately conforms to contemporary trends, must be formulated.

Along with the trends toward actual weapons proliferation, a drift toward "nuclear reliance" can be discerned. Thus, in lieu of a national weapons capability, many countries are now dependent on, or seeking some security or deterrence through, nuclear weapons. This phenomenon is manifested most clearly in demonstrated NWS status, nuclear defense alliances, bilateral nuclear security guarantees, the development of a nuclear weapons option (near nuclear), de facto or informal nuclear protection, and, most sweepingly, by the positive defense guarantees embodied in the NPT. This phenomenon is also reinforced by a type of "nuclear weapons conditioning", a psychological attitude that can be equated with "getting used to" or "learning to live with" nuclear weapons and their latent promise for deterrence, stability, and reduced world conflict.

These prolivities toward various forms of proliferation and essential nuclear reliance have also been fueled by several contemporary factors influencing the future probability of proliferation. For one, there is an organic connection between the ongoing development of civil nuclear energy and the application of nuclear technologies to military purposes in both developed and developing countries, particularly given the possibilities of future widespread use of new sensitive "proliferation prone" nuclear power technologies (i.e. uranium enrichment and reprocessing, and breeder reactors) in a plutonium economy. Secondly, there is a link between future proliferation and the disarmament efforts of the current NWSs. It is structurally extremely difficult, if not actually undesirable, for NWSs to achieve the type of limitations on vertical proliferation (superpower arms race) as the NNWSs demand; therefore, the great powers have drawn scathing criticism in their disarmament efforts. This, in essence, also lends a further legitimacy to the "bomb". A third factor is the numerous inherent weaknesses of the NPT which have emerged, suggesting grim implications for the future of this non-proliferation device. Lastly, the technical, economic, and political constraints against proliferation have been eroding steadily.

Thus, partially on the basis of these factors the conclusion has been reached that the future horizontal spread of nuclear weapons is almost axiomatic, only the extent and pace are still undetermined. However, the expansion of NWSs will not be an uncontrolled dynamic process because of continued disincentives and efforts by the present NWSs and other international efforts to constrain and discourage the nuclear "domino effect"; nonetheless, the future proliferation of nuclear weapons and the continued strengthening of nuclear reliance appear inevitable.

This occurrence could produce increased superpower and regional rivalries and conflicts, mounting insecurity, and the heightened possibility of a nuclear Armageddon. On the other hand, it is also possible that a world of multiple NWSs is tantamount to a world of stable, pacified international relations and reduced conflicts. This hypothesis is based on three assumptions:

1) the imminence of nuclear proliferation and the need to accomodate newcomers,

2) that nuclear weapons have a potential taming or pacifying effect which is responsible for the self-restraint evidenced by the actions of the current NWSs and which will not be easily undermined by proliferation, and

3) contrary to the conventional belief, nuclear proliferation may elicit several beneficial or benign effects on international relations.

This latter assumption, espoused by several analysts of a new line of thought concerning proliferation, is rooted in the premise that the danger of war is greater between a NWS and a NNWS than between two NWSs; therefore, an increased ratio of nuclear stand-offs, especially in conflict prone regions, could minimize the dangers of conventional or nuclear confrontation. It certainly must be realized that there may be many risks associated with the proliferation of nuclear weapons but there could be even greater dangers from rigid opposition in the face of the unavoidable. Thus, the future international system will have to accomodate a multiple number of NWSs.

Assuming that nuclear weapons have in the past, and will in the future, elicit a "constraint towards self-restraint" on nations and regional groupings in international relations, and that the nuclear weapons genie cannot be "wished away" or stuffed back into the bottle, it is increasingly evident that nuclear weapons could evolve into a substitute for the monopoly of violence and power of the state at an international level. (van Benthem van den Berth, 1983b). In the context of this "nuclear oligopolists" model of world order, considerations of nuclear proliferation and nuclear reliance are intrinsically important, especially in their impact on educing or even facilitating an alternative international system for the maintenance of world peace, short of a world government, through a cooperative consortium of "international sheriffs".

Reflections on the relationship of a world security order and nuclear proliferation to speculative future proposals such as selective proliferation, international fuel cycle arrangements, strategic defense initiatives, code of nuclear behavior, etc. are essential and merit further careful study. In any case, it is highly likely that a larger number of NWSs and the institution of certain regional spheres of nuclear deterrence, manifested in regional "international deputies", must be accomodated into a new world order of politico-military security based on nuclear weapons as a monopoly of international violence. The possible unintended outcomes of increased proliferation and nuclear reliance, therefore, are an end to the arms race and a reduction of the perils of world nuclear war or regional conflicts.

Returning to considerations of the present, given the increasing world tendencies toward nuclear weapons proliferation and nuclear reliance, the continued residual views of the social and economic benefits of uninhibited access to all civilian nuclear energy technologies, Third World disatisfaction with superpower disarmament efforts, the inherent weaknesses of the NPT, and the erosion of non-proliferation constraints, the forthcoming 1985 NPT

Review Conference may prove a crucial juncture for the current non-proliferation regime, one which could portend the future collapse of the sytem. Perhaps the 1995 NPT expiration date?

Primary Conclusions

I have arrived at three primary conclusions based on my research into the contemporary issues influencing nuclear proliferation, the current system of international politics, future nuclear proliferation trends, and the conflict stabilization and world order effects of nuclear weapons and nuclear proliferation. They can be identified as follows:

1) Based on the current trends in world technological advancements, the continued attractiveness of civil nuclear energy and new sensitive facilities, the characteristics of the present world political system, dissatisfaction with the performance of the existing non-proliferation regime, perpetual international tensions, and possible recent entries into the nuclear club, a future increase in nuclear proliferation or dependence on nuclear weapons deterrence appears unavoidable.

2) The imminent proliferation of nuclear weapons and the compounding of nuclear reliance could exert a stabilizing effect on international and regional conflicts; however, it will inherently necessitate drastic transformations of the current world political order to, in a utilitarian manner, accomodate the nuclear newcomers and institutionalize nuclear weapons and nuclear regionalism as the binding forces of a new alternative world security order based on nuclear weapons as a monopoly of violence at the international level.

3) Since little has been done since the 1980 NPT Review Conference to address the questions and complaints of NNWSs, primarily the Third World, concerning the provisions of the treaty, the impending fall 1985 Review Conference, in all probability, will once again be the scene of severe grievances, unresolvable disputes, scathing attacks on the NWSs, and seemingly insurmountable obstacles. However, there will be certain changes in emphasis from previous gatherings. Consequently, the conference could witness the actual or threatened withdrawal of several current signatories, possibly portending the demise of the present non-proliferation regime.

ADDENDUM
PROSPECTS FOR THE FORTHCOMING 1985 NPT REVIEW CONFERENCE

The Third Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons will be held at Geneva, Switzerland, in the Fall of 1985 with the primary purpose of assuring that the objectives and provisions of the NPT are being realized. Since the inception of the NPT in 1970, two similar review conferences have been held at Geneva, the first in 1975 and the second in 1980. The 1975 Review Conferences adopted a final consensus which reaffirmed the objective of the NPT as well as the commitments of the signatories. The 1980 Review Conference, however, was uanble to adopt a final consensus declaration, primarily due to disputes over certain implementation of its provisions. The Conference did, though, reconfirm the view that the NPT retained its viability as a useful tool in efforts to prevent the spread of nuclear weapons.

But the proceedings of both past Review Conferences, were conducted under an aura of negativism, misunderstanding, and dissatisfaction, especially persuant to alleged superpower insensitivity to the demands and needs of the NNWSs and the entire world community concerning the peaceful benefits of nuclear energy, superpower disarmament, and failure of the Comprehensive Test Ban Treaty negotiations. Epstein has stated regarding the 1975 Conference: "the actions of the two superpowers seemed almost deliberately calculated to anger the Third World countries without heed as to whether this might do danger to the NPT". (Epstein, 1976, p. 253). Since the NWSs have retained a veto power at the NPT Review Conferences, the NNWS's numerous proposed amendments to the Treaty were defeated because of superpower opposition. Still the overwhelming majority of the signatories did not question the foundations of the NPT but only criticized the failures of its provisions.

Given the increasing world tendencies toward nuclear weapons proliferation, the residual views of the social and economic benefits of easy access to all civil nuclear energy technologies and facilities, Third World dissatisfaction with superpower disarmament efforts, and the inherent weaknesses of the NPT, the forthcoming 1985 NPT Review Conference could once again witness extreme disagreement and discordance.

Almost certainly, divergent views will exist amongst various groups over the objectives of the Conference, the future implementation of the treaty, and the future need to strengthen certain aspects of the NPT. The NWSs, as well as several other of the nuclear suppliers, generally favor the status quo and will most likely only emphasize the continued link between the civil and military uses of nuclear energy and urge strengthened and broadened safeguards on civil nuclear facilities and sanctions against violators. They will also push for wider adherence and ratification of the NPT.

Conversely, the majority of the NNWSs, spearheaded by the "Group of 77" and the Non-Aligned Movement, will strive to consolidate their position in order to make a critical examination of the NPT's precepts, and the fulfillment thereof, and to remedy any evident deficiencies. As at past Review Conferences the demands of the NNWSs can be expected to center around three themes: 1) the development of peaceful nuclear energy, 2) superpower arms control and disarmament, and 3) security guarantees. The NNWSs in all likelihood will once again stress the importance of eliminating the Treaty's inherent discrimination.

In the past the paramount issue for most NNWSs was the peaceful development of atomic energy. The common perception was that the NWSs and other nuclear suppliers had reneged on their pledges to promote civil nuclear energy to its fullest extent for the signatories of the NPT and were, in actuality, extending preferential treatment in nuclear materials and technology to non-parties. But because the ambitious future plans for nuclear

energy in most nations have been considerably scaled back in recent years, at least for the short and medium term, this concern should assume relatively less precedence at the 1985 Conference.

However, it can be suspected that the nuclear suppliers, and particularly the US, will be blamed for the current depressed state of the nuclear energy industry and that there will be continued calls for preferential treatment for NPT ratificants, especially Third World countries. Most of these statements, of course, will be only traditional rhetoric.

What should emerge as the predominant topic of the debate in 1985 is the issue of superpower commitments to disarmament. Most NNWSs view vertical proliferation (the superpower arms race) as being organically linked to horizontal proliferation, so they consider disarmament vital. At the original NPT negotiations in 1968, the Minister of State for Foreign Affairs of the United Kingdom, Fred Mulley, stated, persuant to the sending debate over disarmament, "We are all given five years notice - the two major nuclear powers particularly - to produce real progress towards a better and saner world." (United Nations, 1968, p. 6). This progress was not realized by 1975 however, certainly less by 1980, and the current impasse in all arms control negotiations could be the dismal low point in this pursuit. This, disarmament could emerge as the primary topic of debate in 1985.

Reinforcing this, recent events indicate that neither superpower, nor the other NWSs, is anxious to assuage the disarmament and arms control demands of the NNWSs. These events and occurences, which will also be points of discussion themselves at the 1985 Conference, include:

1. The 1983 Soviet walkout of all arms control talks and the current comprehensive arms control quandary.

2. The US refusal to relinquish its "first use" policy.

3. The Soviet repudiation of US offers to return to negotiations which combine all types and categories of nuclear weapons, both offensive and defensive, and including space based (BBC World Service, 1 July, 1984).

4. The announcement that the US, breaking with past nuclear test policies, has been concealing an undisclosed number of nuclear explosions.

5. The refusal of France and China to sign the Limited Test Ban Treaty and France's announcement that it will continue openly testing in the Pacific atolls until at least the year 2000 (BBC World Service, 4 October, 1984). (At the United Nations, France has come under scathing criticism for these practices, particularly from the South Pacific Forum (BBC World Service, 11 October, 1984)).

6. The refusal of the US to renew efforts to ratify the already negotiated Threshhold Test Ban Treaty (TTBT) and the Peaceful Nuclear Explosions Treaty (PNET).

7. The Reagan Administration's apparent lack of interest and disregard in resuming negotiations on the Comprehensive Test-Ban Treaty (CTB).

8. The attempts by both the US and USSR to extend the arms race into space with new Anti-Satellite (ASAT) and Anti-Ballistic Missile (ABM) systems.

Thus, because of specific instances such as the above, and the unlikelihood of meaningful disarmament in the foreseeable future due to superpower problems and constraints (discussed in Chapter 1), the issue of disarmament should supplant the development of peaceful nuclear energy as the priority item on the agenda.

The issue of NWS security guarantees for NNWSs, either positive "activist" or negative "pacifist", may assume a relatively greater urgency. Most NNWSs have been disconcerted with the credibility of past security pledges through the NPT and have been clamoring for more viable guarantees. The US refusal to adopt a negative "no first use" posture will reinforce these apprehensions. In essence, these increased demands for reliabale security guarantees further compound the existence of the phenomenon of nuclear reliance (Chapter 2).

Another emerging topic at the 1985 Conference could be that of full adherence to the obligation to refrain from the manufacture or purchase of nuclear weapons. Therefore, the question of

ambiguous proliferation will be important, and countries such as Israel and South Africa, suspected proliferators, could be subjected to an overwhelming round of condemnation. (Israel will also most likely be censured by most NNWSs, primarily the Third World, for its 1981 preventive bombing of Iraq's Osirak nuclear research reactor). Many NNWSs and NWSs are now becoming increasingly concerned that the provisions of the NPT are not adequate to arrest the drift toward open proliferation or to a weapons capability option. In regard to the latter, the NPT in no way restricts ratificants from conducting R&D and initial preparations for a nuclear weapons capacity up to the point of outright manufacture or testing; thus, as discussed in Chapter 2, there is a discernible world drift to nuclear weapons options. Unfortunately, the NPT is not structurally capable of addressing the situations of ambiguous proliferation and nuclear weapons options, both potentially dangerous trends; one of the primary problems is the Treaty's insufficient definition and conceptualization of nuclear proliferation (Chapter 1 and Chapter 2). Thus, at the 1985 Conference an effort may be initiated by certain NNWSs to formulate a new conceptualization of nuclear proliferation, one which more adequately conforms to the current realities of the spread of nuclear weapons and nuclear capabilities.

Concerning the attendance at the event, past NPT Review Conferences usually had rather dismal turnouts of signatory nations and observers; the 1985 Conference, however, should see a much fuller complement of the 124 signatories due to the increasing international significance of the matter. Furthermore, additional nations may decide, or be persuaded, to ratify the Treaty. As a result of the 1980 Conference, six countries: Bangladesh, Barbados, Egypt, Indonesia, Sri Lanka, and Turkey, ascended to the NPT. It can be expected that the NWSs, particularly the US, will urge non-parties to sign and will advocate broader international adherence and compliance to the Treaty's precepts. As a result of these actions a number of additional small countries, such as the newly independent Caribbean micro-

states, may join the ranks. However, it will be exceedingly difficult for the NPT members to convince the larger more determined NPT holdouts, such as India, South Africa, Israel, Pakistan, Brazil, and Argentina, of the expediency and advantages of ratification. One large nation which may sign in 1985 is Spain since adherence to the NPT is a necessary condition for the country's full integration into NATO.

But the more important question in 1985 may not be how many nations will join, but how many nations will withdraw throughout the course of the assuredly tulmultuous proceedings or at the close of the Conference. Up to this point, the NNWSs have relied only on the passing of unbinding resolutions, or of proposing amendments destined for defeat, as a means of protest against what they perceive as the insufficient fulfillment of provisions of the NPT, but in 1985 they may utilize a more powerful tool of persuasion, namely their right of withdrawal in case of "extraordinary events". Therefore, it may require a monumental effort on the part of the NWSs, other nuclear suppliers, and the devoted NNWSs to prevent numerous current adherents from abrogating the Treaty. As expressed by one writer, "The threat of withdrawal from the treaty must be taken seriously. The 1985 Review Conference might well be the grandstand from which a group of non-weapon countries choose to dramatize their exeunt from the treaty." (Duffy, 1982, p. 209). In this instance it is conceivable that in the late 1980s the NNWSs, led by the Third World, could organize another Conference of Non-Nuclear Weapons States, similar to that held in 1968, to further air their complaints and to consider the future of nuclear proliferation and the non-proliferation regime.

It would not at all be surprising if, at the 1985 Conference, the members will once again fail to agree on a final communique due to the anticipated sharp disagreements over postures, perceptions, and approaches. Thus, the Review Conference could conceivably conclude that the NPT is an inherently flawed and outdated convention - the death knell for the Treaty. According

to the NPT Article X, the Treaty shall come up for renewal in 1995, at which time it can be renegotiated, adhered to intact for a further length of time, or scrapped in its entirety; therefore, 1995 will prove the true indicator of the future of nuclear proliferation and of the course of international relations.

GLOSSARY OF ABBREVIATIONS

ABM	-	Anti-Ballistic Missile
ANZUS	-	Australia, New Zealand, and United States Treaty Organization
C^3I	-	Command, Control, Communications, and Intelligence
CTB	-	Comprehensive Test Ban Treaty
ENF	-	European Nuclear Force
FRG	-	Federal Republic of Germany
IAEA	-	International Atomic Energy Association
INF	-	Intermediate-range Nuclear Forces
INFCE	-	International Nuclear Fuel Cycle Evaluation
MAD	-	Mutually Assured Destruction
MAS	-	Mutually Assured Self-restraint
MLF	-	Multilateral Force
NATO	-	North Atlantic Treaty Organization
NNPA	-	US Nuclear Non-Proliferation Act
NPT	-	Treaty on the Non-Proliferation of Nuclear Weapons
NNWS	-	Non-Nuclear Weapons State
NWFZ	-	Nuclear Weapons Free Zone
NWS	-	Nuclear Weapons State
PNE	-	Peaceful Nuclear Explosion
SALT	-	Strategic Arms Limitation Talks
SCR	-	Security Council Resolution
SDI	-	Strategic Defense Initiative
SEATO	-	South East Asia Treaty Organization
START	-	Strategic Arms Reduction Talks
WEU	-	West European Union

APPENDICES

Text of the Nuclear Non-proliferation Treaty

TREATY ON THE NON-PROLIFERATION OF NUCLEAR WEAPONS

Signed at London, Moscow and Washington on 1 July 1968
Entered into force on 5 March 1970
Depositaries: UK, US and Soviet governments

The States concluding this Treaty, hereinafter referred to as the "Parties to the Treaty",

Considering the devastation that would be visited upon all mankind by a nuclear war and the consequent need to make every effort to avert the danger of such a war and to take measures to safeguard the security of peoples,

Believing that the proliferation of nuclear weapons would seriously enhance the danger of nuclear war,

In conformity with resolutions of the United Nations General Assembly calling for the conclusion of an agreement on the prevention of wider dissemination of nuclear weapons,

Undertaking to co-operate in facilitating the application of International Atomic Energy Agency safeguards on peaceful nuclear activities,

Expressing their support for research, development and other efforts to further the application, within the framework of the International Atomic Energy Agency safeguards system, of the principle of safeguarding effectively the flow of source and special fissionable materials by use of instruments and other techniques at certain strategic points,

Affirming the principle that the benefits of peaceful applications of nuclear technology, including any technological by-products which may be derived by nuclear-weapon States from the development of nuclear explosive devices, should be available for peaceful purposes to all Parties to the Treaty, whether nuclear-weapon or non-nuclear-weapon States,

Convinced that, in furtherance of this principle, all Parties to the Treaty are entitled to participate in the fullest possible exchange of scientific information for, and to contribute alone or in co-operation with other States to, the further development of the applications of atomic energy for peaceful purposes,

Declaring their intention to achieve at the earliest possible date the cessation of the nuclear arms race and to undertake effective measures in the direction of nuclear disarmament,

Urging the co-operation of all States in the attainment of this objective,

Recalling the determination expressed by the Parties to the 1963 Treaty banning nuclear weapon tests in the atmosphere, in outer space and under water in its Preamble to seek to achieve the discontinuance of all test explosions of nuclear weapons for all time and to continue negotiations to this end,

Desiring to further the easing of international tension and the strengthening of trust between States in order to facilitate the cessation of the manufacture of nuclear weapons, the liquidation of all their existing stockpiles, and the elimination from national arsenals of nuclear weapons and the means of their delivery pursuant to a Treaty on general and complete disarmament under strict and effective international control,

Recalling that, in accordance with the Charter of the United Nations, States must refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any State, or in any other manner inconsistent with the Purposes of the United Nations, and that the establishment and maintenance of international peace and security are to be promoted with the least diversion for armaments of the world's human and economic resources,

Have agreed as follows:

Article I

Each nuclear-weapon State Party to the Treaty undertakes not to transfer to any recipient whatsoever nuclear weapons or other nuclear explosive devices or control over such weapons or explosive devices directly, or indirectly; and not in any way to assist, encourage, or induce any non-nuclear-weapon State to manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices, or control over such weapons or explosive devices.

Article II

Each non-nuclear-weapon State Party to the Treaty undertakes not to receive the transfer from any transferor whatsoever of nuclear weapons or other nuclear explosive devices or of control over such weapons or explosive devices directly, or indirectly; not to manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices; and not to seek or receive any assistance in the manufacture of nuclear weapons or other nuclear explosive devices.

Article III

1. Each non-nuclear-weapon State Party to the Treaty undertakes to accept safeguards, as set forth in an agreement to be negotiated and concluded with the International Atomic Energy Agency in accordance with the Statute of the International Atomic Energy Agency and the Agency's safeguards system, for the exclusive purpose of verification of the fulfilment of its obligations assumed under this Treaty with a view to preventing diversion of nuclear energy from peaceful uses to nuclear weapons or other nuclear explosive devices. Procedures for the safeguards required by this Article shall be followed with respect to source or special fissionable material whether it is being produced, processed or used in any principal nuclear facility or is outside any such facility. The safeguards required by this Article shall be applied on all source or special fissionable material in all peaceful nuclear activities within the territory of such State, under its jurisdiction, or carried out under its control anywhere.

2. Each State Party to the Treaty undertakes not to provide: (*a*) source or special fissionable material, or (*b*) equipment or material especially designed or prepared for the processing, use or production of special fissionable material, to any non-nuclear-weapon State for peaceful purposes, unless the source or special fissionable material shall be subject to the safeguards required by this Article.

3. The safeguards required by this Article shall be implemented in a manner designed to comply with Article IV of this Treaty, and to avoid hampering the economic or technological development of the Parties or international co-operation in the field of peaceful nuclear activities, including the international exchange of nuclear material and equipment for the processing, use or production of nuclear material for peaceful purposes in accordance with the provisions of this Article and the principle of safeguarding set forth in the Preamble of the Treaty.

4. Non-nuclear-weapon States Party to the Treaty shall conclude agreements with the International Atomic Energy Agency to meet the requirements of this Article either individually or together with other States in accordance with the Statute of the International Atomic Energy Agency. Negotiation of such agreements shall commence within 180 days from the original entry into force of this Treaty. For States depositing their instruments of ratification or accession after the 180-day period, negotiation of such agreements shall commence not later than the date of such deposit. Such agreements shall enter into force not later than eighteen months after the date of initiation of negotiations.

Article IV

1. Nothing in this Treaty shall be interpreted as affecting the inalienable right of all the Parties to the Treaty to develop research, production and use of nuclear energy for peaceful purposes without discrimination and in conformity with Articles I and II of this Treaty.

2. All the Parties to the Treaty undertake to facilitate, and have the right to participate in, the fullest possible exchange of equipment, materials and scientific and technological information for the peaceful uses of nuclear energy. Parties to the Treaty in a position to do so shall also co-operate in contributing alone or together with other States or international organizations to the further development of the applications of nuclear energy for peaceful purposes, especially in the territories of non-nuclear-weapon States Party to the Treaty, with due consideration for the needs of the developing areas of the world.

Article V

Each Party to the Treaty undertakes to take appropriate measures to ensure that, in accordance with this Treaty, under appropriate international observation and through appropriate international procedures, potential benefits from any peaceful applications of nuclear explosions will be made available to non-nuclear-weapon States Party to the Treaty on a non-discriminatory basis and that the charge to such Parties for the explosive devices used will be as low as possible and exclude any charge for research and development. Non-nuclear-weapon States Party to the Treaty shall be able to obtain such benefits, pursuant to a special international agreement or agreements, through an appropriate international body with adequate representation of non-nuclear-weapon States. Negotiations on this subject shall commence as soon as possible after the Treaty enters into force. Non-nuclear-weapon States Party to the Treaty so desiring may also obtain such benefits pursuant to bilateral agreements.

Article VI

Each of the Parties to the Treaty undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control.

Article VII

Nothing in this Treaty affects the right of any group of States to conclude regional treaties in order to assure the total absence of nuclear weapons in their respective territories.

Article VIII

1. Any Party to the Treaty may propose amendments to this Treaty. The text of any proposed amendment shall be submitted to the Depositary Governments which shall circulate it to all Parties to the Treaty. Thereupon, if requested to do so by one-third or more of the Parties to the Treaty, the Depositary Governments shall convene a conference, to which they shall invite all the Parties to the Treaty, to consider such an amendment.

2. Any amendment to this Treaty must be approved by a majority of the votes of all the Parties to the Treaty, including the votes of all nuclear-weapon States Party to the Treaty and all other Parties which, on the date the amendment is circulated, are members of the Board of Governors of the International Atomic Energy Agency. The amendment shall enter into force for each Party that deposits its instrument of ratification of the

amendment upon the deposit of such instruments of ratification by a majority of all the Parties, including the instruments of ratification of all nuclear-weapon States Party to the Treaty and all other Parties which, on the date the amendment is circulated, are members of the Board of Governors of the International Atomic Energy Agency. Thereafter, it shall enter into force for any other Party upon the deposit of its instrument of ratification of the amendment.

3. Five years after the entry into force of this Treaty, a conference of Parties to the Treaty shall be held in Geneva, Switzerland, in order to review the operation of this Treaty with a view to assuring that the purposes of the Preamble and the provisions of the Treaty are being realised. At intervals of five years thereafter, a majority of the Parties to the Treaty may obtain, by submitting a proposal to this effect to the Depositary Governments, the convening of further conferences with the same objective of reviewing the operation of the Treaty.

Article IX

1. This Treaty shall be open to all States for signature. Any State which does not sign the Treaty before its entry into force in accordance with paragraph 3 of this Article may accede to it at any time.

2. This Treaty shall be subject to ratification by signatory States. Instruments of ratification and instruments of accession shall be deposited with the Governments of the United Kingdom of Great Britain and Northern Ireland, the Union of Soviet Socialist Republics and the United States of America, which are hereby designated the Depositary Governments.

3. This Treaty shall enter into force after its ratification by the States, the Governments of which are designated Depositaries of the Treaty, and forty other States signatory to this Treaty and the deposit of their instruments of ratification. For the purposes of this Treaty, a nuclear-weapon State is one which has manufactured and exploded a nuclear weapon or other nuclear explosive device prior to 1 January, 1967.

4. For States whose instruments of ratification or accession are deposited subsequent to the entry into force of this Treaty, it shall enter into force on the date of the deposit of their instruments of ratification or accession.

5. The Depositary Governments shall promptly inform all signatory and acceding States of the date of each signature, the date of deposit of each instrument of ratification or of accession, the date of the entry into force of this Treaty, and the date of receipt of any requests for convening a conference or other notices.

6. This Treaty shall be registered by the Depositary Governments pursuant to Article 102 of the Charter of the United Nations.

Article X

1. Each Party shall in exercising its national sovereignty have the right to withdraw from the Treaty if it decides that extraordinary events, related to the subject matter of this Treaty, have jeopardized the supreme interests of its country. It shall give notice of such withdrawal to all other Parties to the Treaty and to the United Nations Security Council three months in advance. Such notice shall include a statement of the extraordinary events it regards as having jeopardized its supreme interests.

2. Twenty-five years after the entry into force of the Treaty, a conference shall be convened to decide whether the Treaty shall continue in force indefinitely, or shall be extended for an additional fixed period or periods. This decision shall be taken by a majority of the Parties to the Treaty.

Article XI

This Treaty, the English, Russian, French, Spanish and Chinese texts of which are equally authentic, shall be deposited in the archives of the Depositary Governments. Duly certified copies of this Treaty shall be transmitted by the Depositary Governments to the Governments of the signatory and acceding States.

Excerpted from: Goldblat, Jozef, Agreements for Arms Control (SIPRI). London: Taylor and Francis, 1982.

Appendix 2

Survey of Third World Nuclear Energy Programs

Argentina

Argentina has the most advanced nuclear program in Latin America. It has declared its intention to become self-sufficient in all phases of nuclear energy by 1984, when it may begin exporting fuel-cycle technology. It has a pilot reprocessing facility, has sold a research reactor to Peru, and has given technical aid to Ecuador, Paraguay, Chile, and Columbia. A 344 megawatt (MWe) reactor has been operating at Atucha since 1974, a second 600 MWe reactor is under construction and is anticipated to be ready in 1983, four more nuclear reactors are scheduled to come on-line beginning in the late 1980s, and construction of a reprocessing plant has been authorized. Argentina has significant uranium reserves, which it will soon begin to tap, and is currently producing fuel elements on a pilot basis and will soon expand to a rate of 250 tons annually. It has not signed the nonproliferation treaty, nor does it accept International Atomic Energy Agency (IAEA) safeguards.

Bangladesh

Bangladesh began considering the option of nuclear power when it was still East Pakistan, and between 1963 and 1969 several feasibility studies were prepared for that country by Western European agencies. The civil war interrupted plans for an agreement with Belgium to supply a reactor. After a period of disinterest, which Bangladeshi officials attributed to the nation's impoverished condition, the Bangladesh Atomic Energy Commission approved a modest 125 MWe reactor to meet energy needs, especially for irrigation and food production. Subsequent review indicated, however, that a larger reactor would be more suitable for national needs, and Bangladesh is planning to construct a nuclear power plant at Rooppur, Pabna, east of Dacca. This plant reportedly will be a 300 MWe reactor that will be purchased from France. Saudi Arabia will pay two-thirds of the cost, and France will pay for the remainder. The Bangladeshi government has made the obtaining of nuclear power a high priority and nearly half of the country's research budget is devoted to the Atomic Energy Commission.

Brazil

Brazil, which, like Argentina, desires total nuclear independence, is in the final stages of preparing a 626 MWe Westinghouse reactor to go on-line. This plant and two other reactors under construction are located about one hundred miles south of Rio de Janeiro. In opposition to the will of the U.S. government in 1975, Brazil agreed to buy six to eight reactors, along with reprocessing and enrichment facilities, from West Germany. Now, collaborating with France, Brazil is completing a hexafluoride conversion plant and a uranium milling facility, which are scheduled to begin operation in 1983. Exchange and cooperation agreements have been signed with Chile, Bolivia, Paraguay, Venezuela, Argentina, and many other countries. Brazil has placed all of its facilities under full-scope safeguards.

Chile

Chile created a Nuclear Energy Commission in 1965. It subsequently set up two research centers, each with a small research reactor. The British one began operation in 1974, and the other one—which is a 20 MWe reactor—began operation in 1977 with Spanish assistance. Also, Chile intends to order a 600 MWe reactor, which it hopes to have in operation in 1990.

People's Republic of China

People's Republic of China has ambitious plans to solve many of its problems through nuclear power. Provided that technical and financial assistance can be obtained from international sources, China intends to

have approximately 2,000 MWe of nuclear power by 1990 and 15,000 MWe of power by the year 2000. If foreign assistance is not available, China claims the capability of developing its own commercial nuclear energy, although on a smaller scale than could be realized with help. China already has experience operating plutonium production and heavy-water research reactors and a heavy-water production plant. However, although the CANDÚ heavy-water reactors are being considered, most Chinese feasibility studies have looked at pressurized light-water reactors. Facilities already exist for uranium enrichment and conversion as well as for fuel-element fabrication and spent-fuel reprocessing. Although uranium resources are sufficient to meet near-term requirements, more will be needed to meet distant needs. China's unexplored regions offer good prospects for future discoveries. Chinese scientists have experience in radioactive waste disposal (including river-discharge methods) and are planning to develop a fast-breeder reactor eventually. China is considering a joint project with Hong Kong, which entails building two 900 MWe reactors in Guangdong Province, and several more reactors are being planned.

Cuba

Cuba plans to have nearly 900 MWe of nuclear power, generated by two Russian reactors, within five years. These highly ambitious plans, which project that reactors generating more than 1,700 MWe will be on-line by the end of this decade, are being carried out with substantial assistance from the Soviet Union, reportedly under the supervision of the Cuban Academy of Sciences. The first two plants will be located in Huragua, and the second two will be near Holguin.

Egypt

Egypt's plan for a nuclear program, begun in 1963, was put aside because of political and economic turmoil and international disagreements. Recently, however, Egypt has undertaken an ambitious program, ordering two 900 MWe reactors from France and signing an agreement with the United States for the purchase of two 1,000 MWe reactors and sufficient uranium for their operation. Arrangements are also being completed to purchase two British and two West German reactors. The intention is to have eight nuclear plants supplying 40 percent of the country's electricity needs by the year 2000. Egypt has uranium deposits, and it is anticipated that mining, which is expected to begin soon, will eventually produce 100 tons a year from sources located in the eastern desert.

India

India had Canadian cooperation in constructing its first research reactor, a 40 MWe heavy-water type, which began operation in 1956 and its first power reactors at Rajasthan. India has always followed an aggressive plan in becoming self-sufficient in designing, constructing, and operating nuclear power reactors. Its strategy has been built on the basis that the nation's uranium reserves are limited and its thorium resources are plentiful. India intends to follow its natural-uranium reactors with fast breeder reactors and, eventually, a self-sustaining thorium U-233 cycle. It is hoping to have 20,000 of MWe power installed by the year 2000. The first nuclear power station in India, located at Tarapur near Bombay, is a boiling light-water reactor supplied by the United States. It went into service in 1969. While initially supplied by the United States, enriched-uranium fuel elements for Tarapur are now fabricated at a nuclear fuel complex in Hyderbad from U.S.-supplied enriched-uranium feed.

Indonesia

Indonesia intends to have a 600 MWe reactor in operation by 1987 and plans to construct a nuclear research station in Serpong, southwest of Jakarta. Among its other research facilities, the station will have a heavy-water reactor. Indonesia already has a small heavy-water reactor in Bandung; this reactor produces radioactive isotopes for industrial, agricultural, and medical purposes. Uranium deposits have been discovered in Borneo and exploration for more deposits is continuing in Sumatra.

Iran

Before the 1979 revolution, Iran had an extremely ambitious nuclear program. Its aim was to produce half of the national electrical needs by having reactors generating 23,000 MWe on-line by 1992. This decision was made in 1970 by the late Shah of Iran, who wanted to hasten modernization and conserve oil and gas reserves for general use and for foreign exchange. After the Iranian revolution, all construction was halted on the first two reactors in the program, twin 1,200 MWe pressurized-water reactors located at Bushehr, although one unit was near completion and the other was half-finished. Some have suggested that war and insurgency could spur the Iranian leaders to complete the nuclear facilities in order to safeguard electrical supplies, but this course of action seems unlikely to most observers.

Iraq

Iraq has had an Atomic Energy Commission since 1956. During the 1960s, it received a small (2 kW thermal) research reactor from the Soviet Union. In 1975, Iraq bought a 40 MWt (expandable to 70 MWt) reactor from France and some research facilities from France and Italy as part of oil-for-technology exchanges. The reactor, which would have been ready for commissioning by late 1981, was destroyed on June 7, 1981, when the Israelis bombed the Iraqi nuclear facility outside of Baghdad, because they claimed the reactor would have been used to manufacture a nuclear explosive device. After the attack, the French agreed, in principle, to rebuild the reactor, redesigning it to use a much lower grade of uranium. Saudi Arabia has offered to pay for the plant. France also signed a letter (not a contract) agreeing to build a 900 MWe reactor for the Iraqis, although completion of this reactor is not expected before the next century. Iraq has received 12 kilograms of highly enriched uranium fuel from France and 100 tons of natural uranium from both Portugal and Niger.

In 1979, Brazil agreed, in principle, to train Iraqi scientists, and provide technical advice and more enriched uranium.

Republic of Korea

The Republic of Korea, or South Korea, with its very limited indigenous energy resources, relies heavily on imported oil. The nation views dependence on a single form of imported energy as undesirable, primarily because import interruptions could have a disastrous effect on the economy or threaten the national security. Therefore, Korea has assigned top priority to diversifying to nuclear power. It has one 587 MWe unit in operation, and it hopes to have more than 48,000 MWe (60 percent of its generating capacity) on-line by the year 2000. Although the Korean nuclear program has drawn heavily on U.S. expertise and technology, reportedly because of the Koreans' concern about U.S. nonproliferation requirements, in November 1980, Korea contracted with France to buy two reactors, which will also provide some enrichment services. A contract with France for a reprocessing plant was canceled after the United States and other nations complained, but, ultimately, Korea hopes to control its own nuclear fuel cycle. The country has procured about 14,000 tons of U_3O_8 and has a joint exploration program underway with Gabon and Paraguay.

Libya

Libya has also given high priority to nuclear energy in its 1981-1985 development plan. Colonel Muammar Qaddafi, stressing the importance of nuclear technology, recently formed a Ministry for Atomic Energy, which now has executive powers over the Libyan Atomic Energy Commission, established in 1973. Libya has already purchased a small research reactor and ordered a twin reactor (2 × 440 MWe) plant from the Soviet Union. The plant will be located on the Gulf of Sidra and will also provide power to a desalination plant. In 1981, the Soviet Union offered Libya another twin 440 MWe unit, but it is as yet unclear whether Libya will accept it. There have been reports that Libya has nuclear technology agreements with Pakistan and Argentina and has bought natural uranium from Niger.

Mexico

Mexico is constructing two 650 MWe U.S.-supplied boiling-water reactors at Laguna Verde and is considering a massive expansion in its nuclear program. The Federal Electricity Commission has recommended constructing twenty reactors over the next two decades, and a plan to build a uranium-enrichment plant is under consideration. Mexico is trying to decide how much independence it wants to have in its nuclear activities in general. The Mexican plan for rapid expansion has attracted considerable foreign interest, and the United States, Canada, Sweden, France, and West Germany have all increased their technical contacts with Mexico. However, because of economic problems induced by the slack in the oil market, those Mexicans who wish to delay expanding the nuclear program are gaining influence.

Pakistan

An acute shortage of energy sources, added to the inherent attractions of nuclear power, have led Pakistan to develop atomic plants. The nation's first nuclear reactor, a 125 MWe CANDU ordered from Canada in 1965, began operating commercially at Kanupp, near Karachi, in 1972. Because Pakistan refused to abide by the full-scope safeguards imposed by Canada in 1974 and 1976, an embargo was placed on supplies of nuclear fuel and replacement parts, thus limiting the reactor's operation. Currently, the reactor is operating on domestically fabricated fuel and the remaining Canadian stocks. Pakistan eventually plans to complete the construction of a 600 MWe light-water reactor that was begun at Chashma (250 miles from Karachi) in 1974 but was quickly suspended because of lack of capital. Pakistan is also building an unsafeguarded uranium-enrichment facility, using equipment secretly purchased from West Germany, Britain, Holland, France, and other countries. Pakistan contracted for a chemical reprocessing facility from France in 1974. Progress on the facility was frustrated

because of French withdrawal in 1979. The country has some indigenous uranium, and a nuclear-fuel-manufacturing plant has been established at Chashma.

The Philippines

The nuclear program in the Philippines has been plagued by corruption and environmental challenges. The Filipino government ordered a Westinghouse 620 MWe reactor in 1976, but, after the U.S. nuclear accident at Three Mile Island, it suspended construction in June 1979. In September 1980, after a commission conducted safety hearings on the plant, the suspension was lifted and construction resumed. The government is anxious to complete the project in order to avoid a critical power shortage in the Luzon area as oil-fired thermal plants are phased out. The nuclear plant, located on Bataan, together with a twin yet to be constructed, will provide about one-third of the total installed electrical capacity.

Republic of China

Republic of China (Taiwan) has turned to nuclear power because of its rapidly rising economic and energy growth, as well as the prices of imported oil. The first phase of Taiwan's extraordinarily ambitious nuclear program involves the construction of three twin stations (six reactors), half of which are already on-line, to supply substantial proportions of the country's electricity. Officials expect that, by 1985, nearly 40 percent of Taiwan's projected electrical generating capacity will be nuclear powered.

Turkey

Turkey has had a long-standing interest in nuclear power, but economic and political problems have interfered with the country's developing a nuclear program. A plan for a 600 MWe reactor in Akkuyu, near Antalaya, has been facing uncertainty and setbacks. It was designated to be constructed by the Swedish company Aktiebolaget Asea-Atom; however, this decision may be changed. Turkey has modest uranium but large thorium deposits.

Venezuela

Venezuela had an aggressive nuclear program when it was under a dictatorship in the 1950s, but it is currently assuming a wait-and-see stance. At present, the country only has a small research reactor, but it may have a reactor on-line in the mid-1990s. CONADIN, Venezuela's nuclear energy planning agency, has commissioned feasibility studies and requested proposals for a reactor-siting survey. A recent study for the Venezuelan state oil company suggests that a natural-uranium, gas-cooled reactor could provide process steam to extract oil from the bituminous tar sands of the Orinoco Basin. Venezuela is also exploring for uranium reserves in its territory.

Yugoslavia

From the beginning of its nuclear program, Yugoslavia has been intent on developing its own industrial capabilities and controlling as much of the nuclear construction and fuel cycle as possible. It has succeeded to the extent that it is now capable of supplying 50 percent of the equipment of a nuclear power station. A uranium mine in the Republic of Slovenia began operation in 1980 and should provide all fuel needs for the first several reactors. In 1974, at Krsko, construction began on a Westinghouse turn-key reactor, which went critical in September 1981. This first plant of Western origin to begin operating in a Communist country would have been completed earlier if not for the delays in granting export licenses, which occurred during the Carter administration, and the environmental concerns of the contiguous province of Croatia, which has its own nuclear power ambitions. Five plants will be in operation by the year 2000, and plans for the development of twelve more by that time have also been reported. Ultimately, Yugoslavia plans to export electricity to other Soviet-bloc nations.

Excerpted from: Katz, James, and Marwah, Onkar(eds: Nuclear Power in Developing Countries. Lexington, Mass.: D.C. Heath and Co., 1982.

Appendix 3

World Nuclear Power Reactors (as of 31 December, 1982)

COUNTRY	Operating Reactors		Reactors Under Construction	
	Number of units	Total MW(e)	Number of Units	Total MW(e)
Argentina	1	345	1	600
Belgium	4	1 676	4	3 811
Brazil	-	-	3	3 116
Bulgaria	2	816	2	828
Canada	10	5 245	14	9 751
Cuba	-	-	1	408
Czechoslovakia	2	491	3	142
Egypt	-	-	8	6 000
Finland	2	1 080	2	1 080
France	16	8 163	21	20 290
German DR	4	1 287	5	2 040
FR Germany	15	8 782	10	10 638
Hungary	-	-	2	816
India	3	602	5	1 087
Israel	-	-	1	600
Italy	4	1 382	3	1 996
Japan	21	13 249	11	9 408
Korea, Republic of	1	564	6	5 137
Mexico	-	-	2	308
Netherlands	2	499	-	-

Appendix 3 (cont.)

World Nuclear Power Reactors(as of 31 December, 1982)

COUNTRY	Operating Reactors		Reactors under Construction	
	Number of Units	Total MW(e)	Number of Units	Total MW(e)
Pakistan	1	125	-	-
Philippines	-	-	1	621
Poland	-	-	2	816
Romania	-	-	1	440
South Africa	-	-	2	1 834
Spain	3	1 073	7	6 302
Sweden	6	3 700	6	5 682
Switzerland	4	1 926	1	942
Taiwan	2	1 208	2	1 902
Thailand	-	-	1	600
Turkey	-	—	1	620
UK	32	6 890	6	3 714
USA	69	50 644	88	96 408
USSR	30	10 610	18	18 200
Yugoslavia	-	-	1	632
Total	234	120 363	241	215 778

1. Reactors in the power ascension phase are included in operating plants.
2. Construction in Austria and Iran has been interrupted, so the plants are not included.
3. Some reactors are still under negotiation; Egypt (4 reactors), Israel (1 reactor) and Turkey (1 reactor).

Source:

1. Based on Power Reactors in Member States, IAEA, Vienna, 1979; Cited in "World Armaments and Disarmament", SIPRI Yearbook 1980, Taylor and Francis Ltd, London, 1980, p.329
2. PAJAK, Roger F, "Nuclear Status and Policies of the Middle East Countries", International Affairs, Vol 59, No 4, Autumn 1983
3. NEWSWEEK, December 5, 1983

Excerpted from: Magdy, Amer M., Israel's Nuclear Posture. Research Paper, Institute of Social Studies, The Hague, 1984.

Appendix 4

Comprehensive Listing of NPT Signatories

Situation on 31 December 1983 with respect to the conclusion of safeguards agreements between the Agency and non-nuclear-weapon States in connection with NPT

Non-nuclear-weapon States which have signed, ratified, acceded to or succeeded to NPT[a] (1)	Date of ratification, accession or succession[a] (2)	Safeguards agreement with the Agency (3)		INFCIRC (4)
Afghanistan	4 February 1970	In force:	20 February 1978	257
Antigua and Barbuda	1 November 1981			
Australia	23 January 1973	In force:	10 July 1974	217
Austria	27 June 1969	In force:	23 July 1972	156
Bahamas	10 July 1973			
Bangladesh	27 September 1979	In force:	11 June 1982	301
Barbados	21 February 1980			
Belgium	2 May 1975	In force:	21 February 1977	193
Benin	31 October 1972			
Bolivia[b]	26 May 1970	Signed:	23 August 1974	
Botswana	28 April 1969			
Bulgaria	5 September 1969	In force:	29 February 1972	178
Burundi	19 March 1971			
Canada	8 January 1969	In force:	21 February 1972	164
Cape Verde	24 October 1979			
Central African Republic	25 October 1970			
Chad	10 March 1971			
Colombia[c]				
Congo	23 October 1978			
Costa Rica[b]	3 March 1970	In force:	22 November 1979	270
Cyprus	10 February 1970	In force:	26 January 1973	189
Czechoslovakia	22 July 1969	In force:	3 March 1972	173
Democratic Kampuchea	2 June 1972			
Democratic Yemen	1 June 1979			
Denmark[c]	3 January 1969	In force:	21 February 1977	193
Dominican Republic[b]	24 July 1971	In force:	11 October 1973	201
Ecuador[b]	7 March 1969	In force:	10 March 1975	231
Egypt	26 February 1981	In force:	30 June 1982	302
El Salvador[b]	11 July 1972	In force:	22 April 1975	232
Ethiopia	5 February 1970	In force:	2 December 1977	261
Fiji	14 July 1972	In force:	22 March 1973	192
Finland	5 February 1969	In force:	9 February 1972	155
Gabon	19 February 1974	Signed:	3 December 1979	
Gambia	12 May 1975	In force:	8 August 1978	277
German Democratic Republic	31 October 1969	In force:	7 March 1972	181
Germany, Federal Republic of	2 May 1975	In force:	21 February 1977	193
Ghana	5 May 1970	In force:	17 February 1975	226
Greece[f]	11 March 1970	Accession:	17 December 1981	193
Grenada	19 August 1974			
Guatemala[b]	22 September 1970	In force:	1 February 1982	298
Guinea-Bissau	20 August 1976			
Haiti[b]	2 June 1970	Signed:	6 January 1975	
Holy See	25 February 1971	In force:	1 August 1972	167
Honduras[b]	16 May 1973	In force:	18 April 1975	235
Hungary	27 May 1969	In force:	30 March 1972	174
Iceland	18 July 1969	In force:	16 October 1974	215
Indonesia	12 July 1979	In force:	14 July 1980	283
Iran, Islamic Republic of	2 February 1970	In force:	15 May 1974	214
Iraq	29 October 1969	In force:	29 February 1972	172
Ireland	1 July 1968	In force:	21 February 1977	193
Italy	2 May 1975	In force:	21 February 1977	193
Ivory Coast	6 March 1973	In force:	8 September 1983	309
Jamaica[b]	5 March 1970	In force:	6 November 1978	265
Japan	8 June 1976	In force:	2 December 1977	255

(1)	(2)	(3)	(4)
Jordan	11 February 1970	In force: 21 February 1978	258
Kenya	11 June 1970		
Korea, Republic of	23 April 1975	In force: 14 November 1975	236
Kuwait[a]			
Lao People's Democratic Republic	20 February 1970		
Lebanon	15 July 1970	In force: 5 March 1973	191
Lesotho	20 May 1970	In force: 12 June 1973	199
Liberia	5 March 1970		
Libyan Arab Jamahiriya	26 May 1975	In force: 8 July 1980	282
Liechtenstein	20 April 1978	In force: 4 October 1979	275
Luxembourg	2 May 1975	In force: 21 February 1977	193
Madagascar	8 October 1970	In force: 14 June 1973	200
Malaysia	5 March 1970	In force: 29 February 1972	182
Maldives	7 April 1970	In force: 2 October 1977	253
Mali	10 February 1970		
Malta	6 February 1970		
Mauritius	25 April 1969	In force: 31 January 1973	190
Mexico[b]	21 January 1969	In force: 14 September 1973	197
Mongolia	14 May 1969	In force: 5 September 1972	188
Morocco	27 November 1970	In force: 18 February 1975	228
Nauru[a]	7 June 1982		
Nepal	5 January 1970	In force: 22 June 1972	186
Netherlands[d]	2 May 1975	In force: 21 February 1977	193
New Zealand	10 September 1969	In force: 29 February 1972	185
Nicaragua[b]	6 March 1973	In force: 29 December 1976	246
Nigeria	27 September 1968		
Norway	5 February 1969	In force: 1 March 1972	177
Panama	13 January 1977		
Papua New Guinea	25 Jan 1982	In force: 13 October 1983	312
Paraguay[b]	4 February 1970	In force: 20 March 1979	279
Peru[b]	3 March 1970	In force: 1 August 1979	273
Philippines	5 October 1972	In force: 16 October 1974	216
Poland	12 June 1969	In force: 11 October 1972	179
Portugal	15 December 1977	In force: 14 June 1979	272
Romania	4 February 1970	In force: 27 October 1972	180
Rwanda	20 May 1975		
St.Lucia	28 December 1979		
Samoa	17 March 1975	In force: 22 January 1979	268
San Marino	10 August 1970	Approved by the Board, Feb.1977	
Senegal	17 December 1970	In force: 14 January 1980	276
Sierra Leone	26 February 1975	Signed: 10 November 1977	
Singapore	10 March 1976	In force: 18 October 1977	259
Solomon Islands	17 June 1981		
Somalia	5 March 1970		
Sri Lanka	5 March 1979	Signed: 5 July 1980	
Sudan	31 October 1973	In force: 7 January 1977	245
Suriname[b]	30 June 1976	In force: 2 February 1979	269
Swaziland	11 December 1969	In force: 28 July 1975	227
Sweden	9 January 1970	In force: 14 April 1975	234
Switzerland	9 March 1977	In force: 6 September 1978	264
Syrian Arab Republic	24 September 1969		
Thailand	7 December 1972	In force: 16 May 1974	241
Togo	26 February 1970		
Tonga	7 July 1971	Approved by the Board, Feb.1975	
Trinidad and Tobago[a]			

(1)	(2)	(3)	(4)
Tunisia	26 February 1970		
Turkey	17 April 1980	In force: 1 September 1981	295
Tuvalu	19 January 1979		
Uganda	20 October 1982		
United Republic of Cameroon	8 January 1969		
Upper Volta	3 March 1970		
Uruguay[b/]	31 August 1970	In force: 17 September 1976	157
Venezuela[b/]	26 September 1975	In force: 11 March 1982	300
Viet Nam	14 June 1982		
Yemen Arab Republic[e/]			
Yugoslavia	3 March 1970	In force: 28 December 1973	204
Zaire	4 August 1970	In force: 9 November 1972	183

a/ The information reproduced in columns (1) and (2) was provided to the Agency by depositary Governments of NPT, and an entry in column (1) does not imply the expression of any opinion on the part of the Secretariat concerning the legal status of any country or territory or of its authorities, or concerning the delimitation of its frontiers. The Table does not contain information relating to the participation of Taiwan, China in NPT.

b/ The relevant safeguards agreement refers to both NPT and the Tlatelolco Treaty.

c/ The NPT safeguards agreement with Denmark (INFCIRC/176), in force since 1 March 1972, has been replaced by the agreement of 5 April 1973 between the non-nuclear-weapon States of EURATOM, EURATOM and the Agency (INFCIRC/193) but still applies to the Faroe Islands.

d/ An agreement had also been concluded in respect of the Netherlands Antilles (INFCIRC/229). This agreement entered into force on 5 June 1975.

e/ The following States had signed NPT but not yet ratified it: Colombia, on 1 July 1968; Kuwait, on 15 August 1968; Trinidad and Tobago, on 22 August 1968; and the Yemen Arab Republic, on 23 September 1968.

f/ The application of Agency safeguards in Greece under the agreement INFCIRC/166, provisionally in force since 1 March 1972, was suspended on 17 December 1981, at which date Greece acceded to the agreement of 5 April 1973 (INFCIRC/193) between the non-nuclear-weapon States of EURATOM, EURATOM and the Agency.

g/ The agreement with Nauru entered into force on 13 April 1984.

Excerpted from: IAEA, The Annual Report for 1983. Vienna, 27 August, 19

Appendix 5

1974 CIA Report on the Prospects for the further Proliferation of Nuclear Weapons

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON D.C. 20343
OCT. 2 1974

Chairman Ray
Commissioner Kriegsman
Commissioner Anders
Thru: General Manager

PROSPECTS FOR FURTHER PROLIFERATION OF NUCLEAR WEAPONS

Enclosed for your information are the main conclusions reached in the final version of the Special National Intelligence Estimate (SNIE). The full text of the SNIE, carrying higher classifications and controls, is available in ISA.

Sd -
James G. Poor, Director
Division of International
Security Affairs

National Security Information

*Obtained under the Freedom of Information Act of the U.S.A.

(1) In the 1980s, the production of nuclear weapons will be within the technological and economic capabilities of many countries. The once formidable barriers to development of nuclear weapons by nations of middling size and resources have steadily diminished over time. They will continue to shrink in the years ahead as plutonium, enriched uranium, and technology become more widely spread. Some countries will consider nuclear weapons largely in terms of military utility. The principal determinant of the extent of nuclear weapons proliferation in coming years will, however, be political considerations including the policies of the superpowers with regard to proliferation, the policies of suppliers of nuclear materials and technology, and regional ambitions and tensions.

(2) *(Para blanked out here)*

(3) We believe that Israel already has produced nuclear weapons. Our judgement is based on Israeli acquisition of large quantities of uranium, partly by clandestine means; the ambiguous nature of Israeli efforts in the field of uranium enrichment, and Israel's large investment in a missile system designed to accommodate nuclear warheads. We do not expect the Israelis to provide confirmation of widespread suspicions of their capability, either by nuclear testing or by threats of use, short of a grave threat to the nation's existence. Future emphasis is likely to be on improving weapon designs, manufacturing missiles more capable in terms of distance and accuracy than the existing 200-mile Jericho, and acquiring or perfecting weapons for aircraft delivery.

(4) Several other countries—including West Germany, Sweden, Canada and Italy—could have fabricated nuclear devices more easily, from technological and financial point of view, than India and Israel. They have refrained and they are unlikely to be much influenced by weapons acquisition in countries like India. The inhibitions facing each of them are strong. In all, popular opinion is strongly opposed to the acquisition of nuclear weapons, both on emotional grounds and because such weapons could entail substantial risks—of provoking attack, of offending vital allies and of destroying existing mutual security arrangements. It would require very

fundamental changes, such as the breakup of major defence alliances accompanied by a substantial increase in strife and tension throughout the world, to induce countries like West Germany, Sweden, Canada and Italy to exercise their near term capability.

(5) The Director of Central Intelligence, the Deputy Director of General Intelligence representing the Central Intelligence Agency, the Director of Intelligence and Research representing the Department of State, the Director Defence Intelligence Agency, and the Assistant Chief of Staff for Intelligence, Department of the Army believe that Japan's situation is very similar to that of the other advanced Western nations just mentioned. They believe Japan would not embark on a program of nuclear weapons development in the absence of a major adverse shift in great power relationships which presented Japan with a clearcut threat to its security. The Assistant Chief of Staff, Intelligence Department of the Air Force and the Director of Naval Intelligence, Department of the Navy, however see a strong change that Japan's leaders will conclude that they must have nuclear weapons if they are to achieve their national objectives in the developing Asian power balance. Such a decision could come in the early 1980s. It would likely be made even sooner if there is any further proliferation of nuclear weapons, or global permissiveness regarding such activity. These developments would hasten erosion of traditional Japanese opposition to a nuclear weapons course and permit Tokyo to cross that threshold earlier in the interests of national security. Any concurrent deterioration of Japanese relations with the Communist powers or a further decline in the credibility of US defence guarantees would, in their view, further accelerate the pace of nuclear weapons development by Japan.

(6) Less sweeping changes could induce one or another of the less advanced nations to mount the sort of nuclear effort India and Israel have made. Some States, such as the Republic of China, Argentina and South Africa, will be much influenced in their decisions not only by the general course of proliferation but by such factors as growing feelings of isolation and helplessness, perceptions of major military threat and desires for regional prestige. In each of these cases, any weapons capability would probably be small and delivery probably would depend on aircraft, though there is some possibility that one or another might be able to purchase a nuclear-capable missile system from a foreign supplier.

(7) Taipei conducts its small nuclear program with a weapon option clearly in mind, and it will be in a position to fabricate a nuclear device after five years or so. Taipei's role in the world is changing radically, and concern over the possibility of complete isolation is mounting. Its decisions will be much influenced by US policies in two key areas—support for the Island's security and attitudes about the possibility of a nuclear armed Taiwan. Taipei's present course probably is leading it toward development of nuclear weapons.

(8) Argentina's small nuclear program is being pursued vigorously with an eye toward independence of foreign suppliers. It probably will provide the basis for a nuclear weapons capability in the early 1980s. Argentina has no apparent military need for nuclear weapons, but there is strong desire for them in some quarters as a way to augment Argentina's power vis-a-vis Brazil. Over time, in the absence of strong international pressures that stop nuclear weapons acquisition elsewhere, there is an even chance that Argentina will choose to join the nuclear club in a small way.

(9) *(Para blanked out here)*

South Africa probably would go forward with a nuclear weapons program if it saw a serious threat from African neighbours beginning to emerge. So serious a threat is highly unlikely in the 1970s.

(10) Other candidates—Spain, Iran, Egypt, Pakistan, Brazil and South Korea—would need at least a decade to carry out a nuclear weapons development program. One or another might detonate a demonstrative device earlier—perhaps considerably earlier by using purchased materials or by obtaining extensive foreign assistance. Each of these countries is subject to a different set of motivations and pressures. Some have enemies already making efforts in the nuclear weapons field; all will be concerned with such efforts on the part of neighbours or potential antagonists. Some will be interested in

nuclear weapons for their presumed prestige. Unless countries opposed to proliferation—particularly the US and the USSR—find ways to stop the spread of nuclear weapons program before these candidate countries are in a position to go forward, at least some of them will be motivated to join the nuclear race. The strongest impulses will probably be felt by Pakistan and Iran; Egypt and Brazil now appear to fall into a second category of likelihood.

(11) France, India and Israel, while unlikely to foster proliferation as a matter of national policy, probably will prove susceptible to the lure of the economic and political advantages to be gained from exporting materials, technology and equipment relevent to nuclear weapons programs. And most potential proliferators are on good terms with one or all of them.

(12) It is theoretically possible for a country capable of developing a nuclear weapon to do so covertly, up to the test of a first device. *And a test is not absolutely necessary.* In practice, indications of such a program are virtually certain to reach the outside world. But most countries will seek to maintain the tightest possible security with regard to any military nuclear activities, and information is likely to be intermittent and inconclusive. Indigenous ballistic missile delivery systems, on the other hand, could be readily identifiable early in the development cycle, and missile systems obtained abroad would not remain undetected for any significant period.

(13) Governments backward in the nuclear field and anxious to acquire token capability quickly are more likely to try to steal weapons and fissionable materials, despite the fact that the latter are less well detected. A country capable of developing and producing its own nuclear device is highly unlikely to try to steal weapons, but one might seek fissionable materials by theft or diversion. Competently done, diversion might go undetected.

(14) Terrorists might attempt theft of either weapons or fissionable materials. They could see the latter as useful for terror or blackmail purposes even if they had no intention of going on to fabricate weapons.

Excerpted from: Palit, Maj. Gen. D.K. and Nambodiri, P.K.S. Pakistan's Islamic Bomb. New Delhi: Vikas Publishing House, 1979.

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