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EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY
WASHINGTON, D.C. 20506

April 5, 1972

MEMORANDUM FOR

Dr. Henry A. Kissinger

SUBJECT: U. S. Policy on a Comprehensive Test Ban (CTB)

Enclosed for your review is a paper outlining my general position towards U. S. policy on a comprehensive test ban. I have arrived at this view largely as a result of a closely held but thorough technical study of the topic by an ad hoc OST panel of experts, but also from close interaction with the NSSM 128 review and others throughout the government. The panel's study has been provided to your staff for their use, and views expressed in the paper have also been discussed at some length between our staffs. Briefly, the essence of my position is:

- Make no further moves toward CTB. I conclude that the benefits do not outweigh the penalties at this time, and that plausible SALT or tactical nuclear review outcomes will not alter this conclusion.

- Consider replacing the OSI requirement with unattended seismic observatories as an alternative means of ensuring adequate verification.

- Require PRC and French participation in a CTB.

- Proceed towards upgrading our seismic verification capability and spaceborne verification capability by developing and deploying prototypes of the important elements.

- If a decision to proceed towards a CTB is made, take specific steps to ensure that research on pure fusion technology can continue under the CTB.

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While my position remains open to some modification following the Verification Panel review of the subject, I believe it is sound and appropriate. I will be prepared to discuss my views at the Verification Panel review and will be happy to discuss them in more detail with you and your staff if that would be helpful.

Edward E. David Jr.
Edward E. David, Jr.

Enclosure - S&T TS No. 1279, Cy 1-A

U. S. POLICY ON A COMPREHENSIVE TEST BAN

Current or potential performance of the U. S. verification system is not really a key issue in a review of policy towards CTB negotiations. It is agreed that for about $20M we could establish in a few years a capability to identify all but about five events per year above $M_b = 4.0$ with 90 percent confidence. More importantly, it is generally agreed that under the current or future U. S. verification system, the Soviets could, with some small risk of discovery, clandestinely conduct numerous tests below 2 or 3 kt, and with increasing risk, a few tests from 10-50 kt per year by decoupling, and perhaps a test every year or so in the 50-100 kt range by masking in or simulating earthquakes. Properly conducted, these techniques would not be detectable by other national means either. Decoupling and masking appear feasible even though they have not been demonstrated at high yields. The central issue is whether this amount of clandestine testing, coupled with the impact of our being unable to test, poses risks or penalties sufficiently significant to outweigh the perceived benefits of agreeing to a CTB. The need for on-site inspection (OSI) is tangentially relevant, but only because it has been a publicly stated position and the focal point of past US/USSR disagreements. While OSI would increase the costs and risks of clandestine testing somewhat, its effectiveness could clearly be negated by a determined evader. Peaceful nuclear explosions (PNE) are also a side issue because special verification arrangements would be required to permit them under a CTB, and because the USSR may wish to continue its PNE program strongly enough to insist on such accommodations.

Regarding the significance of USSR evasion, coupled with complete preclusion of U. S. testing under a CTB, it is unlikely that a CTB would result in catastrophic deterioration of our strategic deterrent. The consequences of a CTB would be felt most severely in the event of a major Soviet ABM expansion or an ASW breakthrough. In either event, however, there are non-nuclear response options we could exercise which, although more expensive (and perhaps very much so), would be adequate. Moreover, we would probably notice the Soviet trend prior to major deployment, leaving some time for response, and if the threat were grave enough to require it, we could withdraw from the CTB treaty (although time would be required to justify withdrawal and to reestablish our design and test capability).

Clear penalties which would accompany a CTB that we respected and the Soviets chose to evade, consist of the following:

a. Our nuclear design capability would slowly but surely deteriorate while, via a minimum of clandestine testing, the USSR could maintain hers. This would reduce our ability to remain abreast of the technology, to maintain nuclear options for response to changing threats (such as ABM expansions or Soviet or PRC tactical nuclear expansions), and to guard against technological surprises. It is particularly important, for example, that we be able to determine experimentally the feasibility and probable impacts of pure fusion technology so as to better perceive future threats. This technology also has important implications for weapon effects simulation and advanced U. S weapons, as well as for future clean energy sources.

b. We would not be able to conduct a nuclear test to evaluate or prove a fix for any fault found in our strategic stockpile, while the USSR could. Non-nuclear fixes might be possible, but we might also be faced with the need to rebuild large segments of the stockpile, which would be expensive and, more seriously, time consuming.

c. We would not be able to modernize our low yield tactical stockpile, should that be desired, while the Soviets (and the PRC) could. The relevance of maintaining this option is uncertain, since the Soviets may not wish to modernize, but it is related to potential developments in European and Asian nuclear forces, each of which are under study.

d. We would be unable to develop and deploy new nuclear warheads for new weapon systems. This would require that any necessary improvement or expansion of our nuclear forces be accomplished by improving only the non-nuclear portions of our systems, using existing warhead designs. This can be done, but frequently at greater expense (e.g., an additional submarine or improved guidance instead of smaller warheads for a specific damage level). The USSR would be similarly restricted in the case of high yield warheads because of the high risks of detection associated with the numerous tests needed for weapon development, so this penalty is, in fact, one of the anticipated benefits of a CTB, e.g., slowing the arms race. Because of the Soviet's larger boosters, etc., however, the added cost of non-nuclear improvements may not be as great for them. Also, current intelligence provides no reliable indication of the actual status of their nuclear developments, so the net slowing of the arms race we could count on seems small.

Against these penalties must be weighed the perceived benefits of a CTB. Environmental concerns are just not the issue that they were when the LTBT was under consideration -- no serious harmful effects have been experienced from the underground test program nor are any likely to be. As discussed above, there would be little significant technical contribution to slowing the arms race because deployment of additional or non-nuclearly improved forces is as great an element in maintaining the race, perhaps greater, than advances in nuclear technology, and a CTB would not restrain deployment or non-nuclear improvements. We would realize the political advantage of reaching a publicly stated objective, but a major increase in progress towards NPT objectives would be unlikely without PRC and French participation. At this time it is my judgment that the penalties to the U. S. are not justified by the benefits. I doubt that plausible SALT or Tactical Nuclear Weapons review outcomes would reverse this judgment, since neither is likely to produce a compelling basis for foreclosure of nuclear options for the long-term future.

The contribution of OSI to our verification capability is so minimal, except perhaps as a negotiating position, that it could be abandoned. If we want to negotiate a CTB at this time, we could negotiate away the OSI requirement for some other quid pro quo. If we do not wish to move towards a CTB at this time, we should (a) say so on the basis of a reassessment of penalties, (b) insist on numerous unattended stations in the USSR as an alternative (and more credible) delaying tactic than OSI, or (c) require PRC and French inclusion. I would favor a combination of (b) and (c).

PNE technology can be an important contributor to future energy resources and should be maintained as a permissible option. Possible PNE accommodations should be addressed separately from CTB negotiations to determine whether an acceptable international monitoring procedure could be established.

I believe we should proceed immediately to upgrade seismic verification systems by developing and deploying prototypes of the important elements in any event, because it takes time to do so and it would be useful to have acquired some technical and operational experience with the improved systems should we decide to move towards a CTB later. To maintain our verification capability against tests in space, our spaceborne verification systems should be similarly upgraded.

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There is one additional matter of detail which may lead to adverse consequences through inadvertence. This is the definition of a "nuclear test" or "nuclear explosion." Those terms were not defined in the Limited Test Ban Treaty because it was written in an era when nuclear technology supported only substantial explosions. However, recent work in high explosive driven pure fusion devices as well as laser initiated devices permits "explosive" (i.e., short interval) release of small amounts of nuclear energy, even within laboratories. This work is related to the understanding of controlled fusion as an energy source as well as to weapon technology. Under no circumstances should this work be truncated. In addition, it presents impossible verification problems.

To summarize:

- Make no further moves toward CTB. I conclude that benefits do not outweigh the penalties at this time, and that plausible SALT or Tactical Nuclear review outcomes will not alter this conclusion.

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- If a decision to proceed towards a CTB is made, take specific steps to ensure that research on pure fusion technology can continue under the CTB.

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