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Prospects for a Proliferation of Nuclear Weapons Over the Next Decade

Submitted by the
DIRECTOR OF CENTRAL INTELLIGENCE
Concurred in by the
UNITED STATES INTELLIGENCE BOARD
As indicated overleaf
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The Central Intelligence Agency and the intelligence organizations of the Departments of State, Defense, and NSA.

Concurring:

Director of Intelligence and Research, Department of State

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PROSPECTS FOR A PROLIFERATION OF NUCLEAR WEAPONS OVER THE NEXT DECADE

THE PROBLEM

To estimate the capabilities and intentions of additional countries to develop and produce nuclear weapons over the next decade and to estimate the consequences thereof.

CONCLUSIONS

A. France has already developed deliverable nuclear weapons. Communist China has conducted its first nuclear test.[1] The other nations which we now believe may develop nuclear weapons in the next decade are India, and perhaps Israel and Sweden. *(Paras. 1, 19, 23, 26)*

B. India's decision as to whether to start a nuclear weapons program will depend on its evaluation of a number of domestic and foreign factors including the scope and pace of the Chinese program, any changes in Sino-Soviet relations, and outside assurances. On balance, we believe the chances are better than even that India will decide to develop nuclear weapons within the next few years. India now has the basic facilities necessary for a modest weapons program, including a plutonium separation plant. India could produce by 1970 about a dozen weapons in the 20 KT range. Thereafter, when reactor capacity is expected to increase substantially, India's ability to produce fissionable material will increase proportionately. *(Paras. 12-19)*

[1] Separate estimates on both the French and the Chinese nuclear weapons programs are scheduled for publication later in 1964.

D. Sweden will continue its peaceful nuclear program, but we believe the chances of its developing nuclear weapons during the next decade are less than even. *(Paras. 24-26)*

E. Soviet and US policies have had some effect in hindering the proliferation of nuclear weapons. But if India, [redacted] or other technically competent nations show as much determination to develop such weapons as have France and China, the types of pressure which the USSR and the US have been willing to use to date against potential proliferators would probably not be successful. *(Para. 41)*

F. In terms of broad international implications, the impact of the proliferation which is already occurring—in France and Communist China—will be far greater than the impact of the further proliferation by smaller powers which we can foresee. In military terms, basic power relationships between the USSR and the US are not likely to be changed significantly. But the French and Chinese nuclear programs will make relations within and between alliance systems increasingly difficult in years to come. Communist China's recent detonation of its first nuclear device will have an important impact throughout Asia, and in Southeast Asia will reinforce Chinese efforts to achieve Asian hegemony through political pressures and indirect support of local "wars of liberation." *(Paras. 45-46)*

G. The military impact of proliferation among the smaller powers would derive primarily from the possibility that more aggressive activities by these states could lead to confrontations involving the major powers. US and Soviet involvement in such crises could create the potential for escalation, but both countries would have incentives to urge prudence and caution on all parties. *(Paras. 47-48)*

H. The chances of unintentional or unauthorized explosion of nuclear weapons will rise as the number of countries possessing them increases. Although the odds are strongly against it, there is some possibility that the accidental firing of a nuclear warhead into the territory of one of the major powers could touch off an immediate nuclear exchange. An accidental nuclear explosion might, particularly if property and many lives were lost, restrain some countries not involved in the accident from undertaking a weapons program. In the country where the accident occurred, domestic opposition might

become strong enough to cause abandonment of a weapons program already underway, as well as create intense pressure for the withdrawal of any nuclear weapons stationed in the area by allied nations. *(Paras. 49-50)*

DISCUSSION

I. GENERAL CONSIDERATIONS

1. Less than 20 years after the first atomic explosion, four nations (US, USSR, UK, and France) possess deliverable nuclear weapons. A fifth—Communist China—has conducted its first nuclear test.[2] Barring unforeseen technological breakthroughs, only seven other powers now have or are in the next decade likely to have the potential to develop nuclear weapons:

[redacted]

A. Technical and Economic Considerations

2. There are two main fissionable materials which a nation may use to produce fission weapons—plutonium or highly enriched U-235. Most nations could acquire plutonium more easily, since the technical information necessary to produce plutonium is openly available. Moreover, plutonium is produced in several types of nuclear reactors, of which the natural uranium-heavy water reactor and the natural uranium-graphite reactor are now quite common. To run such reactors, a nation must have or acquire uranium, and either heavy water or graphite of adequate purity. Uranium metal must be fabricated into fuel elements for the reactor. In the reactor the fuel elements become in part transformed into plutonium, which must then be extracted from the fuel elements in a plutonium separation plant. The separated plutonium may then be fabricated into components for fission weapons.

3. The technical difficulties facing non-nuclear states which might desire to develop a modest weapons capability using this method are continuing to decrease. Some of the knowledge needed for the design of relatively simple weapons is now generally available, as is enough information to make unnecessary a full series of tests to determine weapons effects. Furthermore, in the course of the next ten years an increasing number of reactors capable of producing plutonium will be built by the major industrial powers for their own use or for export to other nations. The number of nations supplying nuclear reactors and technology will also increase. As competition among suppliers mounts, purchasing nations may find it easier than in the past to buy reactors, fuel, and other essential supplies (e.g., heavy water), without having to submit

[2] NIE 13-2-64, "Communist China's Advanced Weapons Program," to be published later in 1964, will discuss Chinese nuclear capabilities in detail.

to strict safeguards.[3] In addition, the effectiveness of safeguards depends on the diligence with which they are enforced.

4. The costs of a modest program for producing plutonium weapons would not be prohibitive to most of the middle powers. A program to produce one or two low-yield (about 20 KT) plutonium fission weapons per year would cost $140 million to $180 million through the first detonation, and $20 million to $30 million a year thereafter. However, the cost increases markedly for a more than minimum program. For example, a program to produce 15 to 30 plutonium fission weapons a year would probably cost $600 million to $700 million, plus subsequent annual operating expenses of about $100 million. (All figures in this paragraph are exclusive of delivery vehicles.)

5. Highly enriched U-235 can also be used in an initial fission weapons program. Until recently, however, the most feasible method of producing this material from natural uranium has been the very expensive and technically difficult gaseous diffusion process. The major nuclear powers have built gaseous diffusion plants (and France is building one) to produce the U-235 needed for a large and sophisticated weapons program.[4] But other countries which might initiate a weapons program in the next decade would regard a gaseous diffusion plant as an overly long and expensive road to a modest capability.

6. Recent technical studies indicate that the ultracentrifuge process may ultimately provide a quicker and less expensive method of producing moderate amounts of highly enriched U-235. The US has never constructed a production-size ultracentrifuge facility, but research has shown the process to be feasible. The cost of a plant for a small weapons program would be at least $100 million—less than a gaseous diffusion plant but more than a small plutonium production program for any country which already had a suitable reactor. Information on recent developments in ultracentrifuge technology is not generally available. Only West Germany and the Netherlands among the non-nuclear countries appear far advanced in the field. If advanced ultracentrifuge technology becomes more readily available, however, the chances that a nation could develop nuclear weapons clandestinely, right up to the time of the first test, will be somewhat greater than they are now. An ultracentrifuge facility would require only a small building; it would have no distinguishing external

[3] The term "safeguards" refers to the control of nuclear materials, equipment, facilities and information to assure their use only for peaceful purposes. Controls required by the US and other major supplying countries generally include the submission of periodic reports and the right of inspection for on-the-spot verification of peaceful use. EURATOM applies similar controls to those reactors and materials which Common Market recipients have agreed to place under its jurisdiction. An effort is being made to have such safeguards applied universally and administered by the International Atomic Energy Agency (IAEA). Specific sanctions for the violation of safeguards range from requiring the return of the assistance to notification to the UN. While there are no iron-clad controls to prevent a recipient of material from violating its agreement, suppliers could, of course, refuse to supply further material or technical assistance.

[4] An estimate on Communist China's nuclear weapons program is scheduled for later in 1964.

features and would not require great amounts of power; and it might be built and operated without attracting attention.

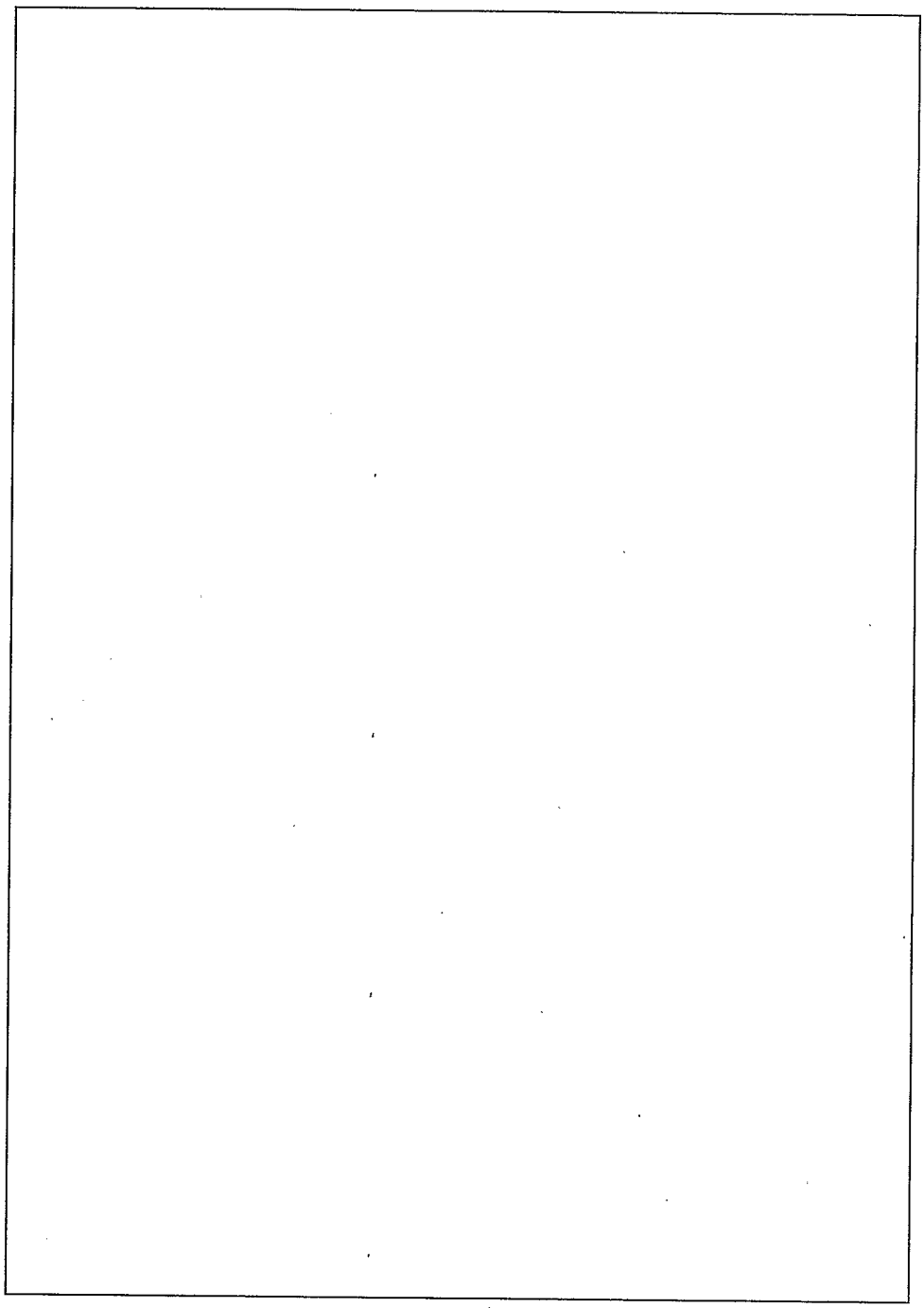
7. It is theoretically possible to develop thermonuclear weapons using plutonium alone. A program to develop such weapons would have to be preceded by a fairly lengthy period (3-5 years) of development and testing of fission devices. Although the technology of producing thermonuclear weapons has been held more closely by the present nuclear powers than has information on how to develop fission weapons, scientists of various other nations, given time, will be able to master the technology for themselves. Taking into account the known reactor programs of non-nuclear powers, the need of most of the important ones to import nuclear fuel and the safeguards in force, we do not believe that any of the non-nuclear powers [redacted] would be able in the next four or five years to produce enough plutonium to test and fabricate thermonuclear weapons. Ten years hence, the difficulties associated with developing thermonuclear weapons might be significantly less than they are today.

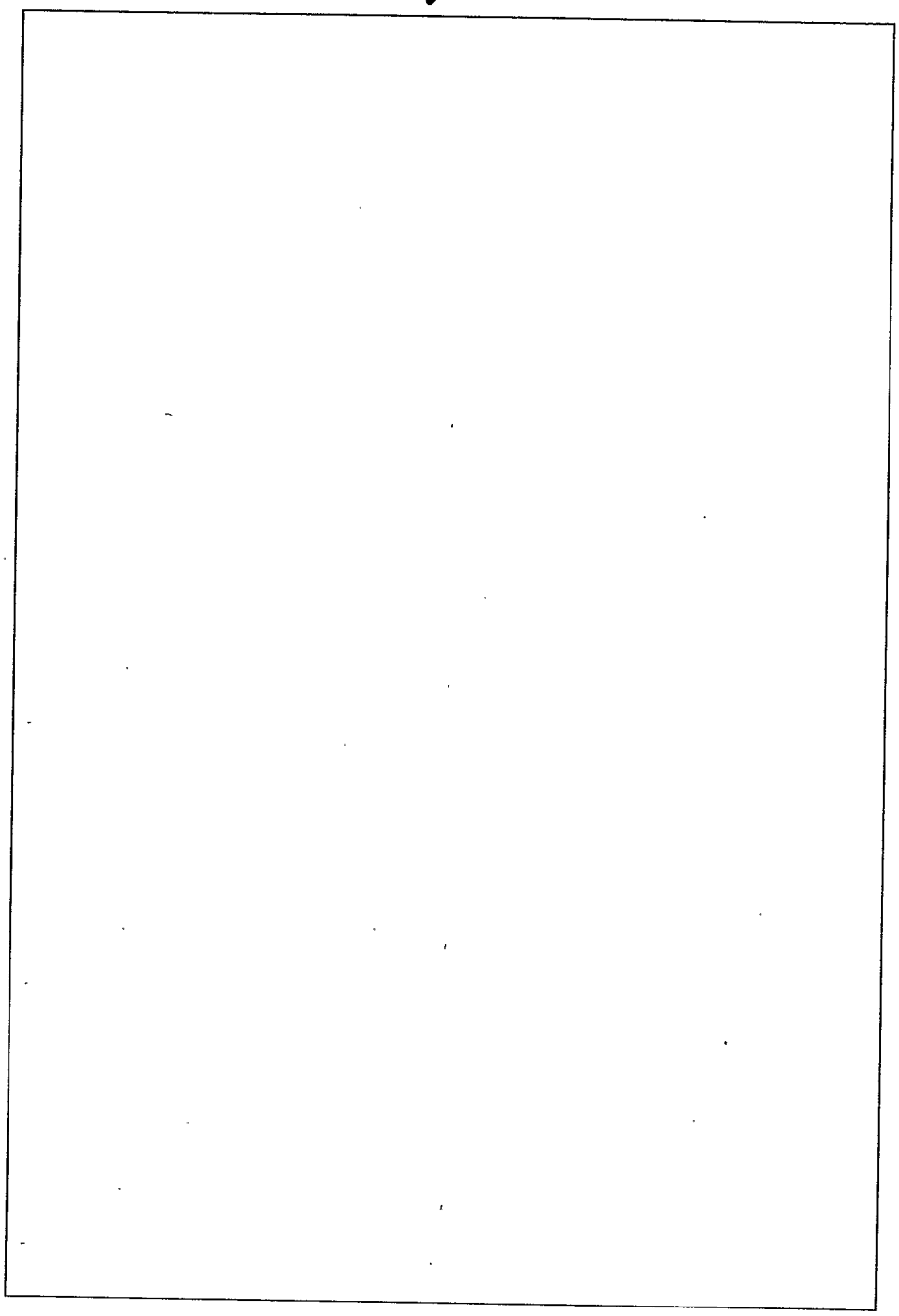
8. The 1963 partial nuclear test ban treaty, which permits only underground tests, does not pose a significant technical problem for a small-scale weapons program. Although underground testing increases somewhat the costs and difficulties of developing nuclear weapons, the differences, as compared with atmospheric testing, are not great. Instrumentation of underground tests to obtain the essential data needed to produce relatively simple weapons would not be too difficult. In addition, a fairly large volume of unclassified information is avalable on US underground tests which would probably enable a nation to determine the depth and size of hole necessary for devices of various sizes, and for soil or rock of various types.

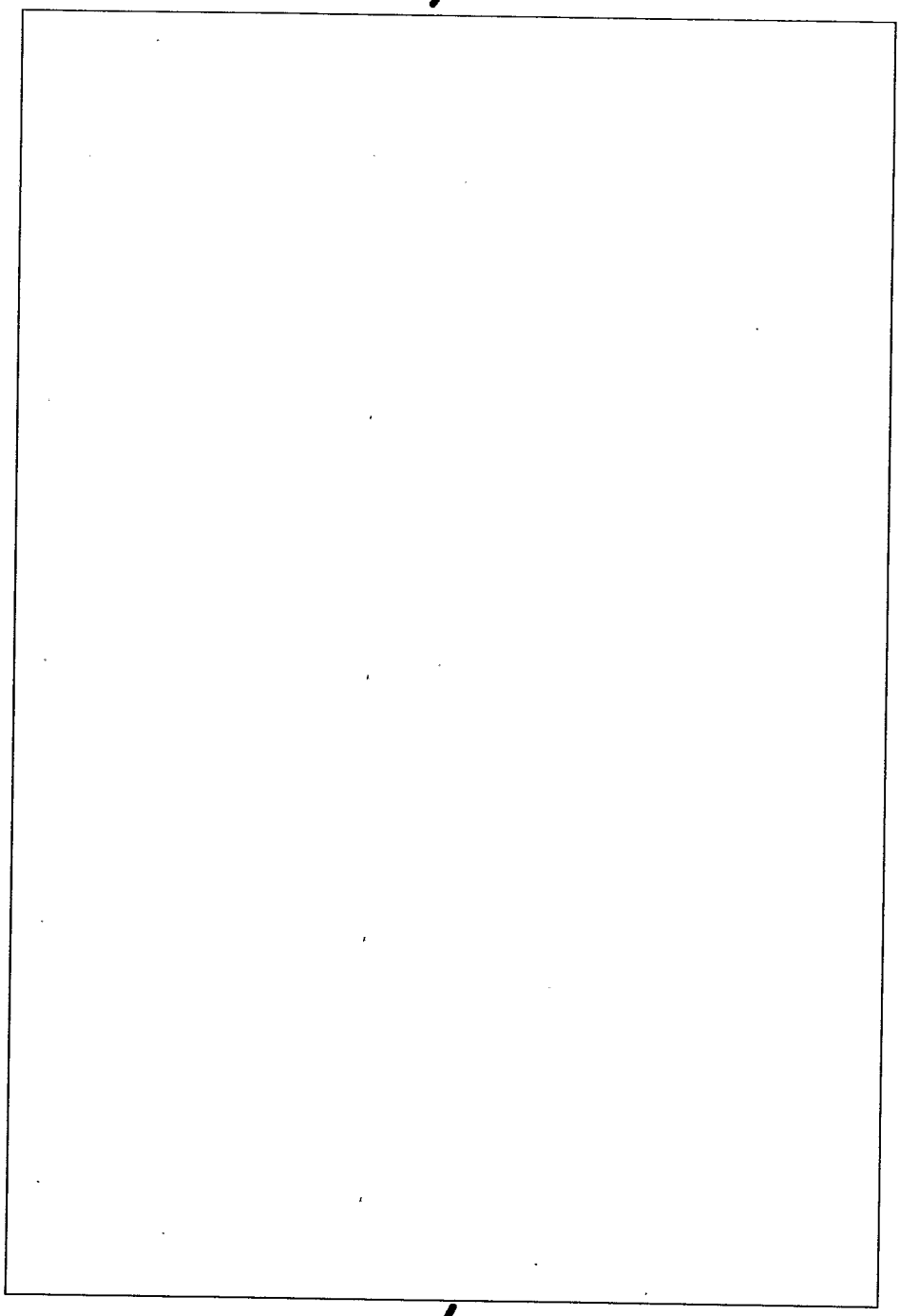
B. Other Factors

9. We do not know that any nation which has not tested a device has decided to embark on a weapons program. Although some countries may change their policies, we believe that over the next ten years only [redacted]

10. The acquisition of nuclear weapons by additional countries will be a factor—but not necessarily a decisive one—tending to induce others to undertake a nuclear weapons program. The Communist Chinese program will be a very important element in the calculations of India and Japan, [redacted] In addition to such regional situations, a successful nuclear weapons program in any nation will probably reduce political and psychological inhibitions against a weapons program in other countries. However, the decision of any nation to enter the nuclear weapons field will depend on a complex mixture of national, regional, and global factors which will differ in each case.







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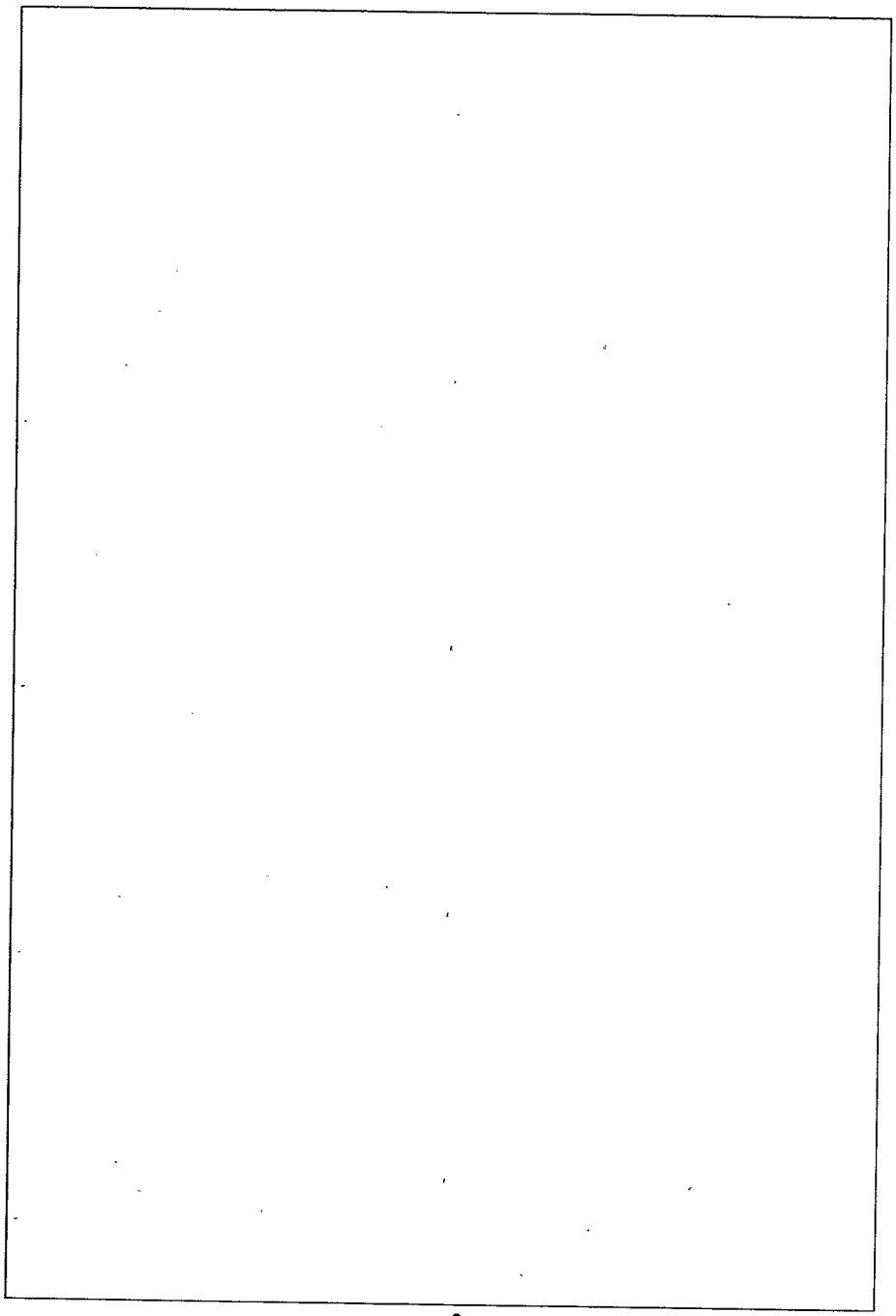

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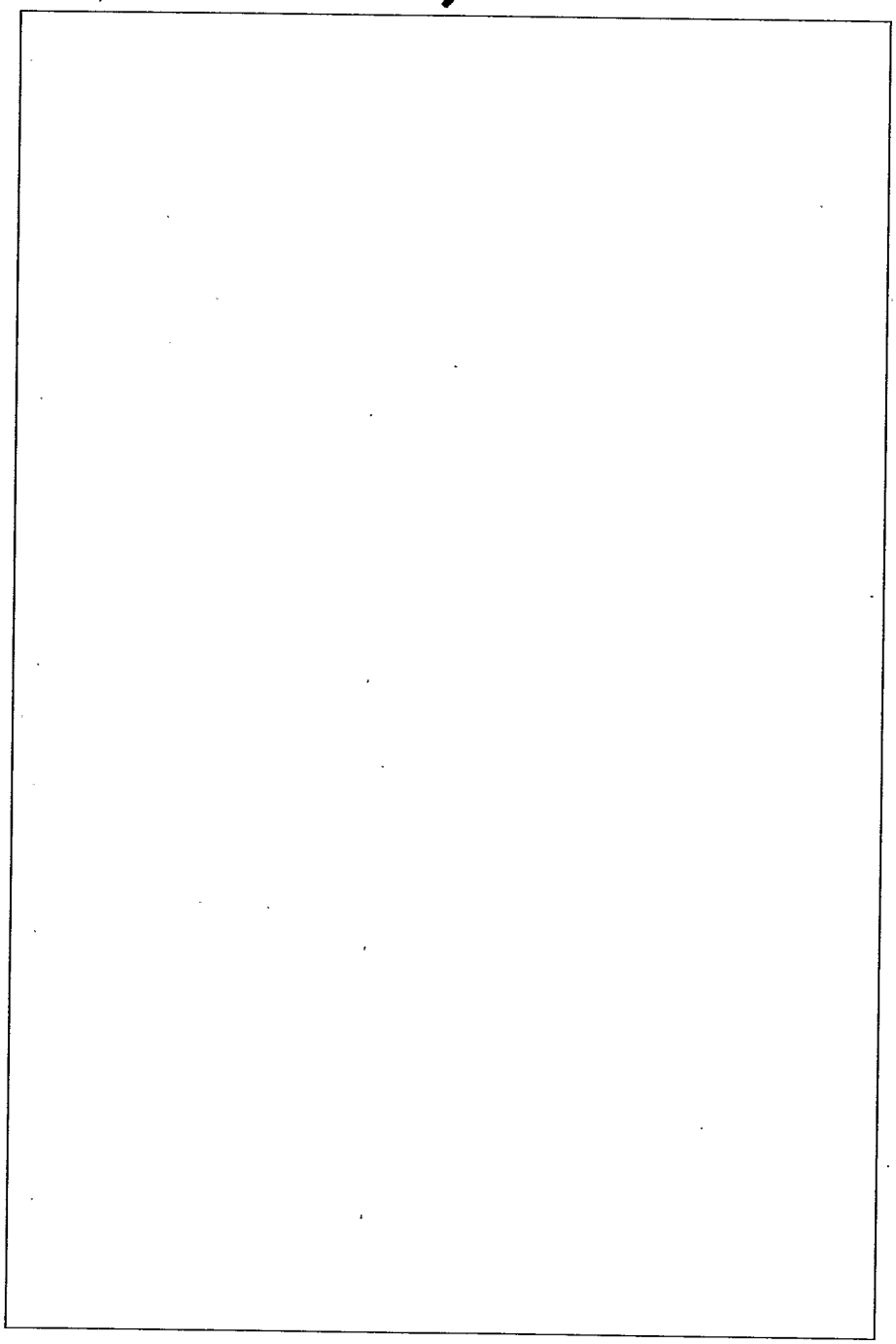

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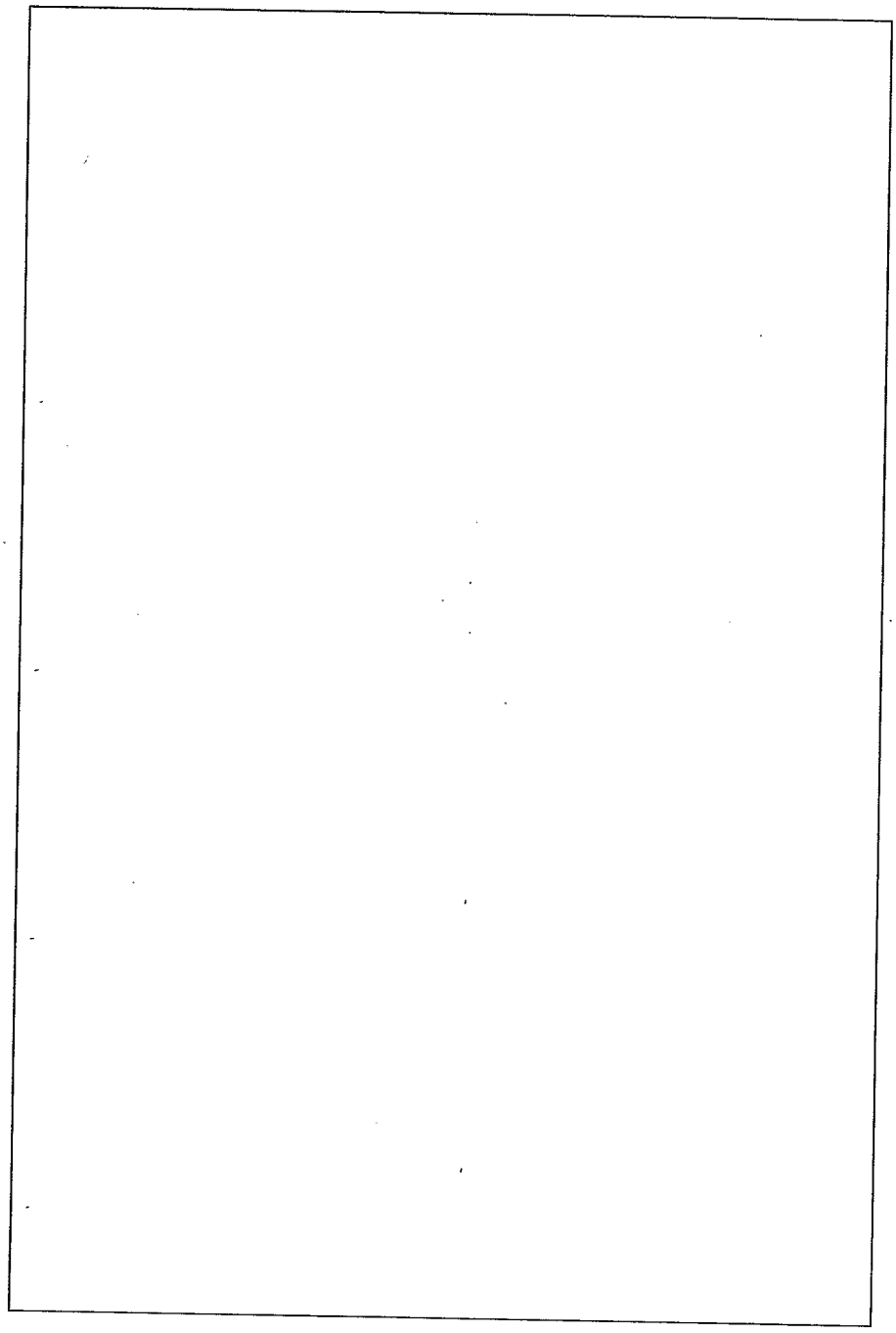

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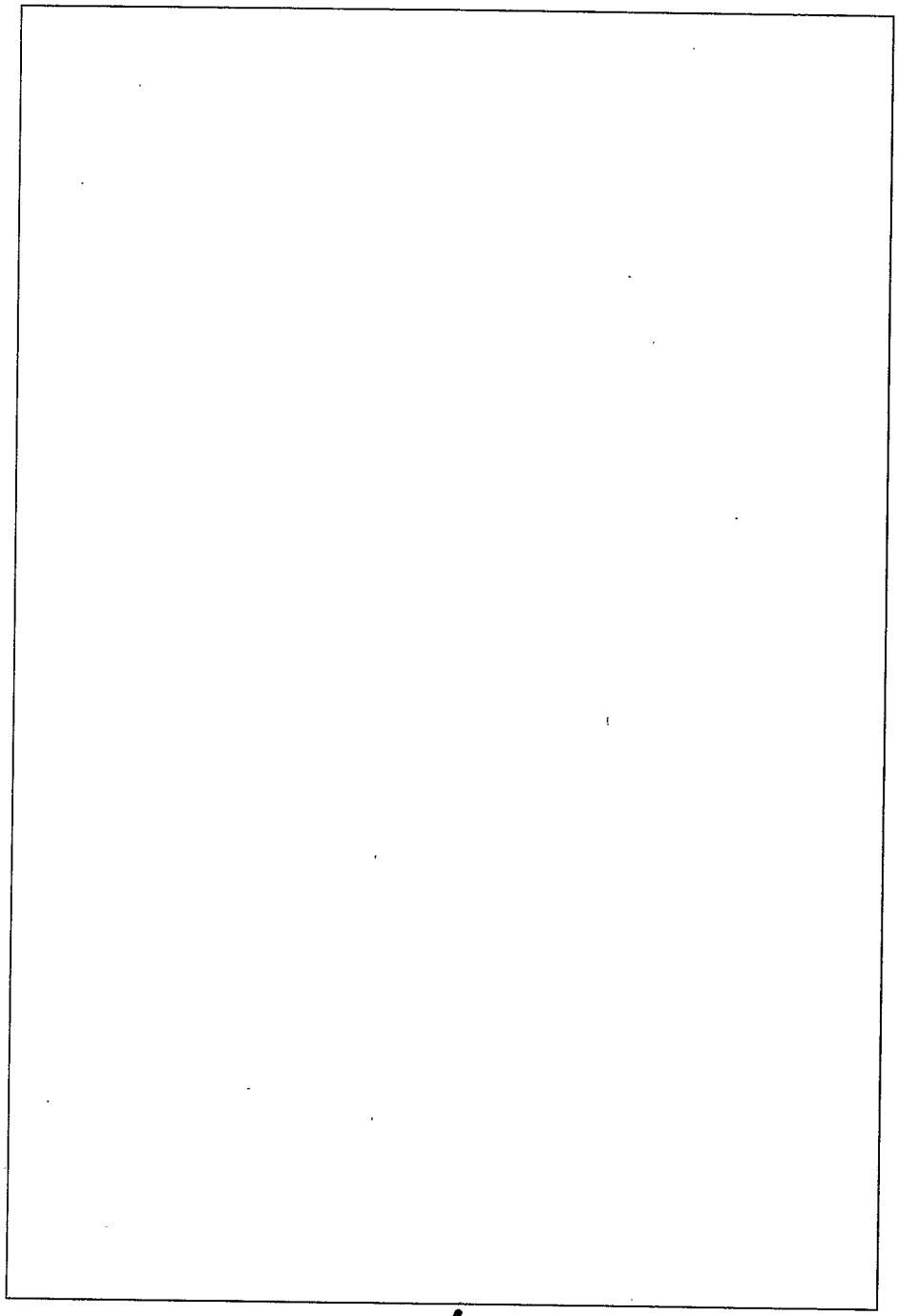

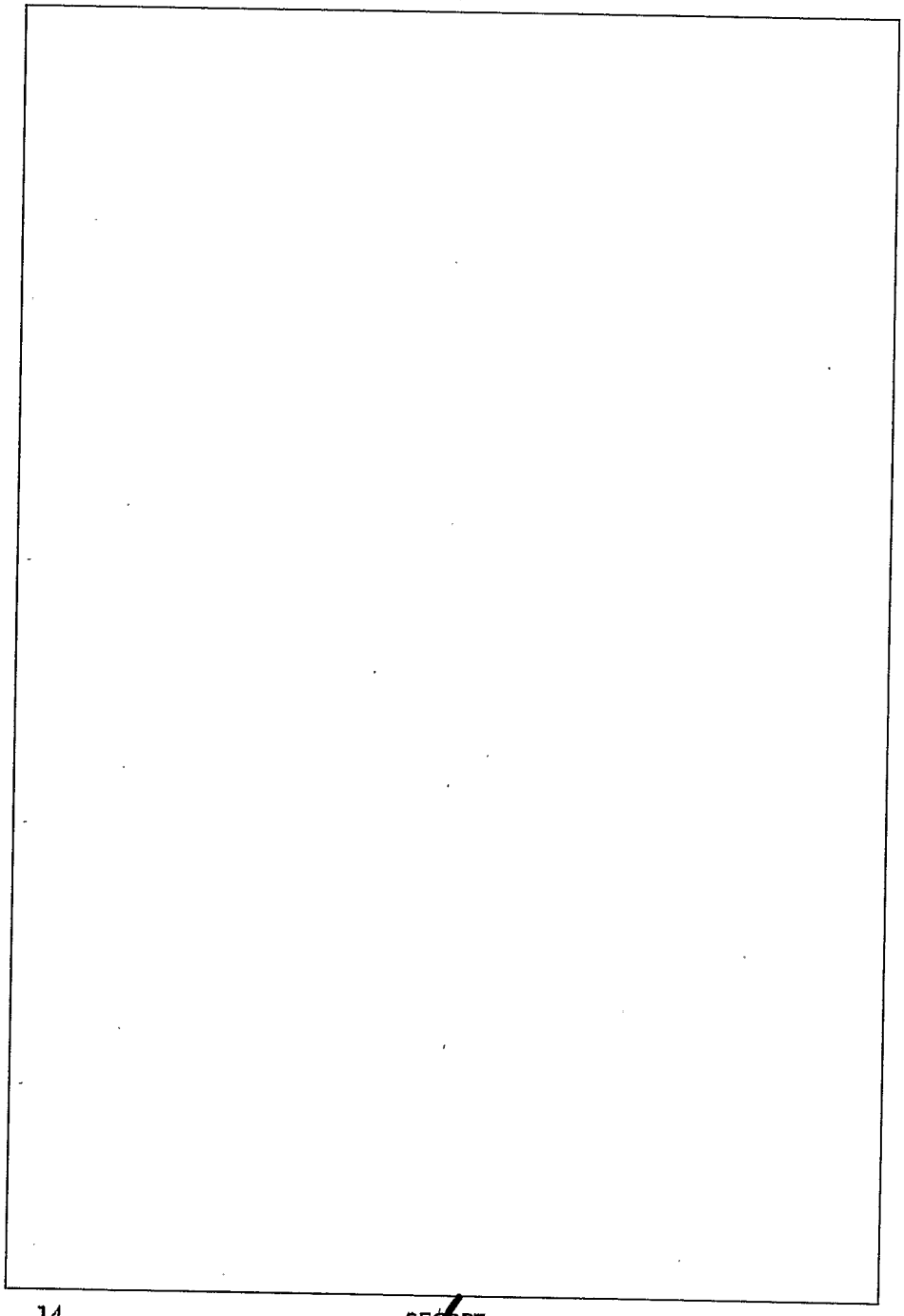

III. POLICIES OF THE PRESENT NUCLEAR POWERS TOWARD PROLIFERATION

40. As the above survey shows, we believe that in the foreseeable future [redacted] need to be considered seriously as potential nuclear powers. Despite Soviet and US inability to forestall a Chinese nuclear program or to prevent the French from developing a weapon, we believe the Soviets consider it in their interest to prevent proliferation, though Soviet anxieties doubtless vary with the circumstances of the country concerned. The Soviets are therefore unlikely to help other countries develop their own nuclear weapons. West Germany will continue to be the focal point of their concern, and the Soviets can be expected to make major efforts to head off German acquisition of nuclear weapons.

41. Soviet and US policies have had some effect in hindering the proliferation of nuclear weapons. If, [redacted] other technically competent nations show as much determination to develop nuclear weapons as have France and China, the types of pressure which the USSR and the US have been willing to use to date against potential proliferators will probably not be successful. The 1963 partial test ban treaty will continue to exert a restraining influence politically and psychologically, and if a comprehensive test ban were signed this would constitute an even greater deterrent. However, the limitations of these forms of deterrence are apparent from the fact that [redacted] and numerous other countries made clear at the time of signing that the partial test ban treaty would not necessarily prevent them from carrying out a weapons program.

42. Great Britain has had a strong interest in a non-diffusion treaty, and has long been more willing than the US to meet Soviet requirements for such an agreement. [redacted]

43. France's attitude toward nuclear proliferation is ambiguous. General de Gaulle has indicated that he believes no nation in this age can be fully independent unless it has a nuclear weapons capability. [redacted] De Gaulle has manifested no objection to the development of a Chinese Communist capability. [redacted]

IV. BROAD IMPLICATIONS OF NUCLEAR PROLIFERATION

44. The implications of nuclear proliferation for US security remain basically as set down in NIE 4-63.[5] The following paragraphs summarize and bring up to date the analysis contained in that estimate.

45. The impact of the proliferation which is already occurring—in France and Communist China—will be far greater than the impact of any further proliferation by smaller powers which we can foresee. The French and Chinese nuclear programs have already intensified the strains within the major power groupings and will continue to do so. Their nuclear programs are, in a sense, acts of defiance of the US and the USSR, and French and Chinese possession of nuclear weapons will be one of the factors tending to make relations within and between alliance systems increasingly difficult. Acquisition of even a primitive nuclear capability will enhance Communist China's claim to great power status, and will probably strengthen Peiping's hand somewhat in its contest with Moscow for leadership of the world's Communist parties.

46. The Chinese Communist nuclear program, in addition to its effect on India and perhaps eventually Japan, will have an important impact throughout Asia. We do not believe that Communist China's recent first nuclear detonation or the acquisition of a modest nuclear weapons capability will cause Peiping to adopt a policy of open military aggression, or to take significantly greater military risks to neutralize the US presence in Asia. China's leaders would recognize that their limited capability did not significantly change the military imbalance between themselves and the US. On the other hand, their possession of nuclear weapons would reinforce their efforts to achieve Asian hegemony through political pressures and indirect support of local "wars of liberation." Neighboring governments and peoples would probably feel that the relations of power had changed, even if there were little immediate change in the realities of power. This would result in increased pressures in South Asia to accommodate to Chinese demands.

47. In military terms, the nuclear proliferation which is occurring or likely to occur over the next ten years will almost certainly not upset the overall power relationship between the USSR and the US. None of the new or prospective nuclear powers will acquire capabilities which, if added to those of the US or the USSR, would significantly affect East-West military relationships or bulk large as an independent force compared with the US or the USSR. The military impact of such proliferation as takes place will come primarily from the possibility that hostilities arising out of existing or future regional controversies

[5] NIE 4-63, "Likelihood and Consequences of a Proliferation of Nuclear Weapons Systems," dated 28 June 1963, SECRET.

could escalate into a serious confrontation involving the major powers. We do not believe, however, that the acquisition of a modest nuclear capability by the few nations where this is likely in the next decade would produce more aggressive military behavior. The very presence of nuclear weapons might even bring a new sense of prudence into the calculations of regional rivals when one or another is considering the aggravation of a controversy.

48. Should regional crises actually erupt into open conflict, the probable effect of nuclear weapons in the hands of one or more of the antagonists is more difficult to estimate. The situation would clearly be more dangerous than in the absence of such weapons, and US and Soviet involvement in the local crisis might be more likely. This, in turn, would create the potential for escalation into general war. However, the possession of nuclear weapons by the regional antagonists would almost certainly introduce elements of prudence into their own calculations, and the involvement of the US and USSR could be expected to add to the forces of restraint. The pressure of world opinion for restraint would presumably also have some effect on the regional antagonists. Moreover, we do not believe that even if one or the other of the nations involved actually used a nuclear weapon, the major powers would necessarily allow the crisis to develop into a major East-West confrontation.

49. As the number of countries with nuclear weapons increases, the risk of unintentional or unauthorized detonation of such weapons will also rise. Elaborate safety measures such as those developed by the US are expensive and temptingly easy to dispense with, even by a country with considerable financial and technological resources. The accidental detonation of a nuclear weapon in any part of the world could have far reaching consequences. Unless the circumstances were very quickly explained, understood, and believed, the reaction of peoples and perhaps governments would probably be confused, even panic-stricken. If a missile with a nuclear warhead was accidentally fired by any nation into the territory of one of the major powers, there is some chance that a nuclear exchange would be touched off immediately. The odds, however, are strongly against this; the major powers recognize that the diffusion of nuclear weapons will increase the chances of an accidental detonation and would probably react cautiously to any such event.

50. In the case of an accidental nuclear explosion on the soil of the owner, the consequences would depend on the attendant circumstances. In general, the impact of any major nuclear accident on world opinion, particularly if property and many lives were lost, might serve to restrain some other countries not involved in the accident but considering a weapons program. In the country where the accident occurred, domestic opposition might become strong enough to cause abandonment of a weapons program already underway. There would also be strong public pressure in the area of an accident to remove all nuclear weapons, regardless of origin. For example, a French nuclear accident might not only affect the future of the French program but also provide an opportunity which could be exploited by those who want US nuclear weapons withdrawn from Europe.

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