
Chapter I

Introduction

Introduction

Since the first detonation of a nuclear explosive, the world has lived with the spectre of nuclear proliferation. Thirty-two years later, six nations have demonstrated their possession of nuclear explosives and perhaps two dozen more have the economic and technical prerequisites to soon follow suit if they so choose. In the decade following 1964, an intangible barrier held the number of nuclear weapons states constant and separated the nuclear-armed great powers (symbolized by the five permanent seats of the United Nations Security Council) from the rest of the international community. In 1974, India breached this barrier by detonating its own nuclear device.

Several recent international trends have aroused concern that other nations may adopt India's example. The growing demand for nuclear energy, partly as a result of the 1973-1974 quadrupling of world oil prices, has resulted in the dissemination of nuclear facilities and technology whose complex and ominous relationship with nuclear weapons has become increasingly clear. The general spread of scientific and technical knowledge has also increased the availability of information on nuclear-weapons design and fabrication. At the same time, the international political influence of the great powers has declined as part of the erosion of the post-war alliance system, the emergence of new, ambitious regional powers, and the widening split between industrialized and non-industrialized countries. Finally, the appearance of increasingly violent and sophisticated terrorist groups has added another element of fear and uncertainty to the nuclear proliferation issue.

This combination of phenomena has spawned a widespread feeling that time is running out; that unless decisive action is taken in certain critical areas very soon, an inevitable chain of events will lead to a gathering proliferation momentum. This concern is reflected in the decision of the new Administration to make proliferation control a very high-priority objective. Similarly, Congress already has under active consideration a number of bills designed to address one or another aspect of the problem.

At the root of the concern over proliferation is the fear that the spread of nuclear weaponry poses a grave and mounting threat to global stability. This threat could materialize in at least four ways. First is the obvious danger that nuclear weapons might actually be used. As is frequently pointed out, the statistical probability of use increases with the spread of weapons, other things being equal. Second, newly established nuclear powers could enter a nuclear arms race which might be politically destabilizing and, in itself, increase the

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likelihood of an outbreak of war. Third, the expanding quantity and distribution of weapons will increase the opportunities for theft, illicit sale, and sabotage. Finally, proliferation could undermine the present structure of the international political system as the acquisition of weapons alters the distribution of power.

Nuclear weapons proliferation may thus heavily impact U.S. foreign policy, whose overriding objective in recent years has been the maintenance of global political stability. This goal has been viewed as the basic precondition for the pursuit of other U.S. interests. Efforts to control proliferation may conflict with normal U.S. foreign relationships; they may raise specific and contentious issues with other nuclear supplier states, most of which are U.S. allies, and with user states, mostly in the Third World. Ironically, the one major set of relationships which is largely unaffected by proliferation is that between the United States and its Communist adversaries.

Past Approaches to Proliferation Control

Although concern over nuclear proliferation has reached new heights, recognition of the need to control it is not new. U.S. foreign policy has exhibited three relatively distinct phases in its posture toward nuclear weapons control.

The first U.S. response to nuclear weapons was essentially to try to close the lid to Pandora's box. This so-called "secrecy-denial" stage was typified by a bill introduced in September 1945 by Senator Brien McMahon. It sought "to conserve and restrict the use of atomic energy for national defense, to prohibit its private exploitation and to preserve the secret and confidential character of information concerning the use and application of atomic energy."

It quickly became apparent that such a total monopoly on nuclear technology for the indefinite future was not feasible. Instead of the McMahon bill, Congress passed the somewhat more flexible Atomic Energy Act of 1946. This Act declared that until "effective and enforceable international safeguards against the use of atomic energy for destructive purposes have been established, there shall be no exchange with other nations with respect to the use of atomic energy for industrial purposes." The Act imposed heavy penalties for disclosure of military or industrial nuclear information, thus cutting off cooperation with Great Britain and Canada despite their assistance in the wartime development.

International control was also proposed by the United States in June 1946, in what came to be known as the "Baruch Plan." The main points called for were:

- The creation of an International Atomic Development Authority which would be entrusted with all phases of the development and use of atomic energy.
- Cessation of the manufacture of atomic weapons and disposal of existing bombs. These steps would be taken upon the establishment of an adequate system for the control of atomic energy, the renunciation of the bomb as a weapon, and the formulation of a procedure for handling violations of the rules of the control.

The U.S.S.R. countered the Baruch Plan with a ban-the-bomb approach. The Soviet draft convention as introduced by Gromyko contained provisions for the prohibition of the production, storage, and use of atomic weapons and for the destruction of all such weapons within 6 months after the entry into force of the convention. Although discussions concerning the Baruch proposals continued for several years, irreconcilable differences between the United States and the U.S.S.R. made agreement impossible.

By the end of 1953 it was clear that the secrecy-denial policy had failed in both denial and control. Great Britain had exploded its first atom bomb and both the United States and U.S.S.R. had tested hydrogen bombs.

When its initial nuclear policy proved inadequate, the United States shifted its emphasis from denial to active promotion of peaceful uses of atomic energy. The new policy was initiated on December 8, 1953, by President Eisenhower in a speech before the United Nations General Assembly. That speech, whose theme stressed exploiting the good rather than the evil inherent in the atom, became known as the "Atoms for Peace" proposal. The "Atoms for Peace" program required safeguards to ensure that nuclear materials, equipment, and assistance would not be diverted from peaceful to military purposes. The International Atomic Energy Agency (IAEA), which came into force in July 1957, was assigned the responsibility for administering safeguards. The intent was to channel the apparently inevitable spread of nuclear technology into controlled nonmilitary uses.

An unintended consequence of the "Atoms for Peace" program was a blurring of the line between the peaceful and military exploitation of atomic energy. Nuclear technology and materials which are intended for peaceful purposes can be utilized, to varying degrees, in making the nuclear weapons. Accumulated technology and experience from the acquisition of nuclear power reactors has significantly lowered the technical barriers to proliferation of nuclear weapons. With time, it became apparent that a major international effort to prevent proliferation was essential. The Non-Proliferation Treaty (NPT) was put into effect in 1970 as a response to that critical requirement, and represents the third stage of U.S. policy toward proliferation.

Despite its successes to date, the NPT is not by itself a complete solution for effective control of proliferation. Among the approximately 50 nations that have not yet ratified the NPT are a number of those considered to be the most likely candidates for proliferation (the so-called "Nth countries"). International speculation already attributes a clandestine nuclear weapons capability to Israel and possibly South Africa. There is, moreover, considerable concern that some countries may ratify the NPT as a way of acquiring nuclear technology and facilities. Having obtained the prerequisites for producing weapons, they may then abrogate the treaty when it suits their purposes. As a consequence, there is a

renewed sense of urgency on behalf of efforts to gain a more adequate understanding of this complex phenomenon. The result may be a new set of policy initiatives so distinct from those of the past as to constitute a fourth phase of proliferation control.

Key Factors for New Policy Initiatives

As yet, political leaders and analysts of proliferation have reached no real consensus as to the content of the next stage of policy. Three major factors or issues appear to be at the crux of the debate.

The first issue concerns the likelihood and rate of proliferation. This in turn rests on judgments concerning:

- (1) the strength of incentives and opportunities for potential Nth countries to “go nuclear” compared to the strength of disincentives and barriers;
- (2) the relative likelihood of alternative routes to proliferation (diversion of nuclear material from commercial power systems, construction of indigenous facilities to produce weapons material, and direct purchase or theft); and
- (3) the capability and will of non-state adversaries to procure and use nuclear weapons.

The second issue concerns the nature and seriousness of the consequences of proliferation. Despite widespread concern over nuclear proliferation, some still contend that it will have a comparatively benign impact on international politics by, in effect, foreclosing resort to military force in conflict situations. Alternatively, it can be argued that proliferation will proceed at a slow to moderate rate and may jeopardize regional, but not global, stability. Even the majority who view the possibility of a proliferated world with foreboding may disagree on the precise dimensions of the threat.

The third issue relates to differing assessments of the political and economic costs and benefits of particular policy options. The matter is made more complex by the fact that some proposed policies involve fundamental transformation of domestic political, economic, and social systems, plus equally drastic international innovations, including the endowment of global institutions with significant governmental authority. Judgments concerning the desirability of any of these options will hinge not only on their specific merits but also on other factors, such as the need for nuclear energy, the ethics and advisability of intervening in the domestic affairs of other nations, and widely varying assessments of the extent of U.S. influence, real and potential.

Definition of Proliferation

No real consensus exists even on the interpretation of the word “proliferation.” The phrase is a deceptively simple one. By implication the Non-Proliferation Treaty (NPT) defines proliferation as the manufacture or acquisition of

nuclear weapons or other nuclear explosive devices by countries which do not now possess them. Conventionally, the actual detonation of a device has determined the transition from non-nuclear weapons to nuclear weapons status. Recently, this approach has been questioned on the grounds that there are many stages in the acquisition of a nuclear weapons capability. A nation can make all the preparations for the construction of a weapon or the testing of a device without actually “proliferating.” If it is possible to come within hours of a bomb and still not violate the NPT, the traditional definition conceals more than it reveals.

In this report, the definition of proliferation has been broadened to encompass any country that has acquired the capability to very rapidly produce a nuclear explosive device, i.e., a nation that has all the components of an explosive on hand ready for assembly. The critical element is political will. A country which has decided to acquire the components of a nuclear weapon, and has done so, is a nuclear weapons state even if the mechanics of assembling, arming, and detonating the device remain to be completed.

This does not mean, however, that the actual detonation of a device has no significance; quite the contrary. In the case of some potential Nth countries, there might be some doubt as to whether an assembled, but untested, device would actually explode. Even where no such doubt exists, there are other important considerations. The very fact that a nation has decided not to demonstrate its capability communicates a certain restraint to nervous neighbors, allies, and adversaries. As long as a device remains untested, its existence is surrounded with doubt and ambiguity—a matter of some political consequence.

Purpose and Nature of This Study

Proliferation constitutes one of the most complex and difficult issues in the public policy domain. This study seeks to facilitate an understanding of the problem and its implications, in terms of both a comprehensive overview and a detailed indepth analysis of key elements. Technological, institutional, economic, and political aspects, and the linkages among them, are examined. Policy options are outlined and analyzed in terms of three major perspectives corresponding to different weighings of the key factors discussed above. The objective is not to recommend a particular perspective or policy, but to provide the reader with the tools for informed policy choice. This report is, in particular, intended to lay the groundwork for an informed consideration by Congress of possible legislative action concerning proliferation. It is not a study of nuclear power or a comparison of its economic, social, or environmental impacts vis-a-vis alternative energy sources.

The entire report is summarized in chapter II, along with the major issues and findings. This chapter also includes an introduction to nuclear technology designed to provide a background for the nontechnical reader.

Chapter III draws on the material presented in the subsequent chapters and summarized in chapter II to present policy options available to the U.S. Government. These are analyzed as a function of different perspectives of the key factor discussed above.

An examination of the motivations for acquisition of nuclear weapons by other nations, now and in the future, is presented in chapter IV. The motivations for non-national groups to obtain nuclear weapons are explored in chapter V, along with the likelihood and nature of use by such groups. This chapter also examines the civil liberties implications of various measures that might be undertaken to control this threat.

A nation or non-national group must be able as well as willing to construct a nuclear fission explosive device. The requirements are discussed in chapter VI. Also examined are the ramifications of one possible excuse for weapons testing—peaceful nuclear explosions.

The fissionable nuclear material required to construct a weapon might be obtained by three possible routes, as described in chapter VII. One is to divert the material from a commercial nuclear power facility either covertly or by abrogation of safeguards agreements. A second is to build facilities (probably clandestinely) to produce the required material. A third is to purchase or steal either the material or actual weapons.

Safeguards play a critical role in the control of attempts to acquire nuclear weapons material. The technology and procedures of both domestic and international safeguards are analyzed in the first part of chapter VIII. The second part of the chapter deals with the international institutions involved in detecting and controlling attempts to develop nuclear weapons. An analysis of factors that could influence a nation in its selection of a route to weapons, i.e., objectives, abilities, and political situations, is presented in chapter IX.

Any control measures must also be cognizant of the characteristics of the international nuclear industry, as described in chapter X.