

WITHDRAWAL SHEET (PRESIDENTIAL LIBRARIES)

FORM OF DOCUMENT	CORRESPONDENTS OR TITLE	DATE	RESTRICTION
#1 memo	Bundy to Holders of NSAM 282 <i>dated 2-26-93 NLJ</i> S 1 p <i>[Dup. #8b, NSF, Ende File, Comm. on Nuclear Proliferation, Problem 4, Vol 2, Peaceful Uses - Gen. Box 3]</i>	51-7/20/64	A
#2 memo	Duplicate of #1		
#2a memo	Duplicate of #1		
#3a memo	Duplicate of #1		
#4a memo	Bundy to SecState and AEC Chairman <i>open 12-6-99</i> S 1 p [Duplicate of #6b, 10, 11a, 11b, 14]	2/11/64	A
#5a rpt	"AEC Comments on and Suggestions for..." S- 8 p	undated	A
#5b memo	U.A. Johnson to Bundy <i>open 7/02</i> S 6 p	5/7/64	A
#5e rpt	Attachment to #5b <i>ll "</i> PCI 1 p	undated	A
#5e memo	Research Memorandum INR-9 <i>open 4-17-09</i> <i>closed</i> S 5 p	2/25/64	A
#5i memo	"Test Ban Treaty Limitations..." <i>open 7/02</i> S 2 p	undated	A
#5m memo	"Interpretation of Test Ban Treaty..." <i>ll "</i> S 5 p	4/17/64	A
#6 memo	Johnson to Bundy C 2 p	7/15/64	A
#6a memo	Seaborg to Bundy <i>open per RAC 8/09 12/10/17</i> S 2 p	6/5/64	A
#6b memo	Duplicate of #4a, #10, 11a, 11b, 14- <i>open 12-6-99</i>		

FILE LOCATION

NSF, NSAM, NSAM 282--Project SULKY

Box 3

RESTRICTION CODES

- (A) Closed by Executive Order 12356 governing access to national security information.
- (B) Closed by statute or by the agency which originated the document.
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WITHDRAWAL SHEET (PRESIDENTIAL LIBRARIES)

FORM OF DOCUMENT	CORRESPONDENTS OR TITLE	DATE	RESTRICTION
#6f rpt	"Analysis of Project Sulky" S- 6 p	undated	A
#7a ltr	Seaborg to Bundy S- 2 p <i>open per RAC 8/09 12/18/17</i>	6/5/64	A
#9 memo	Orwick to Johnson <i>open 12-6-99</i> S- 1 p	4/10/64	A
#10 memo	Duplicate of #4a, 11a, 11b, 14 <i>open 12-6-99</i>		
#11a memo	Duplicate of #4a, 10, 11b, 14 <i>open 12-6-99</i>		
#11b memo	Duplicate of #4a, 10, 11a, 14 <i>open 12-6-99</i>		
#13 memo	Duplicate of #1		
#14 memo	Duplicate of #4a, 10, 11a, 11b <i>open 12-6-99</i>		

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THE WHITE HOUSE
WASHINGTON

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July 20, 1964

MEMORANDUM FOR HOLDERS OF NSAM NO. 282

SUBJECT: Project SULKY

1. The Review Committee on Underground Nuclear Tests, on behalf of the President, reviewed the memorandum dated May 7, 1964, "International Approval of Nuclear Explosions for Peaceful Applications," prepared by the Secretary of State in response to NSAM No. 282 and endorsed the three general courses of action proposed in that report.
2. In addition to the courses of action proposed by the Secretary of State, the Review Committee also concurred in the desirability of continuing the study of the proposal of the Atomic Energy Commission that some objective standard be used to establish a technically defined dividing line between when radioactive debris is "present" and when it is "not present" within the meaning of the Limited Test Ban Treaty.
3. The Review Committee noted and generally endorsed the desirability of taking action along the lines of the proposals contained in Section II of the comments contained in the AEC memorandum dated June 26, 1964.
4. The Review Committee noted that the general coordinating responsibility for the implementation of the above actions is the responsibility of the Secretary of State with the active operating support of the other responsible agencies, particularly the Atomic Energy Commission, Department of Defense and the Arms Control and Disarmament Agency.
5. The Review Committee also concurred in principle with the desirability of conducting Project SULKY sometime in December. It was agreed that the AEC would include Project SULKY in its regular authorization request for WHETSTONE II and that final approval would be given at that time after the Review Committee had an opportunity to consider the final analysis [REDACTED]

1.3(a)(5)

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E.O. 12356, Sec. 3.4
NLJ 91-95
By 128, NARA, Date 1-25-93

McGeorge Bundy
McGeorge Bundy

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THE WHITE HOUSE
WASHINGTON

7/20/64

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Mr. Bundy:

Spurgeon Keeny has
concurred in the attached
memorandum.

CEJohnson

T. M. Smith for info 9
2. File 4

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THE WHITE HOUSE
WASHINGTON

February 11, 1964

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NATIONAL SECURITY ACTION MEMORANDUM NO. 282

MEMORANDUM FOR: The Secretary of State
The Chairman, Atomic Energy Commission

SUBJECT: Project SULKY

In view of the delicacy of the balance of US-USSR relationship in other major areas plus the tight schedule for conducting SULKY at this time, the President has decided to defer further consideration of SULKY without prejudice until next winter in the expectation that the intervening time could be profitably used for a review of possibilities for improving nondetection and to give a longer period in which to select the most favorable wind and weather conditions.

In addition, the President requests the Secretary of State, in consultation with other responsible officers of the Government as appropriate, to give immediate consideration to the probabilities and problems involved in obtaining from the nations signatory to the Test Ban Treaty approval for the utilization of nuclear energy for peaceful explosions under adequate international controls. The President requests that a first report on this matter be available to him by the end of March.

McGeorge Bundy
McGeorge Bundy

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cc:
Mr. Bundy
C. Johnson
NSC Files

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Authority NSC Memo 8-31-95
By W NARA, Date 12-3-95



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UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D.C.

JUN 26 1964

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Dear Mac:

In accordance with the request in your memorandum of June 23, 1964, I am sending the enclosed copies of "AEC Comments on and Suggestions for Implementation of the Department of State Report on Nuclear Excavation" which constitutes the Atomic Energy Commission's comments on the Department of State report.

Sincerely,

Chairman

Enclosure:
Cy/B+2Bof
S-RD report

Honorable McGeorge Bundy
Special Assistant to the President
for National Security Affairs
The White House

When separated from enclosures, handle this document
as **UNCLASSIFIED**
(Insert proper classification)

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DEPUTY UNDER SECRETARY OF STATE
WASHINGTON

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May 7, 1964

**MEMORANDUM FOR MR. McGEORGE BUNDY
THE WHITE HOUSE**

**SUBJECT: International Approval of Nuclear Explosions
for Peaceful Applications**

National Security Action Memorandum No. 282 requested a first report by the end of March on "the probabilities and problems involved in obtaining from the nations signatory to the Test Ban Treaty approval for the utilization of nuclear energy for peaceful explosions under adequate international controls." This is a response to that request. The problem posed is one which necessarily must be reviewed periodically in the light both of the international situation and the state of our technical development.

There are two ways that international agreement to the conduct of Plowshare excavation projects might be obtained. One would be the amendment of the Test Ban Treaty to exclude peaceful uses applications of nuclear explosives from the restraints of the Treaty. The other method would be the approval of specific described projects through the voting procedures prescribed for amendment of the Treaty. Our view, at the present time, is that the second method would be the more likely of success.

There appears to be little likelihood, however, that the Soviets would be receptive at this time to any proposal to exempt Plowshare excavation experiments or applications from the Treaty restraints. We have very little evidence of active Soviet interest in the application of nuclear

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By [Signature] NARA, Date 6/10/02

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excavation techniques (See Tabs A and B), although the USSR leads the world in large-scale excavation with conventional explosives. Clearly, at the time of the Test Ban Treaty negotiations, Khrushchev did not envisage early amendment of the Treaty, and his statements about the use of nuclear detonations for peaceful purposes were set in a vague and indefinite future. Perhaps encouraging is Khrushchev's April 20 statement about allocating "...more fissionable materials for peaceful uses - in atomic power stations, in industry, agriculture, in medicine, in the implementation of major scientific, technical projects, including the distillation of sea water." We note, however, that nuclear excavation was not included specifically in the enumerated activities.

We understand that four or five years will be required to develop the devices and cratering technology which would be required in large-scale excavation projects, such as a new trans-Isthmian canal. During this period it would seem important to stimulate international interest and cooperation in the nuclear excavation program to the maximum extent possible. By international participation in Plowshare symposia, observation of cratering shots or experiments and perhaps exchange of test data, it should be possible to demonstrate the economic development potential of nuclear excavation, the absence of hazard to human life and the safeguards that could be provided to prevent evasion of the Treaty for weapons development purposes. Development of international acceptance or even of cooperative effort by Treaty signatories would obviously provide the most favorable atmosphere in which to seek and gain support for international agreement, under the voting procedures of the Treaty, for approval of specific excavation projects.

ACDA has suggested that the most likely opportunity for raising the question of a treaty amendment for the conduct of nuclear excavation projects probably will be in the context of future international discussion of a comprehensive test ban.

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In the context of such discussions it might be possible to obtain some easing of the restraints on the conduct of nuclear explosions for peaceful purposes. It is difficult to predict, however, when such discussions might be reopened and it is possible that discussions in this context might lead to more rather than less restrictive conditions on Plowshare. (See Tab C)

While development of the nuclear devices can proceed within the Treaty limits, there are some uncertainties as to the limitations placed on the development of the necessary cratering technology by the Treaty language. The committee established by NSAM 269 is charged with reviewing the facts relating to any prospective nuclear test "which might violate or be regarded as violating the Nuclear Test Ban Treaty." The discussions to date by that committee seem to indicate that the Treaty restraints may well inhibit the development of cratering technology and become a limiting factor earlier than the estimated first large-scale excavation project some four or five years hence. (In presenting the Treaty to the Senate, Administration witnesses, while acknowledging that large-scale applications such as a trans-Isthmian canal could not be carried out under the Treaty, clearly expressed the view that properly devised experiments for developing the excavation technology could be conducted, See Tab D. Similar testimony was given as recently as 4 March 1964 before the Senate Committee on Commerce.) Certain of the tests designed to develop the necessary cratering technology raise concerns of Treaty violations with some of the committee members. The concern is with the definition of "radioactive debris...present outside the territorial limits" of the United States. While it seems useful to identify the conflicting views on this problem (as is done below), it is not our purpose here to address ourselves to its solution, which is the proper concern of the NSAM 269 committee. The concerns expressed in that forum, however, underline the urgency of establishing an atmosphere of international acceptance of and cooperation on peaceful excavation activities.

The AEC believes that the review committee established by NSAM 269 can adopt policies of appraisal which would

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allow many of the required cratering experiments to be carried out. If so, the need for a Treaty amendment would be obviated for some years. Furthermore, if cratering experiments are carried out with international observation, an atmosphere can be created in which an amendment could be obtained more easily.

In AEC's opinion a particularly appropriate consideration in appraising cratering experiments, in view of the Treaty limitation on causing debris "to be present" beyond territorial boundaries, is the internationally accepted technical definition of when radionuclides are considered "not present". Such a definition is found in the health protections guides of both the USSR and the US (10 CFR 20) as well as in the guides of the International Commission on Radiation Protection and the International Atomic Energy Agency. In addition a precedent for the use of this definition in interpreting an international treaty is found in the operation of the McMurdo nuclear reactor and the very slight attendant release of radioactivity within the limits of 10 CFR 20. This procedure is considered by the US to be consistent with the prohibition in the Antarctica Treaty of 1961, to which the USSR is a party, against "disposal there of radioactive waste material". Soviet representatives have visited this facility.

AEC points out that the legal basis for such policies of appraisal is the principle of "de minimis" or the application of a "rule of reason" to interpret otherwise imprecise provisions of law. Since the Test Ban Treaty does not contain precise technical criteria, it becomes necessary for the NSAM 269 committee to decide when debris might be considered "present". Among other relevant material to be considered in deciding this question is the understanding of the Senate in advising and consenting to the Treaty. In this connection, the Foreign Relations Committee reported, after hearing all the testimony on this and other questions, its understanding that "the Plowshare program will not be seriously inhibited by the Treaty".

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It should also be noted that, since the technical definition of when radionuclides are "not present" is when their concentration is small compared to maximum permissible concentrations under health protection guides, the levels of radiation involved in this definition are internationally accepted as being far below the point where there might begin to be a health hazard. Thus, this definition would be consistent with a stated objective of the Treaty "to put an end to the contamination of man's environment by radioactive substances."

ACDA is concerned about the international repercussions if debris attributable to U.S. underground nuclear explosions should be picked up outside our territorial limits (Tab E). The Tass press release and related cable from Moscow commenting on the accidental venting of one of our recent Nevada tests (Tab F) show that the Soviets are fully alert to this possibility. In these circumstances, ACDA is concerned that the good faith of the United States in seeking arms control agreements could be thrown into doubt by possible charges of violation, and that our reputation as a country which takes its treaty obligations seriously could be prejudiced. As to the consideration suggested by the AEC for appraising what is acceptable under the Test Ban Treaty, ACDA believes that its application would result in a substantial risk of incurring the international consequences described above. The Treaty speaks simply of causing "radioactive debris" to be "present" outside territorial limits and there is nothing in the text itself to indicate that the presence of small amounts of debris should be excepted. Finally, ACDA calls attention to arguments that could be made against the suggested policy of appraisal on the basis of official U.S. records published in connection with the Treaty. (Tab E)

Whether or not the AEC interpretation is accepted by the review committee as a standard of appraisal, it can be borne in mind as possible rebuttal should any nuclear test accident,

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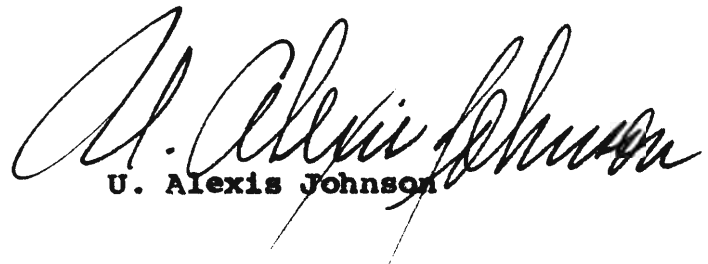
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either weapons or Plowshare, bring forth Soviet charges of Treaty violations.

In summary, we urge

- a) the question of amending the Treaty be kept under continuing surveillance,
- b) a program of Soviet and international participation and cooperation in the U.S. nuclear excavation development program be devised and carried out, and
- c) the acquisition of intelligence on Soviet interest and planning in this area be intensified.


U. Alexis Johnson

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LIST OF APPENDICES

- A. Research Memorandum (INR-9, 2/25/64) - Probable Soviet Response to a Proposal to Amend the Test Ban Treaty to Permit Detonations for Peaceful Purposes
- B. Abstracts of Articles and Other Publications Reflecting Soviet Interest in Nuclear Excavation
- C. ACDA Memorandum on Possibilities of Amending Test Ban Treaty
- D. Excerpts from Congressional Documents on the Nuclear Test Ban Treaty Related to Nuclear Excavation Experiments
- E. ACDA Memorandum (4/17/64) on Interpretation of Test Ban Treaty Provision on Causing "Radioactive Debris To be Present Outside the Territorial Limits" of a State
- F. TASS Release (FBIS BB 31 3/16/64) and Moscow Reporting Cable 3004 on Accidental Venting of Recent US Weapons Test

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By SP NARA, Date 6/10/02

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DEPARTMENT OF STATE

BUREAU OF INTELLIGENCE AND RESEARCH

DEPARTMENT OF STATE
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Research Memorandum
INR-9, February 25, 1964

To : The Secretary
Through: S/S
From : INR - George C. Denney, Jr. *G.C.D.J.*

Subject: Probable Soviet Response to a Proposal to Amend the
Test-Ban Treaty to Permit Detonations for Peaceful
Purposes

This memorandum responds to a G/PM request for our assessment of the probable Soviet reaction to a proposal to amend the test-ban treaty to permit nuclear detonations for peaceful purposes in addition to those now allowed under the treaty.

CONCLUSIONS

In view of the history of Moscow's generally negative attitude towards peaceful-uses provisions in proposed test-ban arrangements and in the absence of any evidence that the Soviet Union has any overriding requirements of its own for such detonations, we believe it unlikely that the USSR would accept a proposal to amend the treaty unless it were accompanied by an American concession on some other issue.

The Soviet Union might even regard an American initiative to renegotiate the treaty so soon after ratification as evidence of bad faith. The Soviets have committed themselves to the treaty both in their diplomatic posture vis-a-vis the free world and in

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Authority ALJ-015-003-1-3
By *dm/jc*, NARA, Date 2-24-09

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intra-bloc polemics. They might regard a move to allow additional explosions -- which in their eyes would detract from the political significance of the treaty -- as a deliberate attempt by us to embarrass them by refusing to uphold the American end of the bargain.

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Soviet Position At Geneva

Moscow has never actively sought peaceful uses provisions in a test-ban agreement, and even when the Soviets accepted such a provision in principle they sought to circumscribe it narrowly.

When Ambassador Wadsworth first tabled a draft article on peaceful-uses detonations in Geneva on January 30, 1959, the Soviets grudgingly agreed to study it. Soviet delegate Tsarapkin stated that in principle the Soviet Union would prefer that there be no nuclear detonations for peaceful purposes. However, since the US insisted, the Soviet delegation would study it, though Tsarapkin said "without particular enthusiasm." Recalling Foreign Minister Gromyko's remarks at the Supreme Soviet the previous month, Tsarapkin stated that the number of peaceful-uses detonations would have to be strictly limited and equal as between the US and UK on one side and the USSR on the other. On September 18, 1959 Khrushchev, in conversation with Ambassador Lodge, expressed his regret that the Soviet Union had accepted the idea of explosions for peaceful purposes. He said that such tests would be nothing but a continuation of weapons testing.

In April 1961 the Soviet Union again accepted in principle the idea of explosions for peaceful purposes, but sought to limit the application of it as much as possible by demanding inspection of the device to be detonated and limitation of peaceful-uses detonations to a one-to-one ratio between East and West. Later in 1961 when the Soviets announced their resumption of testing, their August 30 statement reverted to the propaganda theme that the West had sought a peaceful-uses provision as a loophole to permit continued weapons testing.

Soviet Trade Peaceful Uses for Duration Clause in Moscow

Article 2 of the US-UK draft treaty of August 27, 1962 for a three-environment ban went far to meet Soviet objections to a peaceful-uses provision. It offered the alternatives of tests carried out by unanimous agreement of the original parties or tests carried out in accordance with an annex to the treaty.

On July 15, 1963 the Soviets, in their first meeting with the Harriman-Hailsham mission, expressed their reluctance to consider even this kind of a peaceful-uses article. Indeed, Moscow proved willing to pay a price for the exclusion of a peaceful-uses article.

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The Soviets agreed to trade off inclusion of a withdrawal clause for omission of an article on peaceful uses. The trade included an understanding that the question of peaceful uses might be reconsidered by means of an amendment at some future time, and the Soviets agreed to a fairly liberal amendment procedure (which still included a veto). During the negotiations the Soviets argued that to provide for peaceful explosions would detract from the comprehensiveness and therefore from the political significance of the agreement.

Soviet Interest in Peaceful Detonations

During a conversation with Governor Harriman on July 21, 1963 (i.e., after the agreed trade-off of peaceful uses and withdrawal) Khrushchev alluded to grandiose, long-range plans for canal-building and the diversion of the Pechora River. Governor Harriman used the opportunity to ask why the Soviets had rejected a peaceful-uses article. Khrushchev said that in the future when tensions had been relieved by a test ban and other agreements, it might be possible to raise the question of amending the treaty and that at such time the idea might meet with popular approval. Khrushchev denied the existence of any immediate plans, but admitted that nuclear explosions for peaceful purposes might be useful in the future.

Clearly, Khrushchev did not envisage early amendment of the treaty, and his statements about the use of nuclear detonations for peaceful purposes were set in a vague and indefinite future.

We have no evidence of Soviet plans for the peaceful use of nuclear explosives. They do have, however, a long history of using huge quantities of conventional high explosives for various industrial projects, reportedly up to 6 or 7 KT. There is an announced plan for a 40 KT high-explosive blast at a Yakutsk coal mine. Other things being equal, projects requiring thousands of tons of TNT would certainly offer some opportunities for nuclear detonations.

On the other hand, fissionable materials are by no means surplus in the Soviet Union. It is unlikely that peaceful uses would rank very high in Soviet priorities, so long as obvious military priorities, particularly in air defense, remain unfilled. This situation is likely to continue for some time.

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Soviet Political Commitment to the Test Ban

To the extent that Moscow has banked heavily upon the test-ban not only in its relations with the free world but also as an issue of confidence in the communist world, the Soviets might take a US proposal to amend the treaty now as a deliberate move to embarrass them. The Soviets would fear that the Chinese would quickly seize upon the issue (and probably quote previous Soviet statements decrying peaceful explosions as clandestine tests) to depict Moscow as having been hoodwinked in its efforts to negotiate with the imperialists.

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Title Soviet Policy towards International Control of Atomic Energy

Author Joseph L. Nogee 59

Publisher University of Notre Dame Press, 1961

Date 1949

Notes: Vyshinsky's Nov. 10, 1949 U.N. speech on the Soviet Union's peaceful uses of atomic energy. "It was using atomic energy for purposes of its own domestic economy: blowing up mountains, changing the course of rivers, irrigating deserts, etc." Pravda, in printing this speech, quoted him as saying the Soviet Union intended to blow up mountains, etc

Ref's UN, ORGA, Fourth Session, Summary Records --- 1949 Pravda, Nov. 17, 1949

Title Beginning of an Era of Atomic Energy

Author G. I. Pokrovskii

Publisher & Date Tekhnika Molodezhi No. 9, 1954

Translation University of California Radiation Laboratory, Trans. No. 358 (L) Jan. 20, 1958

Notes An interesting quotation from this paper: "American atomic experts consider it unprofitable to use nuclear explosions for mining or mineral resources. Progressive science claims that it is possible to utilize the noble force of the explosion builder for peaceful purposes. The powerful energy of the atomic nucleus permits the rapid building of hydraulic works which we have already described in our journal. With the help of directional explosions one can straighten out the beds of large rivers to construct gigantic dams, to cut through canals literally in a few minutes whose construction by ordinary machine would be prolonged for years. For miners it need not be necessary to descend into deep shafts. With explosions it will be possible to open up an earth strata to a great depth and to replace tunnels with open earth quarries."

Title On the Use of Nuclear Explosions for Industrial Purposes

Author G. I. Pokrovskii

Publisher & Date Gorny Zhurnal, Vol. 1, No. 5, 1956 pp. 26-32

Trans. AEC-tr-4005

Notes "This paper describes the engineering advantages to use of nuclear explosives, fission and fusion, for large scale excavation. The author estimates as to the size and cost of NE and its effectiveness; considers radioactive contamination problem, safety of blasting personnel and time for reentry to area. He concludes: "With the data now available, however, we can say that radioactive contamination in a nuclear explosion should not be considered an insurmountable obstacle to the use of such explosions in mining and construction. On the basis of the many advantages of nuclear explosions, we conclude that the time is ripe to begin actual experiments in this field."

Title Constructive Explosions - China

Author G. I. Pokrovskii

Publisher & Date Tekhnika Molodezhi No. 7, July 1957

Trans. UCRL - Trans. 358 (L), Jan. 20, 1958

Notes Describes the 9,200 ton chemical explosion used near Lanchow China to open a quarry for extraction of minerals. This is the largest known chemical explosion accomplished for peaceful purposes.

Title "Action of Shock and Explosion in Deformable Media"

Author G. I. Pokrovskii and I.S. Fedorov

Publisher & Date Moscow State Publisher, Moscow, 1957

Trans. UCRL-Trans_777 (L), 1961

Notes This is apparently a basic text on the subject and deals with both theory and practical applications, including "directed explosions". In the literature cited, it is interesting to note that Pokrovskii's earliest (listed) published work in this field is 1937. This was followed by others in the period 1938 to 1953.

-3-

Title Utilization of Radioactive Isotopes for the Study of Explosions
 in Mining

Author G. I. Pokrovskii and A. A. Chernigovskii

Pub. & Date State Scientific - Technical Pub. House, Moscow, 1958

Trans. AEC-tr-4475, Apr. 1961

Notes Describes small scale experiments using 1.3 gram charges in moist
 sand and radioactive tracers (P32) to study the trajectories of
 material ejected in cratering explosions. Derives the theoretical
 curves and experimental curves of ejection angles and dispersion.
 Discusses the safety precautions necessary in handling the radioactive
 isotope, phosphorus 32, used in this work; and reasons for its choice.

Title Atomic Energy in the Soviet Union

Author Arnold Kramish

Pub. & Date Stanford University Press, 1959

Notes Contains a chapter titled, "The Generals Plowshare" in which he
 describes Soviet interest in the peaceful uses of nuclear explosives
 and gives references to five Russian articles. He cites examples of
 Soviet HE work such as the three large explosions in China, the
 Tagansai 1000 ton experiment, and the Aigara River proposal. The
 author also gives some biographical information on Pokrovskii:
 "The outstanding and virtually the only public spokesman for such
 applications in the Soviet Union has been Doctor of Technical Sciences,
 Professor Georgii Iosifovich Pokrovskii, Major General of Engineering
 Services. General Pokrovskii has the distinction of being the most
 prolific spokesman on almost every technical matter, with major
 emphasis on atomic energy and space travel, in the Soviet popular and
 technical press. A professor at the Zhukovskii Military-Aviation
 Engineering Institute, Pokrovskii is a man of some technical ability,
 having originally been a nuclear physicist who in the 1930's switched
 to problems of soil mechanics. During the war he worked on problems
 of conventional explosives and the development of shaped charges; so
 his general background should make him an expert on the moving of
 earth by means of nuclear explosions."

Title "Frontiers in Atomic Energy Research" Hearings before the Subcommittee on R&D. of the JCAE, Mar. 22-25, 1960, pp 61-81.

Author Dr. Gerald Johnson

Publisher and Date U.S. Government Printing Office, 1960

Notes He speaks about Russian high explosive work and notes that the data from these explosions would be useful to our Plowshare program. A few of his conclusions regarding the Soviet work are interesting: "The data they have developed in these explosions and they have been very careful to take advantage of them from a scientific standpoint, could made a major contribution to the peaceful uses of explosions, either chemical or nuclear." "They are certainly developing the technique so that the crossover to nuclear explosion techniques would be relatively simple." "They now have all the necessary data with high explosive experiments to proceed directly to nuclear projects, if they have not already done so."

Title Memorandum to the AEC Commissioners - Subject: Soviet Detonations for Industrial or Research Purposes (Document is S-DI)

Author Maj. Gen. A. D. Starbird

Date Oct., 1960

Notes Contains an OVO list of announced Soviet HE detonations from Jan. 1931 to 1960, supplemental information from G. Johnson on three other Soviet HE tests in 1959, and a list of four planned experiments for seismic research.

Title Memo for the Record: Summary of Contacts with Mr. Lancelot Fekete

Author John S. Kelly

Date April 27, 1961

Notes "During this recitation, he told me that he had become acquainted with a U.S.S.R. citizen named Andreyeff in Venezuela and that Andreyeff alleged to be a classmate and close personal friend of Marghall Zuhkov. He said that Andreyeff told him that the U.S.S.R. is, or has been, using nuclear explosives in an iron ore mining operation near Magnitozorok and to remove overburden from a coal mine in northern China."

Title	Tass Report from Moscow
Date	June 11, 1961
Notes	"Preparations are underway in the foothills of Tienshan, Uzebkistan, for blasting a hugh mass of rock, Pravda Vostoka writes today. For the first time in the world 30,000 tons of explosives will blast 14.5 million cubic meters of rock rich in ores."

Title	Project Plowshare
Author	Ralph Sanders
Publisher & Date	Public Affairs Press, Wash., D.C., 1962
Notes	This book contains a chapter titled: "The Soviet Stake" in which the author describes Soviet explosives development and planned projects involving large dams, canals, etc. and makes the point that most would benefit by the use of nuclear explosives in the construction. He concludes: "In Summary, the Russians clearly recognize the significance of earth moving; otherwise they would not have pushed the state of high explosives art so vigorously. They know also that the greatest artistry in chemical high explosives will not overcome inherent limitations. The Soviets already are pushing chemical explosives into the area of marginal returns. They, too, are aware that above 10 kilotons, earth movers must enter a nuclear realm.--- and generally if they want to exploit their resources to the maximum, they seem destined to press nuclear dynamite into their service. Sooner or later, political considerations will give way before economical necessity. Ultimately, the Soviet Government will develop this new tool. It will unquestionably find convenient political justification for doing so."

Title The Use of Explosives in Sino-Soviet, Industrial and Scientific Projects and Research

Author HQ, USAF, May 1963

Classification S-RD
of Document

Notes Describes deep-hole boring projects and other seismic and geological research. Describes also conventional industrial chemical explosions for construction of dams, reservoirs, mountain passes as well as for the discovery and crushing of minerals. This report indicates the broad scope of Soviet experience in the field of large scale explosions as background relevant to possible extension into the nuclear range.

Title Reds Fired A-Blasts in June, Intelligence Data Indicates

Author Earl H. Voss

Pub. & Date The Evening Star, Wash., D.C., Oct. 7, 1963

Notes Information indicating possible nuclear cratering shots near Semipalatinsk in June 1963.

Title "Nuclear Test Ban Treaty" Hearings before the Committee on Foreign Relations, U.S. Senate, Aug. 12-27, 1963

Author Dean Rusk

Pub. & Date U.S. Government Printing Office, 1963

Notes On p. 26 Rusk says, "Indeed, I think we may well get from the Soviet Union at some stage information that they themselves want to use an underground explosion for a particular peaceful uses purposes."

Title Discussions between the East and the West

Author Alvar Sundell, Finnish MP

Pub. & Date Swedish-language newspaper Hufuudstadsbladet

Source Dept. of State Airgram from American Embassey, Helsinki, Finnland, Feb. 22, 1964

Notes Article describes the East-West Roundtable Conference on international questions, in Moscow, Dec. 1963, which the author attended. He notes: "The conference pointed out that the Moscow Treaty has paved the way for new negotiations and it appealed to world opinion and to governments, especially to those responsible for the Geneva talks, that the following steps be taken without delay and independently of other measures and agreements related to general disarmament. Specific measures were mentioned, such as: 1. Cessation of underground nuclear tests and explosions, with the exception of those for scientific and technical purposes, under international control."

Title The Peaceful Atom in Foreign Policy

Author Arnold Kramish

Pub. & Date Harper and Rows, 1963

Notes Contains a chapter titled, "Into Plowshares" in which the author states: "At the 1959 Geneva Talks on the cessation of tests, the Russians proposed that Plowshare activities should be conducted on a 50-50 basis; i.e., every time the United States detonated a bomb the U.S.S.R. would perform a single Plowshare experiment, or vice versa. This suggestion was open to two interpretations. The pessimistic view was that the Soviet proposal amounted to a veto of Plowshare; if the Russians maintained that they never wished to detonate a Plowshare bomb, this would prevent the United States from using the device. The other interpretation was that the Soviets did not wish to deprive themselves of operating in this promising area and hence would interpose no objections on a one-for-one basis. Indeed, the Russians could contribute significantly to an international Plowshare effort, for they have had much more experience than any other nation in conducting very large earth-moving explosions as a part of large-scale, long-range plans for the "changing of Nature." "

Title Engineering Properties and Applications of Nuclear Excavations

Author Louis J. Circeo, Jr.

Pub. & Date Univ. of Calif. Radiation Laboratory, UCRL 7657, Feb. 5, 1964

Notes This report contains a section on: "Soviet use of Large Scale Explosions" with nine references to Soviet publications. The author cites examples of their work such as dam construction, overburden removal for mining, cuts for railroad beds, canals, etc. He also describes planned Soviet large scale projects in the range of 16-40 kilotons. The author states: "All Soviet projects thus far have been conducted with chemical explosives. Published reports have indicated that future projects will also use only conventional explosives. It is not known if research is being conducted into the possible use of nuclear explosives for engineering purposes. However, the Soviets know of the great economic advantage of nuclear explosives and that radioactivity can be adequately controlled. The yields of the explosives for these projects are definitely in the range where nuclear explosives would be economically justified. --- It would be reasonable to assume that serious consideration is being given to the use of nuclear explosives in the future."

Title Russian News Service Article
Date August 21, 1963
Notes Reports the use of a powerful directed explosion in the construction of a deep canal through a rocky ridge.

Title USSR Regional Affairs
Date October 17, 1963
Notes Reports the planned use of 7000 tons of HE (ammonite) in the construction of a large dam near the city of Alma Alta. "The explosion, the largest in history for the size of a single charge, will lift and replace 5 million cubic meters of granite."
Ref. Moscow Tass English October 9, 1963

Title The Taming of Explosions (Translation)
Author C. Reznik
Pub. & Date Nauka i Zhizn (Science and Life), Moscow, No. 1, January 1962
Notes Describes some of the work being done at the Institute of Hydrodynamics Siberian Branch at Novosibirsk in the field of controlled explosions. "The basic idea behind the theory of controlled explosions are those of the director of the Institute, the academician M. A. Lavrentyev and his students, V.M. Kuznetsov and Ye. I. Sher." The work is done on a test range below Novosibirsk in cooperation with the Soyuzvzeyvprom Trust (Union Explosives Industry). The head engineer is M.M. Dokuchayev and the head engineer of the industrial experimental branch of the trust is L. A. Paporotskiy.

Title Conversation between Milo Nordyke, LRL and M. A. Lavrentyev,
 Inst. of Hydrodynamics Novosibirsk.

Date January 16, 1964

Notes Lavrentyev indicated that the planned date for the Alma Alta
 detonation is May 1964, and described the project as using two large
 explosions to induce landslides to form a dam. He stated the
 purpose of the 1000 ton HE explosion near Tashkent in 1958 was
 principally directed toward determining the proper scaling laws for
 such explosions. In discussing the U.S. Sedan event, Lavrentyev
 raised the point of what was considered an underground explosion
 under the new Treaty. He concluded that the critical point was
 the amount of radioactivity that escaped to the atmosphere.
 Nordyke expressed the hope that events similar to Sedan could be
 done within the framework of the Treaty. Lavrentyev said he thought
 an agreement could be worked out which would permit such projects.
 Later in the day, in response to a question, Lavrentyev agreed that
 from a technical viewpoint, the use of nuclear explosives in large
 scale construction projects was feasible.

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UNITED STATES ARMS CONTROL AND DISARMAMENT AGENCY

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MEMORANDUM

SUBJECT: Test Ban Treaty Limitations on Plowshare

We agree with the conclusion indicated in INR-9, February 25, that it would not be feasible at this time to obtain Soviet concurrence with a modification or clarification of the provisions of the limited test ban treaty which have the effect of prohibiting any underground nuclear explosion for peaceful purposes which "causes radioactive debris to be present outside the territorial limits of the State under whose jurisdiction or control such explosion is conducted."

The most likely opportunity for raising the question of the conduct of nuclear explosions for peaceful uses will probably be in the context of future international discussion of a comprehensive test ban. Both the United States and the Soviet Union are officially committed to pursue this objective, and the difference in the extent of underground testing to date by the two powers might result in increasing Soviet desire to reach agreement on this subject. Moreover, research in the DOD VELA program indicates that further improvements are possible in the detection and identification of underground nuclear explosions by control posts located outside the Soviet Union. Within perhaps nine to twelve months the analysis and integration of this research may have reached the point where new U.S. proposals might be possible.

In past negotiations for a comprehensive test ban, the problem of peaceful uses has been a central issue (See Geneva Conference on the Discontinuance of Nuclear Weapon Tests: History and Analysis of Negotiations, State Department Publication 7258, Oct. 1961, pp. 265-270). It would be quite natural to raise the issue again when negotiations for a comprehensive ban are

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By JP NARA, Date 6/10/02

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renewed. We could raise the problem of peaceful uses explosions which cause debris to be present beyond the borders of the country conducting the explosion as well as that of explosions which do not. By that time our bargaining position might be still further enhanced if we should detect radioactive debris beyond the borders of the Soviet Union from one or more of their underground tests.

Given Soviet interest in the underground test ban (or, of course, in conducting their own peaceful uses explosions), there might be a possibility of negotiating procedures for peaceful use explosions acceptable to both sides. In any event, renewed negotiations for an underground ban appear to offer the best opportunity for raising the problem with the Soviets.

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EXCERPTS FROM DOCUMENTS ON THE NUCLEAR TEST BAN TREATY
RELATED TO NUCLEAR EXCAVATION EXPERIMENTS

I. Excerpted From the Hearings on Nuclear Test Ban Treaty
Committee on Foreign Relations, U. S. Senate

p. 2. Hearings. Excerpt from President's letter of Aug. 8, 1963
transmitting treaty to Senate.

"It permits nuclear tests and explosions underground
so long as all fallout is contained within the country
where the test or explosion is conducted." /underscoring supplied/

p. 3. Hearings. Excerpt from above letter.

"Continued research on developing the peaceful uses of
atomic energy will be possible through underground
testing."

p. 5. Hearings. Excerpt from Mr. Ball's letter of Aug. 8, 1963,
to the President.

"Underground nuclear explosions are not prohibited so long
as they do not cause radioactive debris to be present
outside the territorial limits of the State under whose
jurisdiction or control such explosions are conducted.
Thus, so long as adequate precautions are taken to
prevent such spread of radioactive debris, the treaty
will not prohibit the United States from conducting
underground nuclear weapons tests or underground
nuclear explosions for peaceful purposes."
/underscoring supplied/

p. 25-26 Secretary Rusk. "Yes, Senator Anderson, as far as peaceful
uses are concerned, as you know, sir, the principal experiments
with regard to peaceful uses have been going on underground,
and this is aimed at developing the type of explosive capacity
which could be safely used for peaceful purposes.

To make it workable it could not contaminate the immediate
environment or contaminate the atmosphere. As Dr. Seaborg will
explain when he comes here, these experiments will continue
underground and these are experiments which are peculiarly
fitting for peaceful uses purposes.

"Now, if we get to the operational aspect of peaceful uses, suppose there is a harbor to be dug, a canal to be dug, if we have perfected the technique by which, through which we ourselves will be prepared to use nuclear explosions for peaceful purposes, then I should think it would be entirely manageable insofar as this treaty is concerned because we would not want a massive contamination of the environment or massive or large fallout going all over the landscape, and many of the peaceful purposes that I have looked into are, in fact, related to underground explosions for these major engineering projects.

"So, I think we have a very large area of experimentation and freedom of action with regard to peaceful uses, taking into account what can be done within the treaty and taking into account the circumstances under which we ourselves would or would not wish to use nuclear materials for peaceful purposes."

p. 181, 182. Senator Cannon. "Now, I think I understand correctly that this treaty would in effect prohibit any of the plowshare tests; is that correct?

Secretary McNamara. "No, sir -- let me first say that I really think Dr. Seaborg should answer this question. I understand from the chairman he will testify tomorrow.

I would simply say, 'No, it will not prohibit tests underground to perfect plowshare instruments' -- by instruments I mean the technical devices. But it might prevent the application of those devices in a project such as an Isthmian Canal, across the Isthmus of Panama.

Senator Cannon. "Or the harbor project that was talked about in Alaska?

Secretary McNamara. "I think that would depend upon circumstances, whether the explosions were underground and whether the fallout or other radiation and debris passed beyond the territory limits of the United States." *

p. 210-211. Dr. Seaborg. "The Commission has received literally dozens of suggestions for using nuclear explosives in excavation projects in the United States and elsewhere in the world. These include digging canals and harbors, clearing navigation

* underscoring supplied

obstructions, and cutting passes through mountains for land transportation.

"A new trans-Isthmian canal is an interesting example; however, it probably could not be done under the present treaty limitations because of the short distance to territorial boundaries.

.....
"The various applications envisaged require the development of nuclear explosives with specific characteristics. For example, excavation requires nuclear explosives especially designed to minimize the production and release of radioactive debris. This requires devices which utilize very little fission energy and in which precautions have been taken to greatly minimize induced activity.

Devices which can be used in large-scale excavation projects should be available after 2 to 3 years of test explosion experimentation. Other applications require different devices.

Even though these devices are being developed and tested specifically for Plowshare, they utilize the most sophisticated design principles we know. This device development can be carried out deep underground in the manner used for weapons testing.

A series of experiments has been planned to develop nuclear excavation technology. An important part of this program is to refine the techniques of entrapping radioactive debris underground. This program requires about two experiments per year. We expect that in 4 or 5 years both the devices and technology* will be available to undertake almost any of the many worthwhile projects which have been suggested; selected projects may be undertaken earlier as part of the experimental program."

- p. 211. Dr. Seaborg. "Our present considerations lead us to believe that excavation experiments or projects which have a downwind distance of several hundred miles from the project site to a territorial limit probably can be conducted, and that these experiments will be sufficient to develop the excavation technology. We believe that the Plowshare program

* underscoring supplied

has a great potential for the benefit of mankind. We believe that within the next few years this potential and the safety aspects can be demonstrated within the terms of the treaty." *

- p. 213. The Chairman. "With regard to your comments about the Flowshare program, if I understand you correctly, you feel that under this treaty, the development of the techniques to be used is in no way restrained. That the only restraint would be in specific cases such as the one mentioned regarding an Isthmian canal where the territorial limits are quite restricted. In many cases within a large area such as our West, in this country, you could still, within the treaty, proceed to apply whatever techniques are appropriate, is that correct?

Dr. Seaborg. "Yes. Specifically, we feel that we could develop the devices themselves which clearly can be perfected by underground explosions, completely contained explosions, and we can also develop a good deal of the excavation technology through properly devised experiments in which these explosives were used for earth-moving purposes." *

Also, some of the other experiments having to do with the development of oil resources and water resources and so forth can be carried out in completely contained underground explosions.

The Chairman. "That is very reassuring to me."

- p. 239 - 240. Dr. Seaborg. "I am sure you are referring to the possible peaceful application of nuclear explosives; that is, our Flowshare program, and here we feel that it will be possible to develop the nuclear devices required for the various aspects of the Flowshare program, and to carry out a number of the experiments required for the use of these nuclear devices to develop such technologies as excavation and earthmoving experiments in general. And, in addition, to carry out a number of the practical applications such as excavations within the United States* and other practical applications such as aids to mining, aids to the recovery of certain types of low-grade oil, the development of underground water resources, and above ground water reservoirs, and things like that, within the United States.

.
"It will not be possible at the present time to apply

* underscoring supplied

nuclear explosives to excavation experiments where the debris, detectable amounts of radioactive debris, will be found and be detected outside of the continental limits of the country where the experiment is performed.

"This, then, for a while, until the treaty is amended, means that these kinds of applications could not be carried out.

However, in the meantime, a large part of the Plowshare program, much of which must precede these applications in other countries before they could be carried out in the other countries, can be carried out under the treaty.

Senator Carlson. "Doctor, I take it from earlier testimony that we had from Secretary Rusk that such excavations, as the construction of a canal across the Nicaraguan Isthmus, or maybe the opening up of some barriers to a great harbor in Alaska, would not and could not be permitted under this treaty. Is that your understanding?

Dr. Seaborg. "I think that a harbor in Alaska probably could not now be built until the treaty is amended. Other projects, inland projects, of which we had some in mind, the building of dams, and so forth, in Alaska probably could now, or as soon as the explosives and the excavation technology is ready which is not yet the case -- such projects could be carried on under the treaty now. *

Senator Carlson. "Let's assume under the treaty that your experimentations and your studies would permit us to state that we are now ready to move a mountain in the United States or in Russia, for instance. Under the treaty could we do that?

Dr. Seaborg. "Under the treaty we probably could do that. We would have to develop the proper nuclear explosives before we would be ready to do that. We wouldn't be ready with the explosives at the present time but would require a few more years of experimentation both with the development of explosives themselves and with the excavation technology before we would be ready for such a project whether there was a treaty or not. But under the treaty, after the development of these proper explosives, which means clean explosives, and the development, the experimental development of the excavation technology.*

* underscoring supplied

after we learn how to use these in experiments to move large amounts of earth, we feel that under the treaty we could perform such a mountain-moving experiment within the continental United States, yes, sir, Senator Carlson.*

Senator Carlson. "Let's assume that Russia decided that they wanted to use nuclear power to remove some great obstruction internally, a mountain, for instance. Your instruments, I gather, would record that explosion. Would we know from the instruments that you have whether this was an explosion for constructive use, peaceful use, or for military experimentation and improvement of nuclear bombs?

Dr. Seaborg. "There wouldn't be any prohibition so far as our instruments recording the explosion is concerned. The prohibition would lie in whether there was a detectable amount of radioactive debris actually detected in sufficient detail so that it could be identified as an explosion within the Soviet Union. Only if sufficient radioactive debris were detected outside of the Soviet Union would it be prohibited.

Senator Carlson. "It occurs to me that we are just on the verge of a new era in the field of peaceful uses such as excavations for very important projects. I take it from your statement you feel that nothing in this treaty will seriously retard that program.

Dr. Seaborg. "That is right, for a number of years. However, in a few years the treaty would require an amendment, if we were going to be able to go forward at that time to do the things that the technology would permit by that time."

p. 265. Senator Pastore. "Now, how much does this disturb us or what disadvantage or inconvenience is this going to be?

Do we have any immediate plans to begin exploding atomic energy to build canals or to build harbors or to blow up mountains? We have no such program contemplated now, do we?

Dr. Seaborg. "We are not ready. It will take a few years of device development and experiments in excavation technology* before we would be ready, and those things can be accomplished under the treaty. Also some practical applications of actual

* underscoring supplied

excavation within the continental United States, when we are ready, can take place within the treaty. *

I am not disturbed about the treaty."

- p. 294. Senator Curtis. "I understand peaceful purposes are clearly prohibited, because it was in the previous draft where it was removed from this one at the request of the Communists; isn't that correct?

Senator Sparkman. "Excluded except when it is done within a country without the eruption of debris into any other country. We could use them in the interior of the United States, provided we kept it protected. *

- p. 370. General LeMay. "I would think that we could carry on a reasonable program for peaceful purposes under the treaty. We may have to do some things in more expensive ways or different ways than if we did not have the treaty. But I think we can carry out a peaceful program for peaceful purposes all right.

For instance, in digging such a reservoir as you are talking about, or digging a canal, or things of that sort, certainly we wouldn't want to do this unless we could do it with clean explosions. We certainly don't want to contaminate the area. So I would think that the explosions then could be done under the treaty, and that no contaminated debris would leave the borders of the country concerned. So I would think that we could carry on a reasonable program for this purpose."

- p. 645 - 646. Senator Sparkman. "I won't be positive of that but my recollection of some phases of the discussion that was held is that it was subject to the control of the country in which it was carried out. But anyhow, we could carry on our own peaceful uses inside the United States, could we not?

Dr. Libby. "That is correct, sir, and I think this will allow us to do a considerable amount of development work.

Senator Sparkman. "That is exactly the question I was going to ask. Did you not believe that there was the possibility of developing a great deal of information and new techniques?"

* underscoring supplied

Dr. Libby. "Yes, sir.

"In earth moving, though, Senator, we are fairly far enough along now and except for cleaning up more we are about ready to go to work, I would say, before too long. So it is a question, I am not sure it will be too long before you will want to seriously consider Panama or some project of that kind.

Senator Sparkman. "Yes. But, of course, I understand you don't make the positive statement there that we ought to oppose the treaty but that we ought to study that proposition very carefully, is that not right?

Dr. Libby. "Yes, sir; it is an important point."

p. 681. Senator Sparkman. "Let me say that that again was one of the first points that we inquired about when the tentative treaty was before us, and we were assured that the use of atomic energy for peaceful purposes did permit the use of atomic explosions for peaceful purposes as long as there was no debris thrown into any other country. Certainly all the testimony before us is that here within the continental United States we can carry on whatever we wish. It is my understanding also we can do that in any friendly power -- any power which asks us to do it, as long as we contain the debris within that country."

II. Excerpted From Hearings Before the Subcommittee of the Senate Committee on Appropriations on Public Works Appropriations, 1964

p. 10. Excerpt from Attachment to Letter dated 11/18/63 from Chairman Seaborg to Senator Hayden requesting restoration of certain reductions in AEC's FY 1964 appropriations made by the House of Representatives.

".... the treaty does not prohibit Plowshare tests. Its relation to Plowshare is simply that it prohibits any nuclear explosion which would cause radioactive debris to be present outside national boundaries. Thus, the treaty really limits only that part of the program in the fiscal year 1964 budget which contemplated large-scale cratering experiments which might have caused radioactive debris to be present outside U. S. boundaries."

* underscoring supplied

.. .. .
"It has recently been concluded that it is necessary to increase tests to develop cleaner nuclear explosives and to carry out small scale excavation experiments to advance the technology in the near future in lieu of the large scale experiments.*

.. .. .
This revised program can proceed under the terms of the treaty and important progress can be made.* Furthermore, such a program is necessary to and consistent with the administration's assurances to the Senate and with the basis for the Senate's advice and consent to the treaty."

p. 52. "Dr. Seaborg. We are developing the explosives that are needed, and the technology for using these explosives,* on a program time schedule which could lead to a sufficient technology to dig a major canal -- for example, a second canal against the Isthmus -- in about 5 years."

Senator Pastore. "..... What have you got to say to the argument which was made at the time of the nuclear test ban agreement hearing to the effect that much of this work at the present time, unless an exception is worked out, would be in violation of the nuclear test ban agreement?"

"Dr. Seaborg. The work in fiscal years 1964 and 1965 wouldn't have this problem. This program envisages the conduct of underground nuclear tests to develop the clean nuclear explosives that are required, and certain other underground tests, and possibly some very small earthmoving experiments* that would not have any chance of injecting sufficient radioactivity into the air to violate the test ban agreement."

p. 54. "Dr. Seaborg. I think that we can develop a device that will be so relatively fallout free that we could, I don't know how soon, conduct a large excavation experiment within the boundaries of the United States that would not violate the test ban treaty.*

Then before we could actually use this to dig a harbor or a canal across the isthmus or what-have-you, we would have to have a modification in the treaty."

* underscoring supplied

III. Excerpted From the Report of the Committee on Foreign Relations, U. S. Senate, September 3, 1963

p. 20. "THE FLOWSHARE PROGRAM"

"The committee understands that the Flowshare program, which involves the use of nuclear devices for peaceful purposes, will not be seriously inhibited by the treaty. A great many, if not most, of such projects can be conducted underground and within the limits of the treaty. Dr. Seaborg testified at length on this question and said:

"Device development and the program for scientific studies planned for the immediate Flowshare program can clearly proceed under the terms of the treaty. This is also true of applications for mining and water resource developments which would be carried out deep underground and involve the release of very little, if any, radioactivity.

"In the excavation application, however, some radioactivity will reach the atmosphere and a careful determination will have to be made that a given project is permissible ***.

"Our present considerations lead us to believe that excavation experiments or projects which have a downwind distance of several hundred miles from the project site to a territorial limit probably can be conducted, and that these experiments will be sufficient to develop the excavation technology.

"The United States will also be able to explode nuclear devices underground for peaceful purposes in other countries, at their request, provided, of course, that such an explosion does not cause debris to be issued beyond that country's territorial limits. If and when a project is proposed that might possibly violate the terms of the treaty--development of a new Panama Canal with nuclear explosives, for example--an amendment to the treaty presumably would be sought. The treaty will, however, prevent certain nuclear experiments in outer space that have been considered."

IV. Excerpts From the Congressional Record: Formal Debate
on the Nuclear Test Ban Treaty

Vol. 109, No. 141. Sept. 9, p. 15680

Fulbright. "Third, questions were raised at the hearings as to whether nuclear explosives could be used for peaceful purposes -- in our terminology, Plowshare. I came away from the hearings with the feeling that the Plowshare program was important not only to us but to the economic improvement of the world and, therefore, certainly when we consent to this treaty, we should make it clear to the executive department of our Government that this must be worked out. We were assured by responsible witnesses that it could be and would be done."

Vol. 109, No. 146. Sept. 16, p. 16189 (Sparkman answering Mrs. Smith's question)

"Fifteenth. What will be the effect of ratification upon our Plowshare program -- a project designed to deepen harbors, dig tunnels and canals, or otherwise cause beneficial changes to the topography through controlled and contained nuclear explosions? Answers: Dr. Seaborg, in his testimony before the committees, replied as follows on the restraints imposed on the Plowshare program if the treaty is ratified:

'Specifically, we feel that we could develop the devices themselves which clearly can be perfected by underground explosions, completely contained explosions, and we can also develop a good deal of the excavation technology through properly devised experiments in which these explosives were used for earthmoving purposes.

'Also some of the other experiments having to do with the development of oil resources and water resources and so forth can be carried out in completely contained underground explosions.' President Kennedy in his September 10, 1963, letter to Senators Mansfield and Dirksen, wrote:

'The United States will diligently pursue its programs for the further development of nuclear explosives for peaceful purposes by underground tests within the terms of the treaty, and as and when such developments make possible constructive uses of atmospheric nuclear explosions for peaceful purposes, the United States will seek international agreement under the treaty to permit such explosions'."

Vol. 109, No. 148. Sept. 18, p. 16497

Miller. "Through the use of nuclear explosives which produce little radioactivity and by placing them underground so that nearly all of the radioactivity is trapped, projects could be undertaken at a fraction of the cost required by conventional methods. We have been assured that under the treaty we can continue experiments, and, to the extent that detectable amounts of nuclear fallout do not go beyond our own territorial limits, application of these experiments to mining, recovery of oil and gas, water development, and the construction of harbors can be made.* However, construction of a second Panama Canal and other applications which would entail detectable amounts of fallout beyond our own territorial limits cannot be undertaken."

Vol. 109, No. 149. Sept. 19, p. 16654

Carlson. "Because of this lack of trust, our negotiators placed language in this treaty that inhibited the Plowshare program. How much has that program been inhibited? This question bothered me and I asked Dr. Glenn Seaborg, Chairman of the Atomic Energy Commission, about it. He answered by noting that the treaty would not inhibit the peaceful uses program in the fields of nuclear power, nuclear energy for propulsion and the use of isotopes in medicine, industry, and research.

As for the field of nuclear explosions, Dr. Seaborg said that within the United States certain excavations could be undertaken along with work in the areas of mining and development of underground water resources.

"Larger projects, such as canal and harbor building and mountain moving, Dr. Seaborg noted, depend upon development of nuclear explosives and associated excavation technology which were not presently available. It is my understanding that the administration foresees needing the next few years to develop our capabilities in this large scale excavation area and then plans to approach other treaty signatories on a project-by-project basis as each one becomes feasible. By then, perhaps, if the treaty has been adhered to, we may have built up enough trust between the Soviets and ourselves that they will permit us to observe their peaceful explosion experiments and we -- as we have offered in the past -- will invite them to observe ours."

* underscoring supplied

Vol. 109, No. 151. Sept. 23

Humphrey. "Fourth. Concern has been expressed that the treaty will significantly inhibit the US Plowshare program for the peaceful use of nuclear explosions.

Answer: The Chairman of the Atomic Energy Commission, Dr. Seaborg, testified that a great many of the presently proposed Plowshare projects can be conducted underground under the terms of the treaty while others for which we are not yet technologically ready can either be conducted under the terms of the treaty or made the subject of future amendments."

V. Excerpt From President Kennedy's Letter of September 10, 1963 to Senators Mansfield and Dirksen

"The United States will diligently pursue its program for the further development of nuclear explosives for peaceful purposes by underground tests within the terms of the treaty and as and when such developments make possible constructive uses of atmospheric nuclear explosions for peaceful purposes, the United States will seek international agreement under the treaty to permit such explosions."

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UNITED STATES ARMS CONTROL AND DISARMAMENT AGENCY

April 17, 1964

Memorandum Re Interpretation of
Test Ban Treaty Provision on Causing
"Radioactive Debris To Be Present Outside
the Territorial Limits" of a State

The only limitations placed by the test ban treaty on an underground nuclear explosion (regardless of whether it is a weapons test or for a peaceful purpose) are (1) that it be in fact underground--i.e., not "in the atmosphere, beyond its limits, including outer space, or underwater", and (2) that it not cause "radioactive debris to be present outside the territorial limits of the State under whose jurisdiction or control such explosion is conducted."

NSAM 269 established a procedure for the review of proposals for nuclear detonations as to which "there is a significant possibility that the test will place measurable amounts of radioactive debris beyond the boundaries of the United States under circumstances in which the debris could be credibly related to the test," or for "any other nuclear test which by its nature could reasonably give rise to domestic or foreign charges of a violation of the Nuclear Test Ban Treaty... even though the sponsoring agency believes that the charges would be unfounded." The Committee it established advises the President as to whether or not proposed detonations are "acceptable under the Nuclear Test Ban Treaty."

It is the purpose of this memorandum to point out some of the factors that ACDA believes should be taken into account in assessing the approach suggested by the AEC and discussed on pages 3 and 4 of the basic memorandum.

International Impact

It is important to identify the possible international political consequences of adopting a test for acceptability

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By JP, NARA, Date 6/10/02

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under the Nuclear Test Ban Treaty which is not agreed to or accepted by the other parties to the treaty.* It will be noted that all of the principal benefits of the treaty which led us to sign it could be at least partially nullified. These consequences include:

1. Unfavorable impact on Soviet leadership as regards our willingness to keep disarmament treaty obligations, opening Soviet leaders to criticism from extremists within the Soviet Union and within the bloc (especially China), thus making it more difficult for the Soviets to pursue their present more reasonable course in East-West relations.

2. Providing the Soviets a pretext which they could seize if they should wish to reverse their present softer line.

3. At the least, Soviet bloc exploitation of the claimed violation, either to create adverse propaganda or as a basis for permitting corresponding action on their own part.

4. Unfavorable reception from other countries of what would probably be construed as a violation of our obligations under the test ban treaty.

5. Disappointment of world opinion with regard to the expected decrease in fallout as a result of the treaty, even if additional doses actually were very small, as there is no established threshold below which there is no genetic damage.

6. Some weakening of the pressure we can bring to bear against China and France for not becoming parties to the treaty, and weakening of the forces opposed to acquiring nuclear weapons in other countries as well.

*In this connection, attention is called to the Tass news despatch on the venting of a recent Nevada test, and cable 3004 from Moscow to the Department of State, dated March 27, 1964--both furnished under separate cover.

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-3-

7. Possible reversal of our present relatively favorable image in disarmament negotiations, and in particular opening us to the charge that we are expanding the scope of testing instead of seeking to end all tests in accordance with our declared policy.

Some of these consequences might be at least partly mitigated if we were to detect outside the borders of the Soviet Union debris from Soviet underground nuclear explosions.

Origins and Published Legislative History of the Treaty Provision

The origin of the treaty clause discussed above was the United States draft partial test ban treaty, submitted to the Geneva conference on August 27, 1962. The wording of the clause was taken verbatim from this draft. There is an extensive public record relating the history of this treaty and the United States debate on its ratification. Since this record is readily available to the other parties, they could use excerpts therefrom (such as those discussed below) as a basis for arguing that the United States was violating the treaty if radioactive debris from its explosions were picked up beyond U.S. borders, even though the concentration of such debris was small in relation to the maximum permissible concentration adopted as a radiation protection guide.

The following are some of the materials from the public record that might be used to support such an argument:

1. The U.S. draft of the treaty tabled at Geneva in 1962 and originally considered at Moscow contained an article which would have excepted nuclear explosions for peaceful purposes from the prohibition on causing radioactive debris to be present outside the territorial limits of the country where they were conducted, provided such explosions were consented to or their peaceful purpose was

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-4-

verified in accordance with an annex. However, this article was excluded from the final treaty.

2. In the hearings before the Senate Committee on Foreign Relations, senior Administration spokesmen made statements to the effect that while the treaty would not prevent tests having effects noticed solely within the United States, it would prohibit a test which resulted in the delivery of debris outside the country's territorial limits in amounts sufficient to establish that such contamination resulted from a recent test within that country; that until the treaty was amended it would not be possible to carry out those nuclear excavation experiments from which detectable amounts of radioactive debris would be found and be detected outside of the territorial limits of the country where the experiments were performed, though there would appear to be no problem if the debris did not move outside of the United States or was so slight as to be beyond the capability of national detection systems; and that guides were being developed for those responsible for carrying out nuclear explosions to assure that detectable and identifiable amounts of radioactive debris did not leave our territorial limits. The related problem of accidental venting was also discussed. (Hearings: pages 24-26, 206 and 240).

3. On September 11, 1963, Senator Dodd introduced a proposed "Understanding" providing that ratification of the treaty was "subject to the understanding, which is hereby made a part of the resolution of ratification, that the words of Article I, subsection b 'in any other environment if such explosion causes radioactive debris to be present outside the territorial limits of the state under whose jurisdiction or control such explosion is conducted' shall be construed as referring to any significant quantity of radioactive debris rather than any measurable quantity ***." (Emphasis added).

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-5-

As indicated in Senator Dodd's speech on the Senate floor on September 23, 1963, this proposal was designed to remedy what he considered to be one of the defects of the treaty--namely that "it prohibits the kind of testing necessary to develop the peaceful uses of atomic energy." But he withdrew the proposed understanding and voted for the treaty as it stood, saying that: "After weeks of balancing the virtues, defects and limitations of the treaty against each other, against the needs of our national defense and against the hopes and fears of mankind, I have decided to vote for the treaty. I believe that the good in it outweighs the bad." (Cong. Rec., p. 16795).

It should be recognized that arguments such as the foregoing would be available to a party which wished to maintain that U.S. detonations permitted by the suggested standard violated the treaty.

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INCOMING TELEGRAM, Department of State

30-39

Action

~~SECRET~~

58

DECLASSIFIED

Authority E.O. 11652 SEC. 5(A) and (D)
By ip NARS, Date 2-8-80DAC
InfoCONTROL: 21100
RECD: MARCH 27, 1964 12:00 P.M.

SS

FROM: MOSCOW

G

SP

ACTION: SECSTATE 3004

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INFO: GENEVA 40

003

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DATE: MARCH 27, 5PM

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CPTL TO GENEVA 1345; EMBTEL 2908

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ISSUE NO. 3 MONTHLY PUBLICATION "SOVIET STATE AND LAW," JUST
RELEASED BUT SIGNED TO PRES FEB. 22, CARRIES ARTICLE BY I.G. USACHEV
PRESUMABLY MFA DISARMAMENT "EXPERT" "MOSCOW TREATY AND INTERNATIONAL
LAW" WHICH INDICATES SOVS HAVE BEEN PREPARED EXPLOIT ANY
RADIOACTIVE RELEASE, INCLUDING FROM UNDERGROUND TESTS, AS VIOLATION
INTERNATIONAL LAW.

IN COURSE GENERALLY FAMILIAR ATTACK, AUTHOR NOTES THAT ART. 1
OF TB TREATY OUTLAW NOT ONLY ATOMIC EXPLOSIONS IN THREE ENVIRONMENTS
BUT "ALSO EXPLOSIONS IN ANY OTHER ENVIROMENT (E.G. UNDERGROUND)
WHICH CAUSE "FALLOUT OF RADIOACTIVE CLOUDS BEYOND TERRITORITL
LIMITS OF STATE UNDER WHOSE JURISDICTION OR CONTROL EXPLOSION
OCCURRED." IN ANOTHER PASSAGE ARTICLE NOTES TREATY DOES NOT
PROVIDE SANCTIONS FOR ACTIONS WHICH CAUSE RADIOACTIVE POISONING
OF THREE ENVIRONMENTS, ADDING PARENTHETICALLY, "FOR EXAMPLE
UNDERGROUND TESTS WITH RELEASE OF MATTER."

} not like
some writing
which doesn't
mention
fallout -

AUTHOR ARGUES, HOWEVER, "MORAL POLITICAL CONDEMNATION", WHICH
WOULD BE ENCOURAGED, ITSELF CONSTITUTES "SERIOUS INTERNATIONAL
SANCTION".

MOREOVER, SUCH ACTIVITY MAY JEOPARDIZE VERY EXISTENCE OF A TREATY.

COMMENT: EFFORT MADE TO ATTACK ALL TESTS IN THREE ENVIRONMENTS AS
HEALTH MENACE AND TO DRAW QUALITATIVE DIFFERENCE BETWEEN TESTS
ON OWN TERRITORY AND THOSE CONDUCTED ON TRUST TERRITORIES OR HIGH

~~SECRET~~REPRODUCTION FROM THIS COPY IS
PROHIBITED UNLESS "UNCLASSIFIED"

T 214195

Card 30 Apr 64

~~SECRET~~

-2- 3004, MARCH 27, 5 PM, FROM MOSCOW

SEAS, LATTER BEING ALLEGEDLY ILLEGAL, INDICATE BROAD BRUSH EFFORT
TAR ALL PAST AND FUTURE TESTERS (INCLUDING CHINESE) WHILE MINIMIZING
SOV. ROLE. ARTICLE ALSO INDICATES, HOWEVER, SOV. LABELLING OF
ACCIDENTAL RELEASE RADIOACTIVITY IN RECENT NEVADA TEST AS POTENTIAL
VIOLATION TB TREATY WAS LESS AD HOC REACTION THAN IT ORIGINALLY
APPEARED (REFTEL). ALSO SUGGESTS AUTHOR NOT BRIEFED ON OR
DELIBERATELY IGNORED SOV PLANS FOR UNDERGROUND TESTS OR PERHAPS
JUST CONFIDENT ACCIDENT WITH UNDERGROUND TEST UNLIKELY TO OCCUR,
OR TO BE DETECTED. WHILE OBVIOUSLY DIFFICULT FOR AMERICAN POT
TO BLACKEN SOVIET KETTLE, SOME MILEAGE MIGHT BE MADE BY CONTRASTING
FRANK US ADMISSION WITH SOV SECRECY--SHOULD RADIOACTIVITY BE
DETECTED IN PAST OR FUTURE SOV UNDERGROUND TESTS.

GP-4.

CFN 40 1345 2908 3 22 4
STOESSEL

~~SECRET~~

~~SECRET~~

3042

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D. C.

This document consists of 2 pages
No. 1 of 2 Copies, Series A

cc
6/8
E. Johnson
6a

OFFICE OF THE CHAIRMAN

June 5, 1964

Dear Mac:

We have reviewed with considerable interest the State Department report of May 16, 1964 regarding the Plowshare Program and the Limited Nuclear Weapon Test Ban Treaty. The Atomic Energy Commission fully supports the State Department recommendations and indeed has been in several ways already undertaking activities in developing international interest as recommended in the State Department report.

For example, in the area of exchange of information on an international basis and international cooperation we conducted a Plowshare Symposium on April 21-23 which was attended by twenty-one foreign nationals, representing nine different nations. This symposium contributed to international understanding and interest for the Plowshare Program. In addition, we plan to have a Plowshare exhibit and film and present a paper on the Plowshare Program at the forthcoming International Scientific Conference at Geneva this fall. We will continue such activities as a part of our program.

In the area of field experiments we have, as you know, plans for conducting a row charge cratering experiment with chemical explosives in June of this year. This experiment is important from a technical point of view since no row charge experiment, either chemical or nuclear, has been conducted in hard, dry rock. We had planned and still expect to have domestic observers witness this experiment and anticipate that it will be widely reported by the news media. Unfortunately, time does not permit expanding the observer program so that meaningful international observation can be adequately planned for. We do expect, however, that the widespread domestic reporting will come to the attention of other nations and stimulate some interest in nuclear excavation.

DECLASSIFIED
Authority: AEC 015-3-1-7-7
BY: SDV
DATE: 11-15-77

GROUP 1
Excluded from automatic
downgrading and
declassification

This material contains information concerning the national defense of the United States within the meaning of the espionage laws, Title 18, U.S.C., Secs. 793 and 794, the transmission or revelation of which in any manner to an unauthorized person is prohibited by law.

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~~SECRET~~

-2-

The next step in our experimental program would be Sulky. The Sulky experiment, as you know, is proposed at the Nevada Test Site and would provide information on cratering technology and, more importantly, would provide critically needed data on the entrapment underground of radioactive debris and the dispersion of the small amount of radioactivity which escapes from the crater. If there is to be participation by international observers, an early decision to proceed with Sulky would be required. We propose to develop an adequate public information and international observation program to be undertaken as a part of the Sulky experiment. Even though the Sulky experiment would involve only a low yield, 100-ton explosive, we believe that the close-in, first-hand observation of a nuclear cratering experiment by international observers would go far toward allaying the fears of other nations with respect to radioactivity, and would do much to foster an interest in nuclear excavation. We would plan to provide detailed briefings before and after the detonation to both domestic and international observers.

Depending upon the data from Sulky and the status of clean device development, including debris entrapment, we will then be able to plan the next step in the nuclear excavation program in a manner consistent with the Limited Nuclear Weapon Test Ban Treaty and the recommendations of the State Department report.

Sincerely,



Glenn T. Seaborg

Honorable McGeorge Bundy
Special Assistant to the President
for National Security Affairs
The White House

~~SECRET~~

THE WHITE HOUSE
WASHINGTON

File 282

66

February 11, 1964

~~SECRET~~

NATIONAL SECURITY ACTION MEMORANDUM NO. 282

MEMORANDUM FOR: ✓ The Secretary of State
✓ The Chairman, Atomic Energy Commission -

SUBJECT: Project SULKY

In view of the delicacy of the balance of US-USSR relationship in other major areas plus the tight schedule for conducting SULKY at this time, the President has decided to defer further consideration of SULKY without prejudice until next winter, in the expectation that the intervening time could be profitably used for a review of possibilities for improving nondetection and to give a longer period in which to select the most favorable wind and weather conditions.

In addition, the President requests the Secretary of State, in consultation with other responsible officers of the Government as appropriate, to give immediate consideration to the probabilities and problems involved in obtaining from the nations signatory to the Test Ban Treaty approval for the utilization of nuclear energy for peaceful explosions under adequate international controls. The President requests that a first report on this matter be available to him by the end of March.

McGeorge Bundy

McGeorge Bundy

Copies to:

The Secretary of Defense -
Director, Bureau of the Budget -
Director, ACDA -
Director of Central Intelligence -
Special Assistant to the President -
on Science and Technology
Director, USIA

~~SECRET~~

DECLASSIFIED

Authority NSC Memo F-3195

By *ry* NARA, Date 12-3-99

cc:

Mr. Bundy
Mr. Johnson ✓
NSC Files
Mr. Keeny, OST
Mr. Schuldt, BOI

219922 2/12/64

~~2-18~~

THE WHITE HOUSE
WASHINGTON

~~6c~~

1. C Johnson

2. Kim



THE JOINT STAFF

~~CONFIDENTIAL~~THE JOINT CHIEFS OF STAFF
WASHINGTON 25, D.C.

J-5 (PLANS AND POLICY) DIRECTORATE

6d

26 June 1964

MEMORANDUM FOR MR. McGEORGE BUNDY

Subject: International Approval of Nuclear
Explosions for Peaceful Applications (U)

1. In response to your memorandum of 23 June 1964 on the above subject, the report prepared by the Department of State in response to NSAM No. 282 has been reviewed. The recommendations contained in that report are considered sound. However, it would appear that consideration of timing for implementation or review of actions recommended should be discussed by the Review Committee.

2. It would appear appropriate for the Review Committee to be prepared to discuss the consideration raised by the Atomic Energy Commission relative to the Treaty limitation on causing radioactive debris "to be present" beyond territorial boundaries and the Treaty's lack of precise technical criteria to determine "present." The acceptance of earlier international agreements or publications on radiation health standards as the technical definition of when radionuclides are "not present" possibly could provide an acceptable and workable standard in interpreting compliance with the Treaty limitation.

DECLASSIFIED

Authority

Group 4

By

NARA, Date

2/4/92

HARRY L. EVANS

Brigadier General, USAF

Alternate Representative of
the Chairman, JCS, to the
Review Committee on Underground
Nuclear Tests~~CONFIDENTIAL~~

GROUP - 4

Downgraded at 5 year
intervals; declassified
after 12 years

~~SECRET~~

3784

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D. C.

62

1. C Johnson
2. [Signature]

OFFICE OF THE CHAIRMAN

July 15, 1964

Dear Mac:

I am enclosing an updated analysis of Project Sulky which might be of use at the 11:00 AM meeting tomorrow of the Review Committee on Underground Nuclear Tests.

I am sending a copy of the analysis to each of the members of the committee.

Sincerely,



Glenn T. Seaborg

Honorable McGeorge Bundy
Special Assistant to the President
for National Security Affairs
The White House

Enclosure:
Analysis of Project Sulky

Upon removal of attachments
this document becomes
Unclassified

DOCUMENT TRANSMITTED
HEREWITH CONTAINS
~~RESTRICTED DATA~~

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69
—
NSAM 282

June 23, 1964

**MEMORANDUM FOR THE MEMBERS OF THE REVIEW
COMMITTEE ON UNDERGROUND NUCLEAR TESTS**

**SUBJECT: International Approval of Nuclear Explosions for
Peaceful Applications**

The report prepared by the State Department in response to NSAM No. 282 had been referred to the members of the Review Committee. It would be appreciated if the members of the Review Committee would send me by June 26, 1964, comments and specific suggestions for follow-on action in preparation for a meeting of the Review Committee in early July.

McGeorge Bundy

Chas. Johnson distributing 6/23

NATIONAL SECURITY COUNCIL


6h

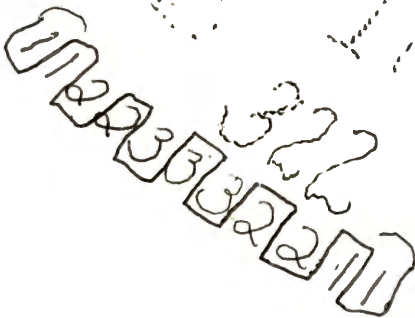
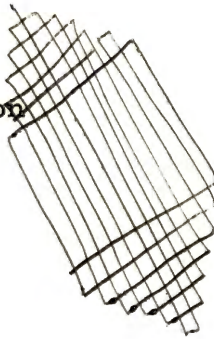
June 18, 1964

MEMORANDUM FOR MR. BUNDY

Mac --

The State Department sent copies of the report to all members of the Review Committee about a week ago. There has been a considerable amount of discussion at the staff level within AEC, State and Defense, and I think we are now in a position to move on the next phase of our consideration of the problem. AEC is now preparing a piece of paper in anticipation of a request from you and Defense will likewise have something in writing. It is my thought that when we get these additional pieces we can prepare a draft NSAM containing some specific Presidential guidance for consideration by the Review Committee at a meeting early in July.


C. E. Johnson





~~SECRET~~

DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING
WASHINGTON 25, D. C.

Log No. 64-2771

Copy No. 1

3570

62

DECLASSIFIED

Authority DOD Dir 5200.10
By [Signature], NARA, Date 2/4/92

John 282

C. Johnson

JUN 26 1964

2. [Signature]

MEMORANDUM FOR MR. McGEORGE BUNDY
SPECIAL ASSISTANT TO THE PRESIDENT FOR NATIONAL
SECURITY AFFAIRS

SUBJECT: International Approval of Nuclear Explosions for
Peaceful Applications

With reference to your memorandum of June 23, 1964, I feel the conclusions of the State Department memo in response to NSAM No. 282 are generally sound except for the suggestion that we invite international cooperation on the initial PLOWSHARE type of experiments. We need more data on debris movement, distribution and intensity, such as could be obtained from the SULKY test and possibly the two Department of Defense cratering experiments, before observers are invited to participate. If these tests were advertised in advance the chances of detecting debris beyond our border would be greatly enhanced.

If design of PLOWSHARE shots is open to foreign observers, construction of the special clean devices would have to be disclosed, which would reveal sensitive Restricted Data; and if conventional devices were used, the chances of violating the treaty would be much greater.

Practically all of the testimony and other comments on the effects of the treaty on PLOWSHARE-type of tests seem irrelevant in view of the acceptance of the treaty by the Senate without modification or clarification of the original wording. It is true that we can develop special clean devices in our present and future underground test series, but actual excavation tests using these explosives will be needed before we can be reasonably sure all detectable radioactive debris can be confined within the borders of the U.S.

Recommendation:

That the proposed SULKY test, or a more conservative modification of it, be carried out before there is any public announcement of the event, either in this country or abroad. The results of that event and possibly those of the two DoD cratering events should be assessed before any action is taken to negotiate changes in, or exceptions to, the treaty.

Harold Brown
Harold Brown

DOWNGRADED AT 3 YEAR INTERVALS;
DECLASSIFIED AFTER 12 YEARS.
DOD DIR 5200.10

~~SECRET~~

1938



~~SECRET~~
UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D.C.

JUN 26 1964

6/29
[Signature]
[Signature]

Dear Mac:

In accordance with the request in your memorandum of June 23, 1964, I am sending the enclosed copies of "AEC Comments on and Suggestions for Implementation of the Department of State Report on Nuclear Excavation" which constitutes the Atomic Energy Commission's comments on the Department of State report.

*Filed
Room
252*

Sincerely,

(Signed) Glenn T. Seaborg

Chairman

Enclosure:
Cy/B+2/Bof
S-RD report

Honorable McGeorge Bundy
Special Assistant to the President
for National Security Affairs
The White House

When separated from enclosures, handle this document

as

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UNCLASSIFIED
(insert proper classification)

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DOCUMENT TRANSMITTED
HEREWITH CONTAINS
~~RESTRICTED DATA~~

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3042

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D. C.

This document consists of 2 pages
No. 1 of 2 Copies, Series A

7a

OFFICE OF THE CHAIRMAN

June 5, 1964

Dear Mac:

We have reviewed with considerable interest the State Department report of May 16, 1964 regarding the Plowshare Program and the Limited Nuclear Weapon Test Ban Treaty. The Atomic Energy Commission fully supports the State Department recommendations and indeed has been in several ways already undertaking activities in developing international interest as recommended in the State Department report.

For example, in the area of exchange of information on an international basis and international cooperation we conducted a Plowshare Symposium on April 21-23 which was attended by twenty-one foreign nationals, representing nine different nations. This symposium contributed to international understanding and interest for the Plowshare Program. In addition, we plan to have a Plowshare exhibit and film and present a paper on the Plowshare Program at the forthcoming International Scientific Conference at Geneva this fall. We will continue such activities as a part of our program.

In the area of field experiments we have, as you know, plans for conducting a row charge cratering experiment with chemical explosives in June of this year. This experiment is important from a technical point of view since no row charge experiment, either chemical or nuclear, has been conducted in hard, dry rock. We had planned and still expect to have domestic observers witness this experiment and anticipate that it will be widely reported by the news media. Unfortunately, time does not permit expanding the observer program so that meaningful international observation can be adequately planned for. We do expect, however, that the widespread domestic reporting will come to the attention of other nations and stimulate some interest in nuclear excavation.

This material contains information concerning the national defense of the United States within the meaning of the espionage laws, Title 18, U.S.C., Secs. 793 and 794, the transmission or revelation of which in any manner to an unauthorized person is prohibited by law.

GROUP 1
Excluded from automatic
downgrading and
declassification

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1872

DECLASSIFIED
Authority: AEC 015-3-1-7-7
B1, 596, ARA Dec 11/15/17

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-2-

The next step in our experimental program would be Sulky. The Sulky experiment, as you know, is proposed at the Nevada Test Site and would provide information on cratering technology and, more importantly, would provide critically needed data on the entrapment underground of radioactive debris and the dispersion of the small amount of radioactivity which escapes from the crater. If there is to be participation by international observers, an early decision to proceed with Sulky would be required. We propose to develop an adequate public information and international observation program to be undertaken as a part of the Sulky experiment. Even though the Sulky experiment would involve only a low yield, 100-ton explosive, we believe that the close-in, first-hand observation of a nuclear cratering experiment by international observers would go far toward allaying the fears of other nations with respect to radioactivity, and would do much to foster an interest in nuclear excavation. We would plan to provide detailed briefings before and after the detonation to both domestic and international observers.

Depending upon the data from Sulky and the status of clean device development, including debris entrapment, we will then be able to plan the next step in the nuclear excavation program in a manner consistent with the Limited Nuclear Weapon Test Ban Treaty and the recommendations of the State Department report.

Sincerely,



Glenn T. Seaborg

Honorable McGeorge Bundy
Special Assistant to the President
for National Security Affairs
The White House

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8

THE WHITE HOUSE
WASHINGTON

June 23, 1964

MEMORANDUM FOR THE MEMBERS OF THE REVIEW
COMMITTEE ON UNDERGROUND NUCLEAR TESTS

SUBJECT: International Approval of Nuclear Explosions for
Peaceful Applications

The report prepared by the State Department in response to NSAM No. 282 had been referred to the members of the Review Committee. It would be appreciated if the members of the Review Committee would send me by June 26, 1964, comments and specific suggestions for follow-on action in preparation for a meeting of the Review Committee in early July.


McGeorge Bundy

8a

Memo for More Review Comte on
Underground Nuclear Tests
from the Buntysse Approval
of Nuclear Explosions for
Peaceful Applications

Copy of the memo ^{sent} ~~should go~~
to:

Dana Orwick - State

Harold Brown - Defense
W. J. Howard - Defense

Glenn Seaborg - AEC
General Crowson - AEC

Director McCone - CIA
Dr. Chamberlain - CIA

General Sackton - JCS

Dr. Hornig - OST
Spurgeon Keeny - OST

Adrian Fisher - ACDA
Dr. Scoville - ACDA

Kermit Gordon - Budget
Fred Schuldt - Budget

dispatched
6-24-64



DEPARTMENT OF STATE
WASHINGTON

NSAM 282
✓ Mr. Bundy
FYI 9
cf
April 10, 1964

~~SECRET~~

MEMORANDUM FOR MR. CHARLES JOHNSON
THE WHITE HOUSE

SUBJECT: Test Ban Treaty Restraints on the
Plowshare Nuclear Excavation Program

This will confirm our telephone conversation of
yesterday.

The senior officers in the Department, and
Governor Harriman in particular, believe that the
Secretary should personally review the report
requested by NSAM 282. The Secretary was not able
to give his attention to the proposed report prior
to his departure for the Far East. It will therefore
not be possible to review it with him until his return
on the 18th of April. In the interim, we are messaging
Adrian Fisher in Geneva to obtain his comments in the
light of his personal recollections as a member of the
Moscow negotiating team. Also ACDA staff are preparing
a more detailed record of the negotiating, legislative,
and public history on this subject.

Dana Orwick

DECLASSIFIED
E.O. 12958, Sec. 3.5
State Dept. Guidelines
By 18, NARA, Date 12-3-99

~~SECRET~~

Downgraded at 12 year intervals;
not automatically declassified.

1695

✓

18

THE WHITE HOUSE
WASHINGTON

February 11, 1964

~~SECRET~~

NATIONAL SECURITY ACTION MEMORANDUM NO. 282

MEMORANDUM FOR: The Secretary of State
The Chairman, Atomic Energy Commission

SUBJECT: Project SULKY

In view of the delicacy of the balance of US-USSR relationship in other major areas plus the tight schedule for conducting SULKY at this time, the President has decided to defer further consideration of SULKY without prejudice until next winter in the expectation that the intervening time could be profitably used for a review of possibilities for improving nondetection and to give a longer period in which to select the most favorable wind and weather conditions.

In addition, the President requests the Secretary of State, in consultation with other responsible officers of the Government as appropriate, to give immediate consideration to the probabilities and problems involved in obtaining from the nations signatory to the Test Ban Treaty approval for the utilization of nuclear energy for peaceful explosions under adequate international controls. The President requests that a first report on this matter be available to him by the end of March.

McGeorge Bundy

McGeorge Bundy

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Authority NSC Memo 8-31-95
By *y* NARA, Date 12-3-95

EXTRA COPIES

11a

February 11, 1964

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NATIONAL SECURITY ACTION MEMORANDUM NO. 282

MEMORANDUM FOR: The Secretary of State
The Chairman, Atomic Energy Commission

SUBJECT: Project SULKY

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McGeorge Bundy

SECRET

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Authority NSC memo 8-31-95
By ry NARA, Date 12-3-99

February 11, 1964

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NATIONAL SECURITY ACTION MEMORANDUM NO. 282

MEMORANDUM FOR: The Secretary of State
The Chairman, Atomic Energy Commission

SUBJECT: Project SULKY

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McGeorge Bundy

~~SECRET~~

DECLASSIFIED
Authority NSC Memo 8-31-95
By 24 NARA, Date 12-8-95

✓ 12
February 11, 1964

MEMORANDUM FOR MR. BUNDY

Mac --

Further apropos of the draft SULKY NSAM --

(1) Keeny and I both prefer a short form -- the last two paragraphs -- as a final text. I included the explanatory paragraphs for your use in talking to the President.

(2) Dana Orwick mentioned to Rusk last night that "the Bundy staff" supported the idea set forth in the draft NSAM. Rusk's personal view is completely parallel with ours.


Charles E. Johnson

THE WHITE HOUSE
WASHINGTON

February 11, 1964

~~SECRET~~

NATIONAL SECURITY ACTION MEMORANDUM NO. 282

MEMORANDUM FOR: The Secretary of State
The Chairman, Atomic Energy Commission

SUBJECT: Project SULKY

In view of the delicacy of the balance of US-USSR relationship in other major areas plus the tight schedule for conducting SULKY at this time, the President has decided to defer further consideration of SULKY without prejudice until next winter in the expectation that the intervening time could be profitably used for a review of possibilities for improving nondetection and to give a longer period in which to select the most favorable wind and weather conditions.

In addition, the President requests the Secretary of State, in consultation with other responsible officers of the Government as appropriate, to give immediate consideration to the probabilities and problems involved in obtaining from the nations signatory to the Test Ban Treaty approval for the utilization of nuclear energy for peaceful explosions under adequate international controls. The President requests that a first report on this matter be available to him by the end of March.

McGeorge Bundy

McGeorge Bundy

cc:

Mr. Bundy
Mr. Johnson
NSC Files

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Authority NSC memo 8-3195
By ly NARA, Date 12-3-95~~SECRET~~

Dispatched 2/11/64