

October 21, 1964

**National Intelligence Estimate NIE 4-2-64,
'Prospects for a Proliferation of Nuclear Weapons
Over the Next Decade'**

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Summary:

This US analysis of the likelihood of nuclear proliferation during the next decade was finished only days after the first Chinese nuclear test on 16 October. The report analyses the implications of this test, as well as programs in India, Israel, Sweden, West Germany, Italy, Japan, Canada, and others. The National Intelligence Estimate (NIE) argued that India was the only new state likely to develop nuclear weapons, concluding that "there will not be a widespread proliferation ...over the next decade."

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NUMBER 4-2-64

**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
21 OCTOBER 1964

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The Central Intelligence Agency and the intelligence organizations of the Departments of State, Defense, and NSA.

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Director of the National Security Agency
The Atomic Energy Commission Representative to the USIB

Abstaining:

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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*)

C. The Israelis probably have not decided to develop nuclear weapons. If Israel estimates that the threat from Arab states is increasing beyond Israel's ability to cope with it by conventional means, and in the absence of strong US pressures or explicit US security

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

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guarantees, we believe that the chances are better than even that Israel will start a nuclear weapons program. (*Paras. 20-23*)

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, Israel, Sweden 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

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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)

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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.³ 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: India, Israel, Sweden, West Germany, Italy, Japan, and Canada. These nations are discussed in Section II.

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

³NIE 13-2-64, "Communist China's Advanced Weapons Program," to be published later in 1964, will discuss Chinese nuclear capabilities in detail.

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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

³The 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.

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

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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 except Canada 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 available 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 three additional nations—India, Israel, and Sweden—need to be considered seriously as potential nuclear powers.

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, and an Israeli program would affect the UAR. 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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II. SURVEY OF INDIVIDUAL COUNTRIES

11. The seven nations with the technical and economic capability to develop nuclear weapons already have substantial nuclear research and power programs, as follows:

Country	Estimated Total Expenditures to End 1964 <i>Million</i> <i>US\$</i>	Year Program Started	ESTIMATED PRESENT ANNUAL OUTLAYS	
			<i>Million</i> <i>US\$</i>	Percent of 1963 GNP
				<i>In cur- rent prices</i>
India	220	1954	63	0.2
Israel	110-120	1952	20	0.8
Sweden	285	1945	45	0.3
West Germany	850	1956	200	0.2
Italy	520	1952	60	0.1
Japan	440	1954	82	0.2
Canada*	500	1942	60	0.2

*The figures for Canada do not include expenditures for mining and concentrating uranium exported to the US and UK, which will total about \$1.5 billion by the end of 1964 and currently are running at about \$60 million per year.

A. India

Technical and Economic Factors

12. India now possesses all the basic facilities necessary to produce plutonium. Although its research and nuclear power programs are not large, they are well advanced. Domestic uranium ore reserves are adequate for all presently projected needs, and a uranium ore processing mill is scheduled for completion in 1965. Until its mining operations are expanded sufficiently to meet its needs, India will probably continue to be able to import uranium, though under safeguards of varying degrees of effectiveness. The country plans to build at least three sizable nuclear power reactors in the next four to eight years, and has already in operation three research reactors. One of the latter—the Canada-India Reactor (CIR)—is capable of producing annually enough plutonium for one or two weapons in the 20 KT range. There are no safeguards on either the uranium or the heavy water now used in this reactor to hinder the Indians from embarking on a weapons program. India also has uranium metal and fuel element fabrication plants, and a heavy water plant.

13. In addition, India now has a plutonium separation plant which was completed in the first half of 1964. The Indians have stated that this plant could process 30 tons of material annually. It may be possible, however, to increase the capacity to several times this figure. Even the smaller capacity appears excessive in relation to the present needs of India's peaceful nuclear program. The Indians could have future peaceful uses for this plant, but the plant places them in a favorable position to separate plutonium for weapons if they so desire. The only nations in addition to India now possessing plutonium separation

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plants—other than pilot facilities—are the major nuclear powers and France, and probably Communist China. India also has a large number of specialists working on plutonium metallurgy. India's CIR reactor has been operated in a manner that favors the output of plutonium suitable for weapons, but which is also useful for other purposes. The Indians have indicated that they want plutonium of this grade for research on fast breeder reactors which they hope to develop to exploit their extensive thorium reserves. In any case the present manner of operating the reactor enhances New Delhi's ability to move promptly into a weapons program.

14. We believe that India, given the facilities it now has, could produce and test a first nuclear device in one to three years after a decision to do so. India signed the 1963 partial test ban treaty, but it has areas where underground testing would present no great difficulties. A weapon deliverable by the Indian Air Force's Canberra light bombers could probably be produced about two years after the first test. Until near the end of this decade, India will be able to produce fissionable material only from the CIR reactor. Consequently, 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.

15. The economic burden in developing a few simple fission weapons and a delivery capability based on presently available aircraft would not be great. The cumulative total expenditures on India's nuclear programs to date have been about \$220 million, and \$63 million have been allocated in the current fiscal year for nuclear development. Expenditures for a modest weapons program (up to testing of the first device) would total no more than \$30 million to \$40 million. The necessary funds could be made available by diverting money currently allocated to nonmilitary areas of nuclear research.

The Indian Political Decision

16. It seems clear that India's nuclear program has been carried out in such a way as to allow New Delhi—if it so decides—to move into a modest weapons program with little delay and moderate expense. We have no evidence that Indian scientists are working in the field of weapons design, and we believe that the Indian Government has not so far made the decision to build a weapon. India traditionally has opposed nuclear weapons on moral and political grounds, and top government officials have recently publicly reiterated that India does not intend to make nuclear weapons. However, now that the first Chinese test has occurred, internal pressures will probably rise in India for some countervailing force.

17. The Indian decision will depend on a number of factors. One of the most important will be the pace and scope of the Chinese program and the nature of Chinese policy. If the Chinese carry out a vigorous test program and appear to be moving successfully toward an operational weapons capability, and if they continue their truculent foreign policy, the pressures within India

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for a weapons program will grow stronger. Another important factor will be the development of Soviet policy under the new leadership. Evidence of a move toward Sino-Soviet rapprochement, even if not accompanied by a lessening of Soviet military and other aid to India, will likewise tend to make India feel that it must expand its own military capability.

18. Another factor will be the importance the Indians attach to assurances from the US and others. It is conceivable that the Indians would decide not to develop nuclear weapons if they were able to obtain unequivocal assurances from the US or the USSR to come to India's assistance in case of nuclear attack from Communist China. The chances of their abstaining from weapons development might be somewhat greater if they were able to obtain such an assurance from both the super powers. They would not, however, be optimistic that assurances which they considered adequate could be obtained. India probably could not be persuaded to give up its freedom of choice by any proposals for an atom-free zone in Asia, unless the Chinese Communists were included in the zone and unless the agreement set up strong inspection and control arrangements.

19. We believe that India will at a minimum continue to build up its capability to start a weapons program promptly after a decision to do so. This will probably include studies of designs and techniques preliminary to a weapons program. An actual Indian decision to produce weapons, of course, will depend on the Indian Government's evaluation of a variety of internal and external factors, including those mentioned above. We cannot estimate with a high degree of confidence how these factors will evolve. However, on balance we believe the chances are better than ever that India will decide to develop nuclear weapons within the next few years. The weapons India could produce by 1970 would be of relatively large dimensions and unsophisticated design. Indian delivery capabilities would probably be limited to the Canberra bombers presently possessed by the Indian Air Force, or to other aircraft which India might be able to purchase, such as the US B-47 or Soviet TU-16 (Badger) medium bombers. We believe that it is beyond India's technical and economic capabilities to develop either very small tactical or high yield fission weapons, thermonuclear weapons, or missile delivery systems within the period of this estimate.

B. Israel

20. Israel has not traveled as far as India along the road toward acquiring a ready potential for nuclear weapons production. To date, Israel has imported its uranium. Beginning in mid-1965, however, enough uranium will be mined domestically to supply Israel's planned nuclear research program, with enough left over to supply a modest weapons program. The country has two research reactors, one of which—a heavy water moderated reactor built with French assistance at Dimona—could produce enough plutonium annually for one or two nuclear weapons in the 20 KT range. The French have apparently established safeguards on the natural uranium fuel elements which they have supplied for the initial loading of the Dimona reactor, but there will be no safeguards

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on subsequent loadings which the Israelis themselves will produce. Furthermore, there are credible reports that Israel is buying uranium concentrates from Argentina without effective safeguards. Israel has constructed a uranium metal plant, and is building a fuel element fabrication facility which should be completed by the end of 1964. Israel does not yet produce heavy water, but has a supply purchased from Norway under safeguards which are not very stringent.

21. Israel's major deficiency, in terms of a weapons program, is the lack of a plutonium separation plant. Israel could build such a plant in about two years, and could test a first nuclear device shortly thereafter. At least another two years would be needed to develop a weapon suitable for delivery by the only bomber in the Israeli Air Force, the Vautour IIB, since this aircraft has a bomb-bay requiring a weapon of fairly small diameter. If Israel could adapt its aircraft or acquire others capable of carrying larger diameter bombs, it could probably have a deliverable weapon within a year or so after testing a first device. Israel would probably need at least four years after testing its first device to produce a nuclear warhead compatible with the 270 n.m. missile which is being developed for the Israelis by France. This length of time would be required partly because the slow rate of Israeli plutonium production would hinder the necessary testing program. Outside assistance, of course, would shorten the timetable.

22. Israel's nuclear program will have cost \$110 million to \$120 million through 1964. Current expenditures are about \$20 million per year. The additional cost of a plutonium separation plant for a modest weapons program would be \$15 million to \$20 million. Research, development, and fabrication of the first device would add \$30 million to \$40 million. Such a program would require annual expenditures over three years of one to 1.5 percent of Israel's current GNP, a heavy but tolerable economic burden.

23. The Israelis probably have not yet decided to develop nuclear weapons. However, pressures in Israel for a weapons program would become very strong if the Israelis came to believe that they could not otherwise maintain their military superiority over the Arab states. Such pressures could arise if the military capabilities of the Arab states were significantly increased through the development of the United Arab Command into an effective organization. They could also arise if the Arab states, particularly the UAR, acquired large quantities of offensive weapons, or if the UAR appeared to be developing a nuclear capability. Failure of Israel's continuing efforts to acquire what it believes to be adequate quantities and types of conventional arms would also increase pressure on the Israeli Government to develop nuclear weapons. If Israel estimates that the threat from Arab states is increasing beyond Israel's ability to cope with it by conventional means, and in the absence of strong US pressures or explicit US security guarantees to Israel, we believe that the chances are better than even that Israel will start a nuclear weapons program. If Israel came to believe that the UAR was developing a nuclear capability, Israel would almost certainly do so.

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C. Sweden

24. Sweden's nuclear research and power program is highly advanced technically and scientifically. Sweden already has most of the necessary facilities for a weapons program, including seven research reactors and one 65 MWt power reactor which is operating without safeguards and could be redirected for the production of plutonium. The country has for some time had plans to build a plutonium separation plant, although there is no indication that construction will start in the near future.

25. Swedish capabilities for nuclear weapons production have increased in the past year, but public opposition to a weapons program probably has also increased. The view is widely held in Sweden, and has increased in strength since the signing of the partial test ban treaty, that nothing should be done to encourage proliferation of nuclear weapons, but that Sweden instead should use its influence to get the present nuclear powers to agree on further controls over these weapons. The Swedish military leadership, on the other hand, continues to argue that the partial test ban treaty does not increase Swedish security from possible Soviet attack, and that a nuclear weapons capability is essential to an effective Swedish defense posture.

26. The Government of Sweden has maintained its freedom to establish a nuclear weapons program if and when it deems such a program necessary. The Social Democratic Party, which was returned to power in a recent parliamentary election, is on record as wishing to postpone a decision on nuclear weapons as long as possible. However, if after some time there has been no progress by the US or the USSR toward a comprehensive test ban or disarmament arrangements, the Swedish Government will probably come under increasing military pressure to initiate a weapons program. On balance, we believe the chances that the Swedish Government will decide upon a nuclear weapons program are less than even during the next decade. Should Sweden decide to develop nuclear arms, a first test could come shortly after the completion of a plutonium separation plant, which would take at least two years to build. Given the high level of Swedish scientific and technical competence, relatively sophisticated fission weapons could be developed in another two or three years.

D. West Germany

27. West Germany has a larger nuclear research and power program than any other country not already possessing nuclear weapons, but shows no intention of developing a weapons capacity. The country has 14 research reactors and four sizable power reactors either completed or under construction. Government and industry are convinced that nuclear power soon will become competitive with conventional power and are bending every effort to make Germany a leading world supplier of reactor and nuclear power technology. By the end of 1964 West Germany will have spent \$850 million on its nuclear program. Current annual expenditures are running at about \$200 million per year and are expected

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to rise, with industry rather than government accounting for most of the increase. Erection of nuclear power plants alone will probably account for expenditures of about \$150 million in the years 1965 through 1968, and only \$10 million of this amount will be invested by the government.

28. The German program is not oriented toward the development of nuclear weapons, and despite its size the German effort could not be converted quickly and easily to weapons production. West Germany has no known domestic uranium deposits of significance. The fuel for all present and planned German reactors is under EURATOM safeguards. Another obvious restriction is that Bonn formally pledged to its West European allies in 1954 that it would "not manufacture on its territory any atomic weapons, chemical weapons, or biological weapons."

29. West German public opinion also is strongly against a national nuclear weapons program, although a minority is attracted by the possibility of organizing an independent European (in effect, Franco-German) nuclear force. For several years there have been rumors and reports that the French have approached the Germans for financial assistance in the French nuclear program. Our evidence is still not sufficient to corroborate either these reports or French and German denials of the reports. We believe, however, that if such overtures have been made, the Germans have rejected them.

30. Most West German leaders appear willing to remain dependent on the US for military security, and have espoused the US-sponsored MLF as a means of entree into the nuclear affairs of the Western Alliance. Even if the MLF project should fail, any German desire for a nuclear tie with France or for the development of a national nuclear capability probably would not increase to the point of causing Germany to change its present foreign policy or security posture, for some years at least. Most Germans would remain unwilling to damage their close alliance with the US, which they regard as vital to their security, and would continue opposing either of these courses of action. Over the longer run, if there were fundamental changes in the present Western security system, the West German attitude toward acquiring nuclear weapons might change.

31. Should West Germany undertake a national nuclear weapons program, ignoring treaty restrictions and safeguard agreements on nuclear raw materials, it could develop a first device or weapon several years after decision. Germany could follow the plutonium route to weapons and build a plutonium separation plant for the purpose. Because of its advanced research on ultracentrifuges, however, Germany is one of very few countries which could in the foreseeable future develop this process to the point of being able to produce enough highly enriched U-235 for an initial fission weapons program. If Germany decided to develop nuclear weapons, it could undertake a larger program than any other present non-nuclear power without economic strain, provided the necessary uranium were available.

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E. Italy

32. Italy's nuclear program, smaller than that of West Germany, is aimed almost exclusively toward research and the production of electric power. Italy now has three sizable power reactors in operation or nearing completion. Italy must import its uranium. Both the fuel and the reactors are covered by EURATOM safeguard provisions and could not be used legally in a weapons program. While the Italian Defense Ministry may be carrying on some theoretical research on nuclear weapons, the only program of direct military application concerns research and design work on nuclear propulsion systems for ships. Italy is now spending about \$60 million a year in the nuclear field, and expenditures will probably not rise rapidly through 1968. If present plans for the large-scale construction of nuclear power plants in the 1969-1973 period are carried out, annual spending in these years could rise to \$200 million.

33. Political opinion in Italy continues to be strongly against a national nuclear weapons program. The recent swing to the left in Italian politics, particularly the present Socialist participation in the government, and Italy's continuing economic and financial problems work against a decision to produce nuclear weapons. In the unlikely event that Italy should decide to initiate a weapons program, several years would be required to fabricate a first test device.

F. Japan

34. Japan has an advanced nuclear research and power program about as large as that of Italy and theoretically could produce nuclear weapons by the end of this decade if it desired. Like Italy, however, Japan does not have sufficient uranium for a weapons program. A major problem would be to locate sources of uranium free of safeguards. Current annual expenditures by government and industry in the nuclear field exceed \$80 million. This amount will probably increase substantially over the next decade. A program to produce a few nuclear weapons by 1970 could be carried out without major increases in the anticipated level of annual expenditures, by diversion of funds from projects now planned.

35. The memory of Hiroshima and Nagasaki remains vivid in Japan, and public resistance to nuclear weapons is stronger there than in any other country. Although some Japanese military leaders apparently now favor possession of nuclear weapons, the overwhelming majority of the political leadership is opposed and probably will remain so for the foreseeable future. Toward the end of the ten-year period covered by this estimate, the situation may change. If, after Communist China, India should develop nuclear weapons, the feeling may grow in Japan that it too, as a major Asian power, must have a nuclear capability. This would require the acquisition or development of aircraft or missiles of greater range than anything in the present Japanese Self-Defense Force. We cannot exclude the possibility of such major changes in Japanese public opinion and military policy, but we believe that, even ten years hence, the odds are against them.

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G. Canada

36. Canada has most of the prerequisites for a substantial nuclear weapons program. Since 1942 the country has spent about \$500 million on its domestic nuclear research and power program, and an additional \$1.5 billion on mining and concentrating uranium for sale to the US and UK. Canadian nuclear research is quite advanced, and Canada has a number of reactors in operation. A weapons program would require construction of a plutonium separation plant, but this could be done more rapidly than in most other countries because Canada already has a pilot separation plant and has considerable experience in the field. A first device could probably be detonated in one to two years after a decision to do so. However, all Canadian governments since World War II have firmly opposed development of nuclear weapons. The present government is no exception, and public opinion strongly backs its position that Canada does not need and should not have a weapons program. In our view, no change is likely in this attitude for the foreseeable future.

H. Other Countries

37. There are several countries in addition to those already discussed which might reach a stage where they could initiate a weapons program in the next decade, but we believe none of them will do so. Among the East European nations, Czechoslovakia, East Germany, Rumania, and Yugoslavia are building or are considering the construction of nuclear power reactors which could be used to produce plutonium. Elsewhere, Australia and South Africa have well-developed uranium production facilities, but no plans for construction of reactors which could produce significant amounts of plutonium. We do not believe recent rumors that France has offered to assist South Africa in developing an atom bomb. Argentina, Brazil, Portugal, and Spain all have modest nuclear research programs. Switzerland plans to construct a large power reactor and has considerable scientific and technical know-how in the nuclear field, but lacks domestic uranium resources.

38. The Netherlands, like West Germany, has apparently made substantial progress in developing the ultracentrifuge process to produce highly enriched U-235, which could be used for a weapons program. The Dutch have managed to keep the details of their progress secret. However, we believe that the Netherlands will not in the next decade produce nuclear weapons even if their ultracentrifuge project is fully successful.

39. Finally, nations with wholly insufficient capabilities to develop nuclear weapons might be able to recruit nuclear technicians and experts from abroad, and somehow purchase everything necessary for a weapons program. It is also possible that one of the present nuclear powers might assist a less-developed nation to develop nuclear weapons, or actually provide such weapons outright. The UAR, for example, would almost certainly want such weapons if Israel had them, but the UAR could not get them unless it received either the weapons themselves or large-scale aid and almost all the technical know-how from some

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other country. A similar problem could arise with Pakistan, in response to India's acquisition of a nuclear capability. We think it unlikely that either the UAR or Pakistan would get sufficient help to enable them to produce nuclear weapons, or would have such weapons transferred to them. We do not now foresee developments which would lead to this type of situation elsewhere in the world in the next decade.

III. POLICIES OF THE PRESENT NUCLEAR POWERS TOWARD PROLIFERATION

40. As the above survey shows, we believe that in the foreseeable future only three nations—India, Israel, and Sweden—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, however, India, Israel, Sweden or 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 India, Israel, Sweden 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. The new Labor Government in England will probably be even more active than the Conservatives in opposing proliferation, but the ability of Britain to add much weight to efforts to deter India, Israel, or Sweden would be limited.

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. France has helped Israel develop its nuclear program to the point where Israel could go forward independently with a weapons program. De Gaulle has manifested no objection to the development of a Chinese Communist capability. However, the French have stated privately that they do not intend to disseminate nuclear weapons,

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and we believe this accurately describes their present policy, even though they apparently believe that proliferation is inevitable. Whether they deplore this or are indifferent to it—and their attitude here may vary with time and with the countries involved—they will probably not participate in efforts to prevent it.

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~~.

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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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