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# Communist China's Strategic Weapons Program

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Submitted by

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3 August 1967

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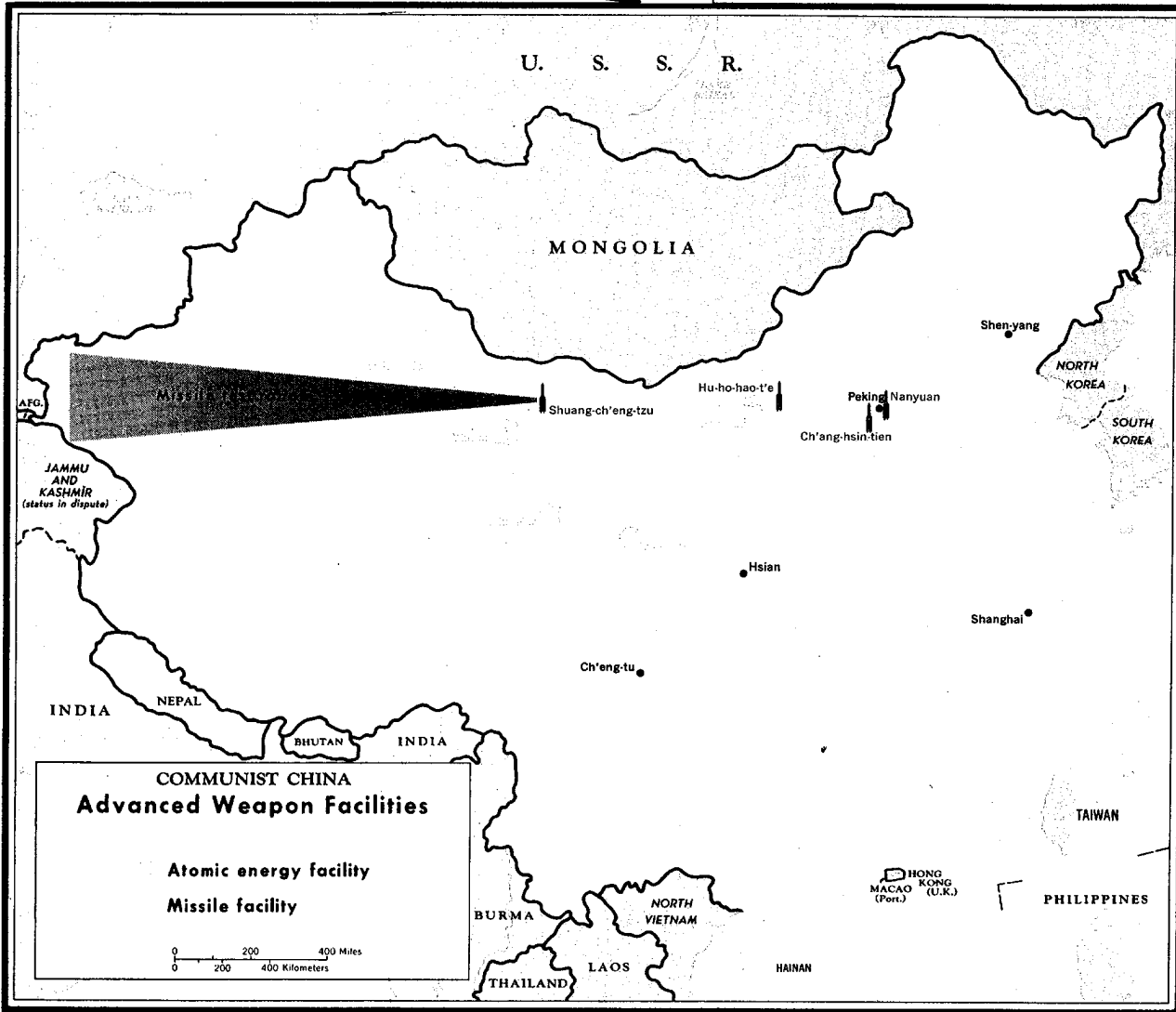
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## COMMUNIST CHINA'S STRATEGIC WEAPONS PROGRAM

### THE PROBLEM

To assess China's strategic weapons policy and programs and to estimate the nature, size, and progress of these programs through the early 1970's.

### CONCLUSIONS

A. It is clear that China aspires to great power status and that its present leaders have given high priority to developing a substantial strategic capability as essential to such status. With wise management of their limited resources, the Chinese could continue to make steady progress toward the achievement of these goals over the next decade.

B. The probable extent of actual progress will remain in doubt, however, so long as fanaticism and disorder continue to infect China. Some adverse effects on the advanced weapons program are probable in any event; serious disruptions could result from pressures to do too much too soon or from a general breakdown in central authority.

C. China probably now has a few fission weapons in stockpile deliverable by bomber, and has demonstrated the capability to produce thermonuclear weapons with megaton (mt) yields. It will soon have the plutonium available to aid in reducing such weapons to missile warhead size as well as to facilitate the development of more compact, light weight fission devices. For the next year or two, the limited availability of fissionable material will place significant restraints on warhead production, but this will ease significantly in the following years as the Yumen plutonium production reactor reaches full output.

D. We believe that limited deployment of an MRBM with fission warheads is likely to begin in the next six months or so. After 1968

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when increasing numbers of warheads could be made available, deployment will probably proceed at a higher rate. This deployment would be designed to threaten US bases, and major cities from Japan through the Philippines, southeast Asia, and northern India.

E. We estimate that the Chinese can have an ICBM system ready for deployment in the early 1970's. Conceivably, it could be ready as early as 1970-1971. But this would be a tight schedule, and should the Chinese encounter major problems, the IOC would be later. In any event, we will almost certainly detect extended range firings once they begin, and monitoring of these tests will probably provide about one year's advance warning of IOC.

F. We have no basis at this time for estimating how far or how fast the Chinese will carry deployment of their first-generation ICBM. Assuming political and economic stability, China will probably have the resources to support a moderate and growing ICBM deployment through 1975. Beyond that time frame, there is the possibility of significant improvements to this first system or the development of a follow-on solid fuel missile system based on the large complex now under construction at Hu-ho-hao-té in Inner Mongolia. If China makes good progress in the development of solid fuels for ICBM ranges, it might limit deployment of the first-generation system.

G. Other strategic delivery means have received less priority but China may begin production of some TU-16 medium bombers this year in the now-completed plant at Sian.

H. China will probably not push ahead vigorously with the now semidormant diesel-powered missile-firing submarine program. The one G-class submarine launched in 1964 does not yet have a missile. It would probably be at least 1970 before additional missile launching submarines could be available. China has shown some interest in nuclear propulsion technology, but even if design on a nuclear submarine is already underway, the first unit probably could not be operational until the late 1970's.

I. For political effect, China will probably attempt to launch an earth-satellite as soon as possible. This might be accomplished this year using an MRBM with an added stage or a heavier payload might be orbited using an early test vehicle from the ICBM program.

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## DISCUSSION

1. *General Considerations.* We now see more clearly the broad outlines of the Chinese strategic weapons program. It includes high priority work on an MRBM, on an ICBM, and on the production of fissionable materials and the development of both fission and thermonuclear weapons. Work in all these fields showed significant progress in the last year and these efforts clearly attest to Chinese determination. But many questions remain which bear critically on our judgments concerning the future pace and scope of the program, particularly with respect to production and deployment over the next five years. As yet there has been no obvious interference by the Cultural Revolution in the advanced weapons program, but we doubt that it has been completely immune.

2. We have little evidence on Chinese thinking with respect to the role of advanced weapons in their overall strategy. The present leaders probably believe that the successful development of strategic weapons would greatly enhance their prestige and strengthen their claims to leadership in Asia and their status as a great power. They would also hope that the possession of a strategic capability would give them greater security in supporting revolutionary struggles, particularly in Asia, and that it would serve to lessen the dangers of nuclear strikes on China itself for any reason. In other words, the Chinese may believe that the ability to strike the US and targets in Asia with nuclear weapons would serve to limit US military operations in Asia, and to keep any direct confrontation at the level of conventional arms where the Chinese would expect to enjoy many advantages.

### I. NUCLEAR PROGRAM

3. *Thermonuclear Devices.* Peking has conducted six tests, three of which were related to thermonuclear development. [REDACTED]

4. [REDACTED] the Chinese on 17 June 1967 detonated a thermonuclear device [REDACTED] This device was airdropped, probably by a TU-16. Both of China's TU-16 jet medium bombers were at the airfield serving the Lop Nor test area for several weeks before the test, and one was observed [REDACTED] over a weapon loading pit at this airfield. The airdrop marker used [REDACTED]

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[REDACTED]

for CHIC-3 was refurbished for CHIC-6/ [REDACTED]  
[REDACTED]  
[REDACTED]

6. *Fission Devices.* Peking announced on 27 October 1966 that it had on that day exploded a nuclear device which had been delivered by a guided missile.

[REDACTED]

There is no conclusive evidence as to the distance the missile might have flown, but we believe it probably was fired from the Shuang-ch'eng-tzu Missile Test Range (SCTMTR). Just prior to the test, a new launch complex was constructed at SCTMTR at a location well away from other facilities, suggesting a special concern for safety. This may have been the site from which the missile was fired. If so, this would mean that the missile flew a distance of about 450 nautical miles (n.m.) to the point of detonation in the Lop Nor nuclear test area. We do not know what type of missile was used, but the MRBM which has been under development for some years is the logical candidate.

#### **Nuclear Materials Production**

7. U-235. [REDACTED]  
our belief that U-235, the fissionable material used in all Chinese tests to date, is produced at the Lanchou uranium isotope separation plant. But we are now less confident of our estimate that the Chinese are using the electromagnetic process to "top off" the U-235 product that has been partially enriched in the gaseous diffusion cascade at Lanchou. Further analysis indicates that the Chinese could be using any one of three methods: the gaseous diffusion process only, gaseous diffusion process "topped off" with gas centrifuges, or "topping off" with electromagnetic separators.

[REDACTED]

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[REDACTED] [REDACTED]



[REDACTED] If the production is done entirely by the gaseous diffusion process (and this would require the use of small, tightly packed stages operated in a manner to maximize enrichment at the expense of some production capacity) it is likely that the level of output is between this minimum quantity and an amount two or three times greater. If electromagnetic "topping off" is the technique used, production rates close to the lower end of the range would be probable, considering the amount of building space available at Lanchou. Higher production rates would require that the final enrichment be done elsewhere in a sizable installation. A careful search has revealed no such an installation, and we think it unlikely that it could have escaped our notice. [REDACTED]  
[REDACTED]

9. *Plutonium.* A large plutonium production reactor at the Yumen nuclear complex began operation in early 1967. [REDACTED]

[REDACTED] We had previously estimated that the Chinese would operate the reactor well below capacity for a year or two in order to gain operating experience and to minimize the chances of equipment breakdowns. [REDACTED]  
[REDACTED]

To extract this plutonium the Chinese are proceeding rapidly with construction of a chemical separation plant at Yumen. The plant should become operational during the first half of 1968. The Chinese may have pilot plant facilities that could provide some plutonium for testing before the large chemical separation plant at Yumen comes into operation.

10. *Other Nuclear Materials.* A likely candidate for the source of heavy water—from which deuterium, one of the materials used in thermonuclear weapons, is obtained—has been identified. Apparently the Chinese have followed the common practice of locating heavy water facilities at nitrogen fertilizer plants. There is an installation resembling a Soviet heavy water facility at a fertilizer plant in Kirin Province in Manchuria. [REDACTED]  
[REDACTED]

#### Current Nuclear Weapons Production

11. In general, the Chinese seem to be giving priority to thermonuclear weapon development. Certainly thermonuclear testing has been the greater drain on

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nuclear material, and the success of the program strongly implies that China's best nuclear scientists have been concentrating on this program.

[REDACTED]

[REDACTED] The Chinese leaders almost certainly would want to have at least a few nuclear weapons on hand as soon as possible. [REDACTED]

[REDACTED]

Thus we believe the number of weapons in stockpile is likely to be small.

13. We have identified a facility that could be China's first nuclear stockpile site. It is located about 13 miles east of the nuclear weapons development and production complex near Koko Nor and appears to be nearly complete. We have recently identified construction at a site about 10 miles north of Wushiht'ala airfield, which supports the Lop Nor test area. Its similarity to the Koko Nor facility during its early stages of construction suggests that it too may be intended for nuclear weapon storage.

## II. CURRENT STATUS OF DELIVERY SYSTEM PROGRAMS

### *The MRBM Program*

14. [REDACTED] the accelerated pace of missile launchings at SCTMTR, first noted in 1965, extended through 1966 and is continuing in 1967. The evidence, [REDACTED] is fairly conclusive that most of the testing has been related to the development of an MRBM. [REDACTED]

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[REDACTED]  
15. [REDACTED]  
[REDACTED]

[REDACTED] Similarly, we cannot ascertain a number of important details concerning the missile's performance characteristics. Judging from what we see at the range, the Chinese MRBM is about 70 feet long, is serviced by road-transportable equipment, probably has radio-inertial guidance, and probably uses storable propellants. We continue to estimate that the Chinese have been working on a 1,000-mile missile but at present our evidence only permits us to say that some of the firings detected apparently flew somewhere between 600 and 1,000 n.m.

16. Though the system is road-transportable, we think it will require fixed sites probably involving some permanent support facilities. Considering the generally poor road network in China, the Chinese would probably want to locate their sites near rail lines. There is no sign of any work involving silos at SCTMTR. Hence, deployment, at least initially, will almost certainly be at soft sites.

17. Though the Ch'ang-hsin-tien Missile Development Center (CHTMDC) near Peking is primarily a research and development (R&D) facility, it probably is capable of producing missiles in quantities sufficient for a limited deployment program. A plant located nearby at Nanyuan appears suitable for producing airframes and possibly other missile components as well. These two facilities are the best candidates for the production of China's MRBM. [REDACTED]

[REDACTED] there is no evidence that the Chinese have begun series production at these facilities. Judging from our experience with Soviet missile production, it is unlikely that we will learn the quantities of missiles being produced at any particular plant.

18. The apparent frequency of missile firings at SCTMTR during May and June is greater than would be expected in the R&D phases of a missile's development. Although other explanations are possible, the evidence seems to indicate that the Chinese are conducting at least some troop training firings. If this is the case, preparation of field sites should already have begun. We have searched 1967 photography of somewhat more than half of China's rail network and have detected no such site preparation. Since we do not yet know what the deployed sites will look like, [REDACTED]

[REDACTED] we cannot be confident that we would spot the first deployment sites early in their preparation. (See centerfold map.)



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### *The ICBM Program*

19. There is good evidence that the Chinese are working on an ICBM system. A large new launch facility (Launch Complex B at SCTMTR) capable of accommodating a missile in the ICBM or space booster category, appears ready. Looking back over developments at CHTMDC we now believe that the Chinese have been working on the development of an ICBM since at least the early 1960's.

20. At this stage in the program, we cannot say much about the system's characteristics. Though a completely new design cannot be ruled out, it is more likely that the ICBM and MRBM programs have been closely related. For example, the clustering of MRBM-size engines would eliminate the need for the development of an entirely new propulsion system, and would be a logical approach for the Chinese to use. The missile will probably be a two-stage vehicle in excess of 100 feet in length and about 10 feet in diameter. In order to reach the principal targets in the US, the Chinese would need a missile system with a range of 6,000 n.m. Chinese test facilities appear adequate to handle engine thrusts large enough to give this range.

21. A storable propellant system has important advantages for a deployed missile system. Though the evidence is not conclusive one way or the other, we believe the Chinese probably intend to use such a propellant in their ICBM. It is unlikely that the Chinese have mastered the complex technology of all-inertial guidance, and their first ICBM system will probably have radio-inertial guidance.

22. Launch Complex B is apparently ready to support flight testing. The first tests will probably be firings of the first stage to distances of a few hundred miles, within the borders of China. The orientation of Complex B and the location of what appears to be a downrange electronic station suggest that eventually there will be firings in a southwesterly direction. ICBMs fired to full range in this direction would impact in the Indian Ocean. The Chinese would presumably desire to provide instrumentation and communication facilities within range of the impact area. This requirement could be met by land-based facilities, but for both technical and political reasons we believe the Chinese are more likely to rely on specially equipped ships. As yet, however, we have no evidence of preparations to provide such facilities.

### *Other Delivery Systems*

23. *Bomber Program.* There is good evidence that in the late 1950's the Soviets were helping the Chinese build a plant at Sian for the production of the

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TU-16 (Badger) jet medium bomber. Work on this plant, which was interrupted in the early 1960's, was resumed in late 1963 or early 1964 and it now appears complete. If the Chinese still intend to produce TU-16s, the plant could turn out its first aircraft late this year or in early 1968.

### **Missile Submarine Program**

24. The Chinese apparently retain an interest in a submarine launched missile system, but there is some evidence to suggest that the program has been delayed for some reason or other. China's only G-class submarine was launched late in 1964 and began putting to sea occasionally about a year later. No new submarines of this class have been identified under construction, however, and the existing one has never been detected in anything but routine underway training. Furthermore, at about the time the Chinese were building their G-class they were also working on a special wharf facility which we believe is for missile handling, but this facility has remained in a state of semicompletion.

25. We have no direct evidence for judging what kind of submarine launched missile the Chinese may envisage or when they may have one available. We have not detected any testing of such a missile but it is possible that some of the missile engine static testing at Ch'ang-hsin-tien and flight testing at Shuang-ch'eng-tzu could be connected with a submarine missile system. While land-based tests could remain unidentified, it is less likely that a sea-based test program would long avoid detection. At least a year of sea-based launchings would probably be required to test out fully a submarine launched ballistic missile (SLBM) system.

26. *Space Program.* The acting Chief of Staff of the Peoples Liberation Army has been quoted in Red Guard newspapers as claiming that the Chinese will conduct a space launch in 1967. Primarily for political reasons, the Chinese will probably try to put something into space as soon as possible, and it could occur this year. One possibility is the launching of a small satellite using an MRBM with an added stage. Another is the launching of a heavier payload with an early test vehicle from the ICBM program.

### **III. PROSPECTS**

27. Chinese determination needs to be taken into account when considering the likely future scope and pace of their strategic weapons program. But determination alone will not solve the many practical problems facing the Chinese. In planning, design, and testing, the Chinese no doubt have benefited from the foundations laid during the period of Soviet assistance. But in the production of MRBMs as well as in the testing of ICBMs and the fabrication of suitable



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warheads, the Chinese are dependent primarily on their own technology and on whatever they can gain from non-Communist sources. They will continue to profit significantly from their access to Japanese and West European technology and from their ability to purchase industrial plant, sophisticated instruments, and scarce materials from these sources. But this can only partially offset the deficiencies of China's relatively limited technological and industrial base. We think it likely that they will encounter difficulties in moving from R&D to the industrial production of the components of complex weapons systems. And when the Chinese solve their production problems, they will still face an intense competition for scarce resources.

28. Chinese military planners must recognize that in the foreseeable future China cannot begin to match the nuclear striking power of the US. They probably also realize that the credibility as a deterrent of their first-generation systems will suffer because these systems would have a poor chance of surviving an offensive strike and would be vulnerable to some degree to defensive systems the US is capable of deploying. In order to concentrate on developing improved and refined systems that would have a more impressive credibility as a threat and as a deterrent, Peking might opt for only a token deployment of its earliest weapons. Against this, however, Peking would probably weigh the judgment that more than token deployment of its first ICBM would be worthwhile because it would enhance its leverage on Asian countries, would have increased deterrent effect on the US, and would generally pay important political and psychological dividends.

29. The Chinese must also strike some balance in the allocation of resources as between intercontinental and regional strategic forces and between weapons systems within the regional force. Rather than concentrating all resources on, say, an ICBM program, the Chinese probably believe that they could more quickly enhance their overall military posture by allocating some of their limited means to a force which could hold much of Asia hostage. Within the regional force concept, the idea of producing more than a few TU-16 bombers as weapons carriers might lose some of its attraction for the Chinese, if they were able to develop a reliable and mobile MRBM or an IRBM capable of delivering thermo-nuclear weapons.

30. To further complicate the situation, there remains the question of political and economic order in China. Thus far, the political upheaval in China does not seem to have affected the strategic weapons program; the regime has exercised particular care to insulate the nuclear and missile program from it. But gradually small bits of evidence have accumulated which suggest that some longer term harm may have been done to the administration and organization of the programs.

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31. For example, according to Red Guard posters, revolutionary strife has occurred in the governmental ministries responsible for nuclear and missile development. The head of the National Defense Scientific and Technology Commission, Nieh Jung-chen, has come under sporadic attack. Another possible sign of political interference is the distinct "Leap Forward" flavor of Peking's propaganda treatment of the recent sixth nuclear test. Unnamed advocates of solving scientific problems step by step have been criticized while "revolutionary" scientists and technicians who were not afraid to take bold shortcuts have been extolled. Though this is no doubt partly propaganda [REDACTED]

[REDACTED] it could mark the intrusion of political pressures into the advanced weapons program. Thus, despite the privileged status of these programs, it will be increasingly difficult for Peking to shield them from unrealistic demands for spectacular progress, from the unhealthy political atmosphere in China, and from the general erosion of economic efficiency and managerial control.

32. It is difficult to judge how much our basic calculations of the time required to develop, produce, and deploy various kinds of military hardware should be adjusted to take account of these weaknesses. It may be that we have considerably underestimated the Chinese, and it is possible that they will be able to bring most of their programs to fruition on a rapid schedule and to produce and deploy various weapon systems in substantial quantities. But the odds are better that the Chinese will have to make compromises, perhaps stretching out some programs and settling, at least initially, for limited deployments.

#### IV. PROJECTIONS

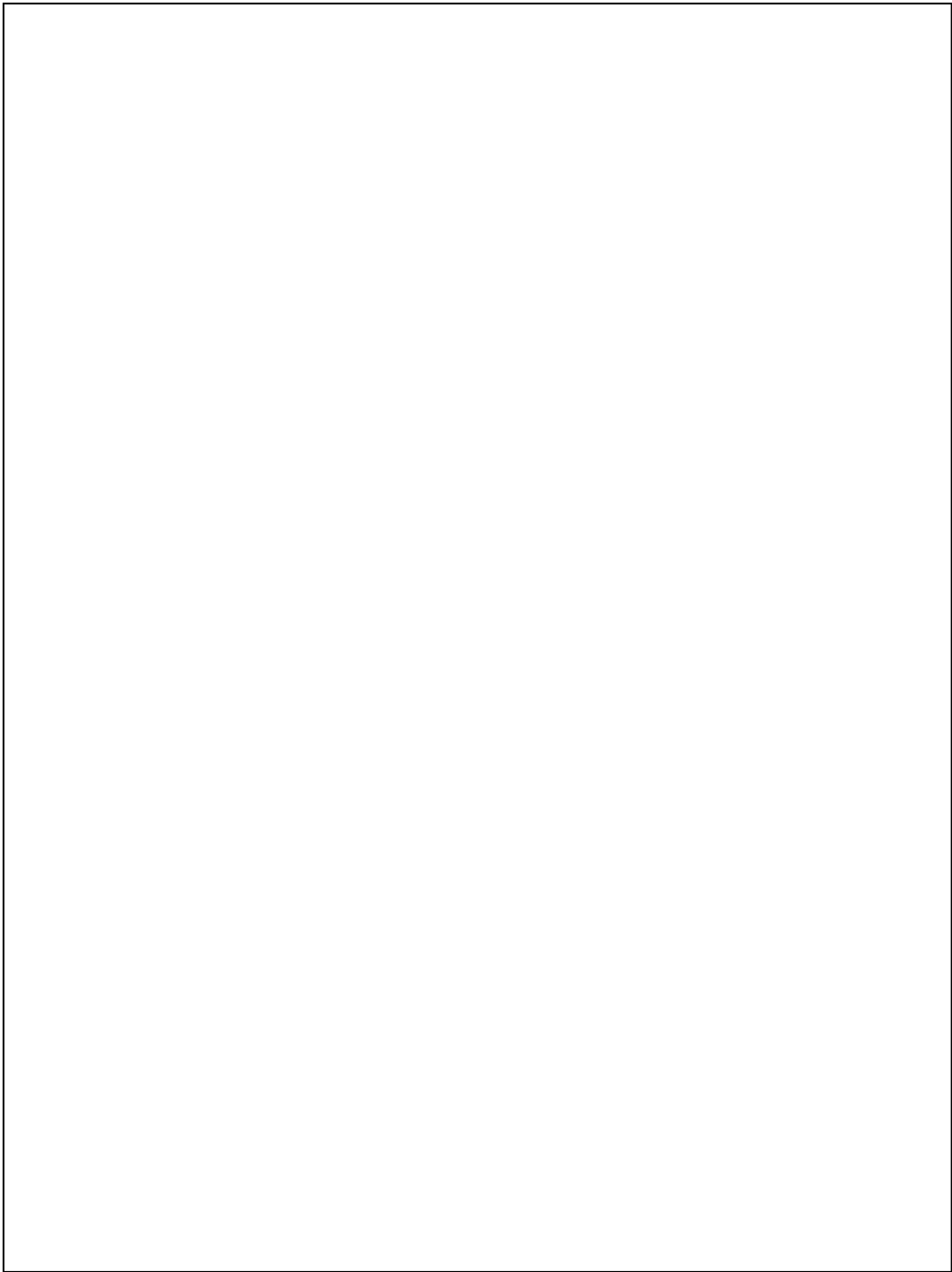
33. It is clear that China aspires to great power status and that its present leaders believe that a substantial strategic capability is essential to such status. Barring serious political and economic upsets in China, we believe the Chinese have the resources to make steady and impressive progress toward the achievement of such a capability. At the same time, we would stress that the Chinese program will be limited in scope, and in qualitative and quantitative achievements over the next decade by the industrial, technological, and skilled manpower weaknesses of China. If China should attempt too much too soon, the long-run consequences could be highly disruptive both for an orderly advanced weapons program and for the economy in general.

##### *The Nuclear Program*

34. Through 1970, at least, Chinese fissionable materials will be limited to the output from the Yumen reactor and the U-235 production plant at Lanchou. These amounts are not inconsiderable, however, and once plutonium devices have

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been tested, it is apparent [REDACTED] that China will be able to build a substantial weapons stockpile by 1970.

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[REDACTED]

35. If the Chinese envisage a substantial ICBM deployment program with TN warheads, and if they have already made good progress in solving the considerable technical problems involved, we would expect to see efforts to expand U-235 capacity some time in the next year or two. Once construction started on a new U-235 plant, it would take about three years for production of U-235 to begin.

#### **Delivery Systems**

36. *MRBM Deployment.* As suggested above we believe that the Chinese MRBM should be ready for deployment in 1967 or 1968. Evidence respecting troop training is not conclusive, however, and evidence on other preparations for deployment is lacking. This leaves open the possibility that little or no deployment of the MRBM is planned. It could be that the principal purpose of the MRBM program was to develop technology for an ICBM.

37. We think it more likely, however, that significant deployment is intended and that it will begin within the next six months or so. For the next year or two, however, the availability of nuclear warheads is likely to limit MRBM deployment.

38. MRBM deployment will probably be designed to give coverage to targets in the arc stretching from Japan through the Philippines, southeast Asia, and northern India. The Chinese objective might be to provide coverage of important military bases and population centers within this area, hoping in this way to hold Asian countries hostage against any US threats to China. They might consider that this could be accomplished by the deployment of some 80-100 MRBM launchers in fixed, soft sites. [redacted]

[redacted] Barring economic or political disruptions we believe that China will proceed with MRBM deployment somewhat as above, although it may be the mid-1970's before deployment on this

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scale is achieved. For both military and political reasons we do not anticipate any early deployment of MRBMs directed at the USSR, although some of those MRBMs located in Manchuria would have the capability of hitting targets in the Soviet Union.

39. *IRBM.* If, as we believe, the Chinese are working on a 1,000-mile MRBM and an ICBM, there would be only a marginal requirement for an IRBM. Moreover, we see no evidence of any such program and consider any early Chinese efforts to develop an IRBM unlikely.

40. *ICBM Deployment.* We estimate that the Chinese can have an ICBM system ready for deployment in the early 1970's. Conceivably, it could be ready as early as 1970-1971. But this would be a tight schedule and makes allowance for only minor difficulties and delays. We have no evidence that flight testing of the ICBM has even begun. Should the Chinese encounter major problems, the IOC of an ICBM would be later. In any event, we will almost certainly detect extended range firings once they begin, and monitoring of these tests will probably provide about one year's advance warning of IOC. With further nuclear tests, the Chinese should have by 1970 a one to three mt thermonuclear warhead suitable for their ICBM.

41. We have no basis at this time for estimating how far the Chinese will carry deployment of their first-generation ICBM. In view of the requirements of other military programs and the pressure on resources, however, we believe deployment will proceed at a moderate pace and well below any possible maximums. By moderate we mean that in 1975 the number of operational ICBM launchers might fall somewhere between 10 and 25.

42. Additional information bearing on the probable scope of both the MRBM and ICBM programs should be available over the next year. In the meantime, we have some clues suggesting that the Chinese are already at work on follow-on systems. The best evidence of this is a large installation the Chinese are building at Hu-ho-hao-té in Inner Mongolia which we believe is for testing and manufacturing composite solid fuel rocket motors. This complex is still under construction and it will probably be at least three years before motors developed here could be ready for flight testing. Thus, it is too early to tell what kind of missile the Chinese are working on. But the fairly large size of the static test facilities at this installation suggests that some kind of long-range system is envisaged.

43. *Medium Bombers.* We believe the Chinese intend to produce the TU-16 bomber at Sian. Such a medium bomber with a combat radius of 1,650 n.m. would give more range than an MRBM and would provide an interim carrier for thermonuclear weapons. It would also add flexibility to China's military capabilities. Finally, the Chinese may consider it useful to follow through on the original plan (which dates from the late 1950's) for TU-16 production in order to gain experience useful in the future development of larger aircraft. Few if

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any TU-16s could be available before early 1969, but by 1972 there could be 75 or so assigned to operational units. By that time, it is possible a follow-on bomber could be in the early stages of R&D and would eventually replace the TU-16 force.

44. If the Chinese plan to use their TU-16 aircraft against naval and other clearly defined radar targets, they would probably produce some of them in an air-to-surface missile (ASM) configuration. The Chinese probably have the capability to develop an ASM, with a 75 to 100 n.m. range, and given time, a compatible nuclear warhead. But in view of the pressures of other programs, we would not expect to see an operational ASM system before 1972-1973.

45. *Missile Launching Submarines.* We believe that development of an SLBM system will continue to suffer from a lack of priority for several more years. [REDACTED]

[REDACTED] there is no evidence that the Chinese are building G-class submarines. Thus, it would probably be at least 1970 before additional missile launching submarines could be available. The Chinese have shown some interest in nuclear-powered submarine technology, but, even if they have already started working on designing such a submarine, the first unit probably could not be operational until the late 1970's.

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