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REPORT BY THE AD HOC COMMITTEE

consisting of:

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- Brig. General J.K. Rice, USA
- Rear Admiral T.B. Hill, USN
- Colonel H. McK. Roper, USA
- Colonel W.L. Kennedy, USAF
- Captain G.W. Anderson, Jr., USN

to the

JOINT CHIEFS OF STAFF

on:

EVALUATION OF EFFECT ON SOVIET WAR EFFORT RESULTING
FROM THE STRATEGIC AIR OFFENSIVE

- References:
- a. J.C.S. 1844/32
 - b. J.C.S. 1903/3
 - c. J.C.S. 1952 Series
 - d. J.C.S. 1953
 - e. J.C.S. 1974

THE PROBLEM

1. To evaluate the effect on the war effort of the U.S.S.R. of the Strategic Air Offensive contemplated in current war plans, including an appraisal of the psychological effects of atomic bombing on the Soviet will to wage war (Enclosure to J.C.S. 1953).

FACTS BEARING ON THE PROBLEM

2. General. TROJAN (J.C.S. 1844/32) is the currently effective war plan being used by the United States for planning purposes.

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3. Specific. The plan for the strategic air offensive in support of TROJAN contemplates two distinct phases:

a. An initial phase, consisting of a series of attacks primarily with atomic bombs on 70 target areas (presently planned by the Strategic Air Command to be accomplished in approximately 30 days).

b. A second phase, consisting of a continuation of the initial attacks with both atomic and conventional weapons.

ASSUMPTIONS

4. This evaluation is based upon the initial phase of the air offensive hereafter referred to in this report as "the initial atomic offensive".

5. a. The conduct of the initial atomic offensive as planned by the Strategic Air Command will result in placing "on target" the full number of bombs specified in J.C.S. 1974.

(The chances of success of delivery of this atomic offensive are specifically exempt from this problem (J.C.S. 1952 series.))*

b. Bombing accuracy as represented in a [redacted] circular error probability [redacted] will obtain.

6. a. Evaluation of intelligence is a responsibility of the Joint Intelligence Committee.

DISCUSSION

7. See Enclosure "E".

* Underlined for emphasis

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CONCLUSIONS

8. It is concluded that complete and successful execution of the initial atomic offensive against the U.S.S.R., as planned, would probably affect the war effort, and produce psychological effects upon the Soviet will to wage war as set forth below. Should it be planned or concluded in related studies that a lesser or greater number of atomic bombs would actually be delivered on targets, that different basic conditions would prevail, or that intelligence as to the level and distribution of Soviet industry has changed substantially, a re-evaluation would be necessary.

EFFECT ON INDUSTRIAL CAPACITY

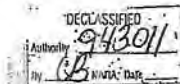
9. Physical damage to installations, personnel casualties concentrated in industrial communities, and other direct or indirect cumulative effects would result in a 30 to 40 percent reduction of Soviet industrial capacity. This loss would not be permanent and could either be alleviated by Soviet recuperative action or augmented depending upon the weight and effectiveness of follow-up attacks.

10. Of outstanding importance is the prospect that the petroleum industry in the U.S.S.R. would suffer severe damage especially in refining capacity. The supply of high test aviation gasoline would become rapidly critical.

PERSONNEL CASUALTIES

11. The initial atomic offensive could produce as many as 2,700,000 mortalities, and 4,000,000 additional casualties, depending upon the effectiveness of Soviet passive defense measures. A large number of homes would be destroyed and the problems of living for the remainder of the 28,000,000 people in the 70 target cities would be vastly complicated.

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PSYCHOLOGICAL EFFECTS

12. The atomic offensive would not, per se, bring about capitulation, destroy the roots of Communism or critically weaken the power of Soviet leadership to dominate the people.

13. For the majority of Soviet people, atomic bombing would validate Soviet propaganda against foreign powers, stimulate resentment against the United States, unify these people and increase their will to fight. Among an indeterminate minority, atomic bombing might stimulate dissidence and the hope of relief from oppression. Unless and until vastly more favorable opportunities develop for them, the influence of these elements will not appreciably affect the Soviet war effort.

14. A psychological crisis will be created within the U.S.S.R. which could be turned to advantage by the Allies through early and effective exploitation by armed forces and psychological warfare. Failing prompt and effective exploitation, the opportunity would be lost and subsequent Soviet psychological reactions would adversely affect the accomplishment of Allied objectives.

EFFECTS ON THE SOVIET ARMED FORCES

15. The capability of Soviet armed forces to advance rapidly into selected areas of Western Europe, the Middle East and Far East, would not be seriously impaired, but capabilities thereafter would progressively diminish due to the following factors:

a. The supply of petroleum products of all types will rapidly become critical to all branches of Soviet armed forces, resulting in:

(1) Greatly reducing the mobility of the Army.

(2) Reducing the scale of operations by the Soviet Navy and merchant shipping, although submarine warfare would probably be unaffected.

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(3) Seriously reducing air operations involving training, transport, support of ground and naval forces, and independent offensive action, although proper allocation of fuel would allow continued operations by air defense forces.

NOTE: The point at which capabilities of Soviet armed forces would diminish to a critical degree would depend upon many variable or unpredictable factors most important of which is the level of stockpiles prevailing at the initiation of hostilities.

b. After consumption of initial stocks of basic equipment and consumable supplies, progressive shortages of a wide variety of items, particularly aircraft, would handicap operations and affect morale of the armed forces.

c. Logistic support would be handicapped due to disruption of planning, impairment of controls, damage to industry and interference with transportation.

16. The Soviet High Command would be forced quickly to re-estimate their strategic position and make important decisions regarding operational plans under difficult circumstances. They would probably limit, postpone, or abandon certain campaigns, but it is impossible to predict what specific decisions would be made.

17. Atomic bombing would open the field and set the pattern for all adversaries to use any weapons of mass destruction and result in maximum retaliatory measures within Soviet capabilities.

GENERAL

18. Atomic bombing will produce certain psychological and retaliatory reactions detrimental to the achievement of Allied war objectives and its destructive effects will complicate

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post-hostilities problems. However, the atomic bomb would be a major element of Allied military strength in any war with the U.S.S.R., and would constitute the only means of rapidly inflicting shock and serious damage to vital elements of the Soviet war-making capacity. In particular, an early atomic offensive will facilitate greatly the application of other Allied military power with prospect of greatly lowered casualties. Full exploitation of the advantages to be obtained is dependent upon the adequacy and promptness of associated military and psychological operations. From the standpoint of our national security, the advantages of its early use would be transcending. Every reasonable effort should be devoted to providing the means to be prepared for prompt and effective delivery of the maximum numbers of atomic bombs to appropriate target systems.

RECOMMENDATIONS

19. It is recommended that the Joint Chiefs of Staff:
- a. Approve the foregoing conclusions.
 - b. Forward the memorandum in Enclosure "A" to the Secretary of Defense.

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~~Two brown folders concerning industries of the 40 cities filed in B P this case.~~ PICKED UP BY AIR FORCE INTELLIGENCE PERMANENTLY

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12 May 1949

FOUR COPIES OF A BLUE BOOK (COPIES 1-4) CONTAINING AREA OF THE 100 LARGEST... POPULATION OF THE 167 LARGEST CITIES IN THE USSR PREPARED BY ARMY INTEL DIV, FILED IN BULKY PKG.

Large folder containing maps of the 100 cities, filed in photostat cabinet in vault.

B.P. J.C.S. file

MAY 13 1949



RECORDS SECTION
FIVE FIGHT JAMES AT STAR

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 EFFORT RESULTING FROM THE STRATEGIC AIR OFFENSIVE"

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ENCLOSURE "A"

D R A F T

MEMORANDUM TO THE SECRETARY OF DEFENSE

In accordance with the request of the Secretary of Defense, dated 25 October 1948, the Joint Chiefs of Staff have had a joint evaluation made of the effect on the Soviet war effort of the initial atomic offensive contemplated in current war plans. This evaluation includes an appraisal of the effect of atomic bombing on the Soviet will to wage war. The Joint Chiefs of Staff concur in general with the conclusions as stated by the Ad Hoc Committee in paragraphs 8 through 18 of the attached report.

With respect to paragraph 9 of these conclusions, the target systems for the initial atomic offensive have been carefully selected to insure that certain vital industrial elements receive maximum damage. The 30 to 40 per cent reduction cited is a valid measure of damage to over-all Soviet industrial capacity. However, certain target systems selected for attack, such as the petroleum industry, would receive appreciably greater damage. Furthermore, this magnitude of the destruction and the brief time span in which it occurs should retard Soviet recuperative action to an indeterminate but considerable extent.

As for the "Psychological Effects" referred to in paragraphs 12, 13, and 14, the Joint Chiefs of Staff feel that such reactions are not susceptible to a firm evaluation. These conclusions, while probably the best estimate generated to date, should be regarded as informed opinions on an admittedly abstruse and controversial matter.

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With reference to paragraph 17, the Joint Chiefs of Staff feel that this conclusion has validity; however, they consider that such mass destruction weapons as are available to the USSR would be used to achieve their objectives regardless of any action on our part.

With reference to the first sentence of paragraph 18, the Joint Chiefs of Staff desire to point out that all means of warfare involve destruction in varying degrees, and that the objective during wartime of all armed forces is the destruction of some part or another of the enemy's resources. These conclusions, therefore, while applicable to atomic bombing, are also, to some degree, applicable to all forms of warfare.

It is to be noted that the attached evaluation has been predicated upon successful delivery of the initial atomic offensive. The chances of success of delivery of the air offensive are being examined separately. Upon completion of that study, it is the intention of the Joint Chiefs of Staff to re-evaluate these conclusions in the light of estimates as to the percentage of bombs considered most likely to be delivered to selected targets.

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ENCLOSURE "B"

DISCUSSION

1. U.S. Plans. The Joint Outline War Plan "TROJAN" has been accepted by the Joint Chiefs of Staff for planning purposes to provide a basis for developing the initial operations of U.S. and Allied forces in the event that war has been forced upon the United States by acts of aggression by the U.S.S.R. and/or her satellites during the fiscal year 1949. The over-all strategic concept of that plan provides, among other operations ". . . Initially to launch a powerful air offensive designed to exploit the destructive and psychological power of atomic weapons against the vital elements of the Soviet war-making capacity; . . ." An Annex to this plan and supporting plans of the Strategic Air Command, U.S. Air Force, provide for launching an initial atomic offensive from available bases against selected targets in seventy urban areas of the U.S.S.R. as soon as practicable. It is planned to follow up the initial atomic attacks with continuing air offensives utilizing conventional bombs and mines in addition to atomic weapons. Pertinent details of the foregoing plans are set forth in Appendix "A" to this Enclosure.

2. Basis for Evaluation. In order to evaluate the effect of the initial atomic offensive on the U.S.S.R., it is first necessary to establish an acceptable basis upon which results can be measured. The problem may be divided into three parts:

- (a) An evaluation of material damage and personnel casualties;
- (b) An appraisal of psychological effects;
- (c) The application of the foregoing to the military capabilities of the U.S.S.R. in the light of conflicting war objectives of the U.S. and the U.S.S.R.

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The first involves analysis and determination of expected material damage to industry, the prospective number and concentration of casualties, and among what categories of people these casualties will occur. From such examination, deductions can be made concerning the effects of all of this upon the provision of necessary equipment and consumable supplies to the armed forces and for a minimum civilian economy.

The second involves an appraisal of the psychological effect of the atomic bombing upon the government, the people and the armed forces--particularly with regard to the effects that it may have upon control, attitudes and will to fight or to support warfare.

The third involves consideration of the extent to which the atomic bombing will affect Soviet military capabilities and influence strategy in the light of estimated Soviet aims in opposition to Allied war objectives.

Underlying the examination is the prevailing recognition that the air offensive is but a part, albeit important, of the whole of military, psychological, political and economic operations that will be required to defeat the U.S.S.R. For details in respect to the Basis of Evaluation, see Appendix "B" to this Enclosure.

3. Method of Analysis

(a) In order to approach a solution to the problem it was necessary to examine critically broad and specific matters of intelligence regarding the U.S.S.R., estimates of Soviet capabilities and intentions, and U.S. plans, particularly those for the initial atomic offensive. Examination was made of the methods and data being used in the selection of targets and aiming points. While chances of success of delivery and evaluation of intelligence were specifically exempt from this study, it was necessary to consider pertinent matter principally for purposes of obtaining background information.

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Considerable time and effort were devoted to the acquisition of information regarding Soviet stockpiles, industrial establishments and public utilities. Target maps and objective data were examined to determine, insofar as practicable, the installations, together with their productive capacities, which would be liable to destruction and the probabilities of obtaining such destruction.

(b) In appraising the effect of bombing on the Soviet will to wage war, the Committee digested a great deal of written material on the historical development, characteristics, traits and reactions of the people of the U.S.S.R.; reviewed psychological studies and interviewed many individuals whose positions or experience qualified them to give evidence or to express opinions bearing on the problem. By appraising the substance and merit of the evidence, the Committee was able to express an "informed" opinion on an admittedly abstruse and controversial subject. For details of the method of analysis and sources consulted, see Appendix "C" to this Enclosure.

4. Intelligence. The Committee noted that the task of assessing the adequacy and validity of intelligence related to this problem is properly the responsibility of the Joint Intelligence Committee. However, the validity of any evaluation of the effects of the initial atomic offensive on the Soviet people and their war effort is, in large measure, dependent upon the supporting intelligence. Appendix "D" to this Enclosure contains comments on intelligence matters made solely for the purpose of describing the extent and detail to which it was possible to proceed in solving the problem, and the extent to which it is practicable at this time to derive valid conclusions.

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5. The Soviet Military Position

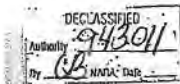
(a) The strategic intentions of the Soviet Union in the event of a war between Anglo-American powers and the U.S.S.R. in 1949 are estimated in ABAI 5 to include as early objectives: Seizure of the Middle East and its oil resources; destruction of all forces of the Allies on the Eurasian land mass; seizure or neutralization of those areas from which the Western Powers might swiftly and effectively strike at the U.S.S.R.; neutralization or seizure of the United Kingdom; expansion and consolidation of positions in China, Manchuria and Korea; disruption of allied war-making capacity by subversion and sabotage; disruption of vital allied lines of communication by aggressive submarine warfare, mining and air operations; and accomplishment of diversionary attacks in Allied-held territory for the purpose of causing maldeployment of Allied forces. Details of this estimate are set forth in ABAI 5 and significant phasing is summarized in Appendix "E" to this Enclosure.

An important qualification relative to the phasing of Soviet offensive operations is quoted from ABAI 5:

"Although the United States and the United Kingdom may employ weapons of mass destruction, the Joint Intelligence Committee have not been informed of the timing, scale, and effectiveness of possible Allied attacks using these weapons. In weighing Soviet capabilities it has been impossible, therefore, to assess the effect of the use of these weapons on the Soviet Union. However, it is emphasized that employment of them could be expected to affect the progress of Soviet campaigns."

The heaviest commitments and expenditures of military supplies--for Soviet ground forces would be from D to about D/90 and might then be markedly reduced provided the U.S.S.R. has by then overrun Western Europe, Italy (except Sicily), Scandinavia,

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Turkey (except the Alexandretta area), the Middle East (except for the Palestine, Jordan Valley and Suez areas), and the Far East. However, heavy drain on U.S.S.R. resources will continue even prior to the development of an Allied surface offensive for normal support of large ground forces on extended fronts, to meet combat requirements at points of contact and in internal areas to consolidate positions and cope with underground movements.

Continuing demands also will be placed on Soviet air and naval forces to cope with the increasing tempo of Allied attacks as well as for Soviet offensives by these services. In particular, air operations in the defense of the U.S.S.R., offensives against the United Kingdom or at long range against the United States and operations in support of ground forces will require continuing supply of petroleum products, replacement aircraft, engines and equipment, spare parts and munitions. Soviet submarine operations, while requiring relatively small quantities of fuel, will necessitate re-supply of torpedoes, engine parts and electronic equipment as well as new craft to sustain the tempo of widespread operations. Elaborate training programs will be required for all services with attendant demands on fuel and equipment. As fronts are extended, requirements for transportation both within and beyond borders of the U.S.S.R. will increase to a degree, depending upon the scope and tempo of operations.

(b) Stockpiles. Reliable information on the level and location of Soviet stockpiles of military supplies is limited. However, it has been estimated (ABAI 5 and CIA) that adequate supplies of tanks, guns, small arms, ammunition, vehicles and food would be on hand to support, in reasonable measure, the initial Soviet operations to accomplish their initial objectives. In basic equipment for ground forces no shortages are evident. It has been estimated that substantial quantities of aircraft are maintained in operational units and in storage. The available stockpile of petroleum products is considered

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short but not critical for early operations. Without air interdiction, the supplies are believed to be sufficient to meet anticipated requirements. Fuel is available for estimated essential naval operations, including those of submarines. See Annex "A" to Appendix "E".

6. Passive Defense Measures. The chances of success of delivery of the initial atomic offensive is beyond the scope of this study, therefore, it is inappropriate to consider herein the active* defense measures which the Soviet Union might adopt. On the other hand, there is a broad field of passive* defense measures which can be adopted prior to and during hostilities to minimize the effects of air attack either by atomic or conventional weapons.

These measures are discussed in Appendix "F" to this Enclosure, significant conclusions of which are:

(a) Information is available to the U.S.S.R. as to passive defense measures which would reduce material damage and personnel casualties from atomic bombing and facilitate maintaining or regaining control of the population and in restoration of damage.

(b) The government of the U.S.S.R. is aware of the threat to them of atomic attack and trends are evident that steps are being taken within limitations of time and resources to reduce the impact on vital elements of their war-making capacity. Many passive defense measures could be implemented quickly.

* Underlined for emphasis

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(c) Underground construction has been provided in a number of cases for important command posts, communication centers and some emphasis has been placed on such construction for fortifications, supply depots, and critical industrial establishments. Aircraft hangers and command posts are known to exist underground at some of the important air force installations.

(d) Location of supply dumps and stockpiles, on which information is limited, follows a logical pattern for the support of the armed forces, consistent with transportation facilities available, and with evidence of dispersion to reduce vulnerability from all types of attack.

(e) Substantial accomplishment of measures specifically designed to minimize material damage or provide shelters for the urban population as a whole from atomic attack is not yet in evidence in the U.S.S.R.

7. Destructive Effect of Weapons. The damage to be expected from each of the types of weapons to be employed in the initial atomic offensive is set forth in detail in Appendix "G" to this Enclosure. This data was compiled from reports of the Atomic Energy Commission, of authoritative sources on the various atomic explosions that have taken place up to the present time, and the pertinent reports of the U.S. Strategic Bombing Survey. The estimated areas of given overpressures for each type of bomb and the overpressures required for Class "A" damage* to various types of structures is contained in the Restricted Data Annex to Appendix "G" to this Enclosure. Major casualties to personnel and collateral devastation by fire should, on the average, but varying as to local conditions, approximate the area of structural damage. Radiological effects are well within these areas. Significant is the fact that the atomic bomb is a weapon particularly effective against built-up, populated areas such as cities.

* That which renders a building or installation unsuitable for intended use until major reconstruction is accomplished.

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that if used against selected isolated targets of limited size, although it might be effective against the target itself, much of its destructive effect may be unused.

8. Target Selection and Determination of Aiming Points.

Responsibility for target analysis, determination of strategic vulnerability and recommendations in regard to aiming points on selected objectives is vested in the Air Intelligence Division of the Air Force. Details of the methods and principles involved are set forth in Appendix "H" to this Enclosure. The Committee determined, with the advice of a panel of mathematicians selected by the Chairman of the Research and Development Board, that the computations and methods are formally correct. The report of this panel is set forth in Appendix "H" to this Enclosure.

9. Determination of Material Damage and Personnel Casualties.

It was originally planned that the evaluation of effect of the initial atomic offensive on the Soviet war effort would be based fundamentally on an exact analysis of a significant portion of the facilities likely to be damaged by each bomb compared with available productive capacity in each industry and contrasted with stockpiles, expenditures and requirements. Investigation revealed that lack of up-to-date basic information on a sufficient number of vital industrial complexes and progress in target analysis on the bulk of installations in most of the Soviet cities which would be attacked, together with other unknown or variable factors, precluded a solution along such lines at this time. The following approaches were adopted as alternatives:

- (a) An examination of seven specially selected systems on which available information and analysis data indicated the feasibility of determining on them the effects of the initial atomic offensive. These systems are: Petroleum, steel, aircraft, synthetic rubber and inorganic chemicals, Machine tools,

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electric power and rail transportation (Annexes "A" through "G" to Appendix "I" to this Enclosure).

(b) The Committee decided that an estimate could be made of the percentage of "across the board" industrial capacity liable to be damaged and of the personnel casualties which might be inflicted, by determining the percentage of the total urban area of the U.S.S.R. (cities over 50,000) which would be destroyed or damaged. This is on the premise that, by and large, the industry of a nation is located in those areas where population is dense and built-up areas are prevalent.

Notable exceptions are oil refineries, electric power plants, and items of the transportation system. While it is realized that the margin of error might be large if applied against a small number of bombs directed at a few cities, it is considered that the variables should cancel out to reduce the margin of error to acceptable limits when the number of bombs and urban areas involved is large (Annex "H" to Appendix "I" to this Enclosure).

Throughout this section probabilities of damage to percentages of Soviet industry are expressed to a degree of precision which the Committee realizes is unrealistic in the light of the many unknowns and variable factors. However, they are the final results of accurate calculations which were prepared in an exact manner for this Committee and hence were not modified.

The estimated damage set down hereafter has been based on the probability of achieving damage on the entire installation in each target under consideration. In effect, it states that (discounting all operational losses and gross bombing errors) there is a 7 to 3 chance that the damage as stated can be achieved. The probability factor (70%) was derived from the assumed average error in bombing [] the distance of the target installation from the predicted explosion point of the bomb, and the estimated radius of damage from the bomb's blast

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wave. It should be emphasized here that the mathematics of this derivation are based upon the assumption that a large number of bombs will be dropped.

Since there is a large variation in the productive capacity of the various installations taken under attack, total damage to industrial production will necessarily vary widely on the basis of the performance of individual bombs. Although it may be possible to take account of this variation in the original allocation of bombs to targets, there does not appear to be any satisfactory method of assessing it after all bombs are assumed to have been expended.

Significant conclusions of these studies, extracted from Appendix "I" to this Enclosure are:

PETROLEUM:

1. Successful execution of the initial atomic offensive, as planned, would:
 - a. Result in a 90% or better probability of Class A damage to 76.4% of the total U.S.S.R. throughout refining capacity;
 - b. Result in a 70% or better probability of Class A damage to 100% of the U.S.S.R. high octane avgas refining capacity;
 - c. Result in a stringent reduction in the supply of petroleum products to the Soviet armed forces and in a corresponding reduction in over-all Soviet military capability;
 - d. Result in a critical shortage of high octane aviation gasoline, with a corresponding reduction in the combat effectiveness of the Soviet air force.

NOTE: The time at which shortages of petroleum products for the Soviet armed forces becomes critical will depend largely upon the levels of POL stockpiles prevailing at the initiation of hostilities and the efficiency with which the U.S.S.R. is able to exploit remaining refinery capacity, including that for synthetic fuels.



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2. The Soviet oil refining industry appears to constitute a most lucrative target and serious consideration should be given to making it the primary objective, with either atomic or conventional bombs, of the initial atomic offensive.

STEEL

1. The successful execution of the initial atomic offensive, as planned, has a 70% or better probability of reducing the productive capacity of raw steel in the Soviet Union by 45.5% or approximately 7-1/4 million tons per year, leaving a remaining capacity of about 10-3/4 million tons per year, pending restoration of damage or augmentation from other sources.

2. An indeterminate but substantial portion of Soviet steel processing facilities would be destroyed or damaged. This would adversely affect capabilities to restore damage both in the steel industry and other industries and would result in directly reducing the output of war materials.

3. Damage inflicted would be serious but the effect on the war effort would be primarily of a long-range nature in creating shortages of finished war materials. Given time much of the damaged producing and processing machinery can be salvaged, repaired or restored to operations.

4. Partial relief of steel shortages should be possible from satellite countries and conquered areas but time in excess of one year will be required to exploit substantially such sources.

SYNTHETIC RUBBER:

1. During the first year of war the Soviet war effort will not be critically affected by the damage to the synthetic rubber industry caused by the initial atomic offensive. Although there is a 70% or better probability of Class A damage to 57% of synthetic rubber capacity, the civilian economy should be able to absorb such shortages as may exist.

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2. During the second and succeeding years of war, shortages would become critical and would be reflected in decreased mobility of the Soviet armed forces and in the civilian economy, unless damaged facilities are restored or replaced by conversions.

AIRCRAFT AND AIRCRAFT ENGINES:

1. Successful execution of the atomic offensive as planned would result in a 70% or better probability of Class A damage to 59% of Soviet aircraft assembly capacity, and to 68.3% of aircraft engine capacity. In addition, indeterminate damage of a serious nature would be inflicted on sources for production of aviation equipment and accessories.

2. Damage to the two known plants producing long-range bombers would progressively reduce Soviet capability for long-range air bombardment. With the reduction in flow of replacement aircraft and engines to operational units and for training, the U.S.S.R. will be forced to reduce progressively air power for independent, cooperative, and supporting operations.

3. Coupled with the shortage of aviation gasoline, the reduced production of aircraft will force extreme selectivity in air operations and constitute a serious deficiency in Soviet military capabilities.

MACHINE TOOLS:

1. Neither the machine tool industry nor inventory stocks provide appropriate targets of themselves for inclusion as primary targets in the initial atomic offensive.

2. Successful execution of the initial atomic offensive, as planned, will:

a. Provide 70%, or better, probability of Class A damage to 23.9% of the plants of the machine-tool industry.

b. Effect considerable, but an indeterminate amount of destruction or damage to machine tools, either installed or stocked, incidental to the destruction of industrial plants to which they pertain.

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3. Damage to either the machine-tool industry or to machine-tool inventories of the U.S.S.R., from successful execution of the initial atomic offensive, would result in severe but not critical impact upon the Soviet war effort.

ELECTRIC POWER:

1. Successful execution of the initial atomic offensive, as planned, would:

a. Result in a 70% or better, probability of Class A damage to 1.2% of U.S.S.R. electric generating capacity, and cause considerable damage to local transformers, distribution installations and equipment throughout the 70 target areas;

RAIL TRANSPORTATION:

1. The rail transportation system has not been selected as a specific primary target in the initial atomic offensive, nor is it a suitable primary target for conventional attack with the forces likely to be initially available.

2. Direct damage inflicted on railroad lines and yards as a result of the initial atomic offensive against 70 urban areas will be limited in scope, and generally susceptible to rapid repair by manpower largely unskilled.

3. Indeterminate, but estimated to be considerable, damage will be inflicted on control facilities and rolling stock that may be located in marshalling and classification yards in areas under attack.

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4. Heavy damage will occur to the facilities for building, maintaining and repairing railroad equipment. This is bound to be serious, since this portion of Soviet industry is already functioning at maximum capacity.

DAMAGE BY STANDARD DEVIATION METHOD

In an effort to express a more definitive estimate of damage, this Committee calculated a reasonable estimate of damage to be expected by the statistical method known as the theory of standard deviations:

<u>REASONABLE EXPECTANCY OF SEVERE DAMAGE TO PRODUCTIVE CAPACITY OF SELECTED INDUSTRY</u> (See NOTE (a))	<u>PERCENTAGE OF INDUSTRY DAMAGED</u>
(1) Petroleum Refining	60-75
(2) High Test Aviation Gasoline	70-95
(3) Raw Steel	35-50
(4) Synthetic Rubber	50-60
(5) Assembled Aircraft	45-55
(6) Aircraft Engines	65-80
(7) Machine Tools	25-30
(8) Electric Power	Negligible

NOTE (a): The foregoing is predicated on a circular error probability of 1. Should the standard of bombing accuracy or the number of bombs actually reaching targets be different, a directly proportionate computation of the above percentages would not be correct. Complete recomputation based upon specific recalculation of each specific part of each selected industry would be necessary because both probability and percentage of damage would be affected.

A synthesis of these two methods of estimating damage was used to derive final conclusions for this report. It should be noted here that for reasons given above neither of the estimates of damage can be accepted as more than an index upon which to base considered judgment.

AREA BASIS:

1. Successful execution of the initial atomic offensive, as planned, would:

a. Result in damage to Soviet urban areas as indicated in the following table:



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Damage Depending Upon Type of Structure	Minimum Lbs/sq.in. Overpressure	Approximate Square Miles of Soviet Urban Areas Destroyed or Damaged	Approximate Percentage of Total Soviet Urban Areas (50,000 or Greater) Destroyed or Damaged
Destroyed to Heavy Damage	8	320	13
Destroyed to Medium Damage	6	460	19
Destroyed to Light Damage	5	650	27
Destroyed to Superficial Damage	4	840	35

b. Be liable to inflict Class A Damage on about 20 - 30 per cent of the Soviet industrial establishment as a whole.

c. Produce as many as 2,700,000 mortalities, 4,000,000 additional casualties, destroy a large number of homes, and vastly complicate the problems of living for the remainder of the 28,000,000 people in the 70 target cities depending on the effectiveness of Soviet passive defense measures.

d. Based upon the Soviet industry as it is known at the present time, the following table indicates the approximate damage of the initial atomic offensive likely to be inflicted for various percentages of the numbers of atomic bombs contemplated in TROJAN which might actually be delivered on targets. These percentages were derived from precise calculations rounded off in the light of the many variable and unknown factors.

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Percentage of "TROJAN" Bombs Actually Delivered to Targets	APPROXIMATE DAMAGE			
	25%	50%	75%	100%
A. SQUARE MILES OF SOVIET URBAN AREAS DESTROYED OR DAMAGED				
(1) Destroyed to Heavy Damage 8 #/sq.in. Overpressure	80	160	240	320
(2) Destroyed to Medium Damage 6 #/sq.in. Overpressure	115	230	345	460
(3) Destroyed to Light Damage 5 #/sq.in. Overpressure	165	325	490	650
(4) Destroyed to Superficial Damage 4 #/sq.in. Overpressure	210	420	630	840
B. CORRESPONDING PER CENT OF TOTAL URBAN AREAS DAMAGED AND PROBABLE EXTENT TO WHICH INDUSTRY AS A WHOLE IS AFFECTED				
(1) Destroyed to Heavy Damage	3	6	9	12
(2) Heavy to Medium Damage	5	10	15	20
(3) Heavy to Light Damage	7	13	20	26
(4) Heavy to Superficial Damage	9	18	27	35
C. CORRESPONDING PERSONNEL CASUALTIES (In Thousands)				
(1) Mortalities	750	1500	2250	3000
(2) Additional Personnel Casualties	1000	2000	3000	4000

CUMULATIVE EFFECTS

The wide distribution of damage on urban areas throughout the U.S.S.R. with associated shock, confusion, and casualties to personnel, as well as the rate at which damage and casualties are inflicted, will have an additional cumulative effect on industry essential to the Soviet war effort. Although aiming points are selected primarily to focus the damage on specific industries and industrial concentrations, it is inevitable that actual damage will be indiscriminate as to types and functions of other installations within the target areas. This will affect adversely all phases of Soviet economy and the ability of the Soviet people to carry on effectively with work necessary for the prosecution of a war.

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The amount and rate at which damage and personnel casualties are inflicted will also have adverse effects on recuperative measures which will need to be taken to restore order and production essential to the war effort. Immediately after each atomic explosion, the surviving population in the affected area will be posed many complicated problems such as simultaneously caring for casualties, extinguishing fires, restoring essential utilities, providing food and shelter, and clearing rubble. The people will be called upon to meet these problems immediately and at a time when shock and fear are prevalent, leadership is handicapped, many key personnel are killed or missing, and controls are disrupted. Each operation will place heavy demands on the available manpower and the effective accomplishment of each will be dependent upon the others. The destruction of large numbers of homes will impose lasting hardships on an urban population already overcrowded and existing on a marginal status.

All of the foregoing tasks will have to be faced before reconstruction of industrial facilities can be undertaken and production restored in whole or in part. In the reconstruction of facilities or the restoration of production, it is to be remembered that dependence must be placed on other industries and utilities, many of which may have been concomitantly damaged or are suffering from the collateral effects of damage elsewhere. The interdependency of all industries and services is a factor of importance in normal production, in the restoration of damage and in reestablishing production from previously damaged plants.

The damage, personnel casualties and effects therefrom have been estimated on the basic assumption that the initial atomic offensive contemplated in current war plans (TROJAN) is successfully executed as planned. This applies both to the quantity of bombs and the period in which they are delivered. Should a lesser number of bombs be actually delivered on targets, or the



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rate of delivery be substantially slower, the damage, casualties and effects would be less. Should a larger number of bombs be delivered on the targets, and the rate of delivery the same or greater, the damage, casualties and effects would also be greater. In either case, re-evaluation should be made.

SUMMARY

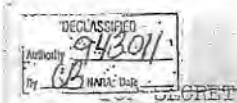
Physical damage to installations, personnel casualties concentrated in industrial concentrations, and other direct or indirect cumulative effects would result in a 30 to 40 per cent reduction of Soviet industrial capacity. This loss would not be permanent and could either be alleviated by Soviet recuperative action or augmented depending upon the weight and effectiveness of follow-up attacks.

10. Attacks on Atomic Energy Installations. At this time sufficient confirmed knowledge does not justify the assignment of any of the bombs reserved for Soviet atomic installations, nor does evidence indicate that any significant portion of installations identified with the Soviet atomic energy program will be destroyed by the bombs planned to be delivered on the first 70 urban areas.

11. Recuperability of Industry.

a. Much evidence has been accumulated by the United States Strategic Bombing Surveys as to the measures taken by the Germans and Japanese to maintain industrial production in the face of Allied air attacks. Study has been devoted to the levels of production which were achieved in the same selected target systems of the German and Japanese industrial establishment which are included as targets in current war plans applicable to the U.S.S.R.

The Germans and, to a lesser degree, the Japanese, depended on the following action to meet vital war production requirements:



- (1) Repair and restoration of damaged plants.
- (2) Accelerating production in plants not working at full productive capacity previous to damage to other plants in the same industry.
- (3) Conversion of plants from production of non-essential or non-critical items to meet more important needs.
- (4) Construction of new facilities either as replacement for or in anticipation of losses.

The U.S. Strategic Bombing Survey shows that by such action the Germans were able to maintain production and even to increase production rates in essential war materials until the weight and rate of Allied air attack attained overwhelming proportions in 1944, at which time German recuperative powers could not match the scale of attack and the pace of the advance of Allied armies.

b. It is to be anticipated that the U.S.S.R. would adopt, although not with the same degree of efficiency at this time, the same measures proved to be effective by the Germans. Evidence indicates the traditional ability of the Russians to accomplish much with little, to improvise, to repair and to undergo extreme hardship in their working conditions. This was best demonstrated in the Soviet rehabilitation of the transportation system, which was destroyed in areas occupied by the Germans. Soviet capabilities to restore bridges, rail installations and railroad equipment amazed even competent American engineers. However, such ability does not extend to the same extent in highly complicated facilities or installations dependent upon precise engineering performance. In this they are relatively inferior. Capacity and efficiency comparable to that of the Germans is not to be expected.

c. There is valid evidence that certain Soviet industries basic to either peacetime or wartime economy are presently strained to their maximum capacity to meet current needs.

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Noteworthy among these are steel, oil and rail transportation. Efforts to increase capacities in these categories are sharply limited by the time required to produce necessary tools, facilities, or raw materials.

It is doubtful whether such capacities could be augmented significantly in time of war or whether replacements for damage sustained would be practicable in any reasonable period of time. Some industries now operate within limits imposed by the supply of steel and availability of petroleum. Cushions in productive capacity which exist in these industries would afford the U.S.S.R. some flexibility in the absorption of war damage.

d. Experience has shown that the effectiveness of industrial recuperation depends among other things, upon the following factors:

- (1) Simultaneity of attack on all elements of any one system or supporting systems.
- (2) The rate at which damage is inflicted.
- (3) Frequency of subsequent attack.
- (4) Repair or replacement of damaged plants and tools.
- (5) Supply of raw materials.
- (6) Availability of essential utilities.
- (7) Availability of industrial engineering talent.
- (8) Adequacy of manpower.

With due regard for the widespread destructiveness of the contemplated offensive, the relatively short time in which so much damage is inflicted, the shortage of steel and petroleum, the number of personnel casualties and the shock and confusion on the population as a whole, it is considered that the U.S.S.R. would experience great difficulty in recuperating from the effect of the initial atomic offensive and restoring production to necessary levels. (Refer to Paragraph 9 page 17)

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12. The Soviet Will to Wage War. An appraisal of the psychological effects of the initial atomic offensive on the Soviet will to wage war is contained in Appendix "J" to this Enclosure. The significant conclusions of this study are as follows:

a. It would seriously disrupt temporarily, and impair indefinitely, the mechanisms of civil and military control. It probably would not destroy the roots of Communist ideology or critically weaken the power of Soviet leadership to control and dominate the people.

b. It would not turn the majority of the people against their government but would, in general, unify them and intensify their will to wage war. It would validate, in the minds of the majority, Soviet propaganda with regard to the intentions of foreigners to destroy the U.S.S.R. Intensified resentment would persist for an indeterminate period.

c. The will of an indeterminate minority to wage war will undoubtedly be weakened and certain elements will attempt to take advantage of the situation, but neither of these influences would be likely to develop to such an extent as to produce critical effect upon the total Soviet war effort.

d. Temporarily, it will create a widespread chaotic situation among the people, particularly in the urban areas. This situation may well cause a high degree of absenteeism and disorganization in industries essential to the war effort. This would force modification of Soviet invasion plans, and, in time, adversely affect the morale of the Soviet armed forces.

e. It will create within the U.S.S.R. a psychological crisis which could be turned to advantage by the Allies through early and effective exploitation by armed forces and psychological warfare. Failing prompt and effective exploitation, the opportunity would be lost and subsequent Soviet psychological reactions would adversely affect the accomplishment of Allied objectives.

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f. Any demoralizing effect among Soviet invasion troops will be of a delayed nature and will be dependent upon the fruits of their early invasion efforts.

g. As reports of results of the atomic offensive reach the people of Soviet satellite countries, both their sabotage of Soviet control and military effort and their partisan cooperation toward Allied objectives can be expected to increase with the hope of throwing off the Soviet yoke.

13. Effect of the Initial Atomic Offensive Upon the Soviet Armed Forces. The phasing of possible Soviet operations in the early phases of a war was discussed in Appendix "E" to this Enclosure. The effect of the atomic offensive on the Soviet armed forces as a result of damage to Soviet industry and the psychological impact on the Soviet people and government is set forth in Appendix "K" to this Enclosure, significant conclusions of which are summarized below:

Successful execution of the initial atomic offensive, as planned:

a. Would not, per se, seriously impair the capability of the Soviet armed forces to advance rapidly into selected areas of Western Europe, the Middle East, and the Far East, but capabilities thereafter in those extended areas would progressively diminish due to the following:

(1) The supply of petroleum products of all types will rapidly become critical to all branches of the Soviet armed forces, with principal effects of:

(a) Greatly reducing the mobility of the Army.

(b) Reducing the scale of operations of the Soviet Navy and merchant shipping, although submarine warfare would probably be unaffected.

(c) Seriously reducing Soviet air operations, involving training, transport, support of ground and

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naval forces, and independent offensive action, although proper allocation of fuel would allow continued operations by air defense forces.

NOTE: The point at which capabilities of Soviet armed forces would diminish to a critical degree would depend upon many variable or unpredictable factors, most important of which is the level of stockpiles prevailing at the initiation of hostilities.

b. After consumption of initial stocks of basic equipment and consumable supplies, progressive shortages in a wide variety of items, particularly aircraft, would handicap operations and affect morale of the armed forces.

c. Logistic support would be handicapped due to disruption of planning, impairment of controls, damage to industry, and interference with transportation.

d. The Soviet High Command will be forced quickly to re-estimate their strategic position and make important decisions regarding operational plans under difficult circumstances. They would probably limit, postpone or abandon certain campaigns, but it is impossible to predict what specific decisions would be made.

e. The atomic offensive would open the field and set the pattern for all adversaries to use any weapons of mass destruction and result in maximum retaliatory measures within Soviet capabilities.

14. General. Atomic bombing will produce certain psychological and retaliatory reactions detrimental to the achievement of Allied war objectives and its destructive effects will complicate post-hostilities problems. However, the atomic bomb would be a major element of Allied military strength in any war with the U.S.S.R., and would constitute the only means of rapidly inflicting shock and serious damage to vital elements of the Soviet war-making capacity. In particular, an early atomic offensive will facilitate greatly the application of other Allied military power with

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prospect of greatly lowered casualties. Full exploitation of the advantages to be obtained is dependent upon the adequacy and promptness of associated military and psychological operations. From the standpoint of our national security, the advantages of its early use would be transcending. Every reasonable effort should be devoted to providing the means to be prepared for prompt and effective delivery of the maximum numbers of atomic bombs to appropriate target systems.

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APPENDIX "A" TO ENCLOSURE "B"

UNITED STATES PLANS

1. The joint outline war plan TROJAN has been accepted for planning purposes to provide a basis for developing the initial operations of United States and Allied forces in the event that war has been forced upon the United States by acts of aggression by the U.S.S.R. and/or her satellites during the fiscal year 1949.

2. It is the over-all strategic concept of this plan:

"To destroy the will of the U.S.S.R. to resist by a main offensive effort in Western Eurasia and by a strategic defense in the Far East. Initially, to launch a powerful air offensive designed to exploit the destructive and psychological power of atomic weapons against the vital elements of the Soviet war-making capacity; to secure the Bering Sea-Japan Sea-Yellow Sea line and selected base area or areas; to secure the essential lines of communication; to provide essential aid to our Allies; to reduce the Soviet war potential by conducting political, psychological and underground warfare; and to prepare for such later operations as may be necessary for the attainment of our national objectives."

3. In furtherance of this concept tentative plans have been developed by the Strategic Air Command, in accordance with directives of the Joint Chiefs of Staff, to provide for delivering an initial powerful offensive utilizing atomic bombs against selected industrial units in seventy urban areas of the U.S.S.R. These objective areas are those which available intelligence indicates to include the heart of known industry most essential to the war-making capacity of the U.S.S.R. They are listed in J.C.S. 1974 (Atomic Weapons Supplement to TROJAN). It is planned to follow up the initial attack with a continuing

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air offensive both with atomic bombs and conventional weapons--bombs and mines--further to reduce the Soviet war-making capacity and to police the areas damaged as a result of the initial phase of the attack.

4. The details of the plan to deliver the initial atomic offensive are not essential to this particular study inasmuch as an evaluation of the chances of success in delivering the strategic air offensive is specifically exempt from this problem.* It is sufficient herein to note that TROJAN envisages basing the planes involved in the initial attack at suitable available airdromes in the United Kingdom, the Cairo-Suez area, Alaska, and Okinawa. Plans of the Strategic Air Command contemplate that attacks are to be delivered by medium bombers (B-29 and B-50) and heavy bombers (B-36). Primary reliance for medium bomber bases will be the United Kingdom with use of Cairo-Suez, Iceland, or Okinawa as deemed necessary at the time. Initial movement of essential personnel and material to the forward operating bases will be by air. Subsequent and continuing logistical support will be, in the main, by sea. Heavy bombardment units equipped with B-36 aircraft will operate from the United States via bases in Alaska.

5. The initial atomic offensive is to be delivered as quickly as operational and logistical considerations permit, and is to be distributed over a wide area of the U.S.S.R. proper. No atomic attacks are contemplated at present on targets outside the Soviet Union. The purpose is to hit hard and to attack a large number of Soviet urban areas in the shortest possible time. It is hoped thus to exploit the effects of surprise and shock, to provoke the spread and compounding of disaster

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rumors, and by widespread damage to interdependent industries to complicate and retard processes of recuperation. Operationally,* it is reasonable to expect that the untried Soviet air defenses will be least effective against initial attacks. The selection of numerous widely separated targets will tend to cause dispersion of Soviet air defenses and antiaircraft weapons. While the Chief of Staff, U.S. Air Force, is the Executive Agent of the Joint Chiefs of Staff for the strategic air offensive, operational details are in the main vested in the Commanding General, Strategic Air Command, U.S. Air Force. Operational plans are subject to continuing revision particularly with respect to the development of target information and objective data. At the moment, tentative plans are available for the initial atomic offensive, but plans for follow-up phases have not yet been sufficiently developed to warrant evaluation in this study.

6. At the present time the initial atomic offensive may be considered as having two stages. The first, to be accomplished prior to D plus 14 days, plans to attack 30 selected target cities considered to be of greatest importance and on which available target information is believed to be adequate for attack without preliminary reconnaissance. During this stage it is planned to conduct aerial reconnaissance of the remaining 40 target areas which are objectives of the initial atomic offensive with a view to supplementing available information as to these objectives. The second stage envisages attack on the remaining 40 target areas. Conduct of this attack will be influenced by operational experience and informational data gained during the first stage. It is anticipated that the second stage will be completed by D plus 30 days, at which time the major portion of the stockpile of atomic

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weapons available on D-Day will have been expended. In the Outline War Plan it is emphasized that the course of action to be followed in subsequent periods will depend in large measure on the rate of production of atomic bombs and on the results obtained from the initial atomic offensive, particularly with regard to the effects of the atomic attack.

7. Annex "A" to this Appendix sets forth the cities in which targets are located for each of the two stages of the initial atomic offensive together with the number of atomic bombs tentatively allocated to each urban area.

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APPENDIX "B" TO ENCLOSURE "B"

BASIS OF EVALUATION

In the effort to evaluate the effect of the initial atomic offensive on the U.S.S.R., it is first necessary to establish an acceptable basis upon which results can be measured. The problem may be divided into three parts:

- (a) An evaluation of material damage and personnel casualties.
- (b) An appraisal of psychological effects.
- (c) The application of the foregoing to the military capabilities of the U.S.S.R. in the light of conflicting war objectives of the U.S. and the U.S.S.R.

MATERIAL DAMAGE AND PERSONNEL CASUALTIES

From the material standpoint, the war effort of a nation involved in total war is dependent on the ability of its industrial establishment to replenish initial stockpiles of essential supplies in order to meet the vital requirements of the armed forces and to provide for the minimum acceptable level of civilian requirements. This industrial establishment includes the entire complex of systems involved in the provision, processing and transportation of raw materials, in fabrication, transportation and assembly of manufactured components into finished equipment, and in transportation of finished equipment and operating supplies to consumers. The industrial establishment may also be considered as composed of management, labor, plant facilities, and materials. Partial or complete elimination of any of the parts of the complex or components of the establishment will reduce or negate the utility of the whole.

It is appropriate, therefore, to evaluate the extent to which the initial atomic offensive will reduce the industrial establishment. It is desirable to evaluate the effects on as many specific systems or components of systems as available information will permit the derivation of valid conclusions.



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Damage inflicted on urban areas and the resultant personnel casualties should also be considered as they will have significant effects on reducing the war-making capacity of the U.S.S.R. and in retarding its subsequent restoration.

PSYCHOLOGICAL EFFECTS

An evaluation of the psychological effects should include the impact of, and reaction to, the bombing and the consequences thereof on the government, the civilian population directly affected, the civilian population not directly affected, the armed forces, and the populace of satellite countries. In the final analysis it should be determined to what degree the initial atomic offensive may affect:

- (a) Soviet control.
- (b) The attitude of the people.
- (c) The will of the armed forces to fight.

MILITARY CAPABILITIES OF THE U.S.S.R. IN THE
LIGHT OF CONFLICTING OBJECTIVES OF THE
U.S. AND THE U.S.S.R.

The reduction of the industrial establishment should be reflected in reduced capabilities of the armed forces to carry out required operations individually and in concert. These capabilities are dependent upon the adequacy of basic equipment (tanks, guns, aircraft, ships, etc.), and the supply of essential consumables (food, clothing, POL, ammunition, etc.). These items must be available at the right place at the right times in quantities commensurate with the type and scale of operations. Denial of either basic equipment or essential consumable supplies will reduce the fighting ability of the armed forces. The degree of the reduction and the question of whether or not it is critical or decisive is in turn dependent upon the objectives to be attained at the time and the type, magnitude, and timing of enemy opposition. It is appropriate, therefore, to evaluate the extent to which reduction or denial of essential items of Soviet armed forces will affect their

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abilities to conduct effective operations in the light of probable objectives and allied opposition.

The strategic aims of the U.S.S.R. have been considered in agreed intelligence estimates and/or the outline war plan to be:

- (a) Ultimately, world domination by the U.S.S.R.; and
- (b) Immediately, to seize control over key areas of the Eurasian land mass, including specific areas of Western Europe, the Middle East and the Far East.

The National Security Council has stated* that the general objectives of the United States with respect to the U.S.S.R., in time of peace as well as in war, should be:

"a. To reduce the power and influence of the U.S.S.R. to limits which no longer constitute a threat to the peace, national independence and stability of the world family of nations.

"b. To bring about a basic change in the conduct of international relations by the government in power in Russia, to conform with the purposes and principles set forth in the UN charter."

"War aims supplemental to our peacetime aims should include:

"a. Eliminating Soviet Russian domination in areas outside the borders of any Russian state allowed to exist after the war.

"b. Destroying the structure of relationships by which the leaders of the All-Union Communist Party have been able to exert moral and disciplinary authority over individual citizens, or groups of citizens, in countries not under communist control.

"c. Assuring that any regime or regimes which may exist on traditional Russian territory in the aftermath of a war:

"(1) Do not have sufficient military power to wage aggressive war.

"(2) Impose nothing resembling the present iron curtain over contacts with the outside world."

* Enclosure to J.C.S. 1903/3



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"d. In addition, if any bolshevik regime is left in any part of the Soviet Union, insuring that it does not control enough of the military-industrial potential of the Soviet Union to enable it to wage war on comparable terms with any other regime or regimes which may exist on traditional Russian territory.

"e. Seeking to create postwar conditions which will:

"(1) Prevent the development of power relationships dangerous to the security of the United States and international peace.

"(2) Be conducive to the successful development of an effective world organization based upon the purposes and principles of the United Nations.

"(3) Permit the earliest practicable discontinuance within the United States of wartime controls."

These aims and objectives considered in opposition one to the other are fundamental. Although the initial atomic offensive under consideration is but a part, albeit important, of all the military, psychological, political and economic operations necessary for the prosecution of a war of the nature and scope envisaged, consideration of its effects should be related to these conflicting aims and objectives. This should be with the view to expressing the degree to which the initial atomic offensive might influence strategy and contribute to Allied ability to counter Soviet aims and to Soviet ability to oppose the attainment of Allied objectives.

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TOP SECRETAPPENDIX "G" TO ENCLOSURE "B"METHODS OF ANALYSIS

In approaching the problem, the Committee studied Plan TROJAN and the supporting plans of the Strategic Air Command for the implementation of the initial atomic offensive. These plans were discussed with selected working teams of the Joint Strategic Plans Committee and with the Commanding General of the Strategic Air Command and members of his staff.

The pertinent intelligence was examined in detail. The Staff of the Joint Intelligence Committee was consulted in regard to agreed intelligence estimates. In addition, the intelligence branches of the Army, the Navy, and the Air Force were consulted on matters under their cognizance.

Specific requests were submitted to these intelligence activities for information essential to the study. The Committee examined the methods used and sources employed by these agencies in their assembly of information basic to the determination of the scope and composition of Soviet industrial capacity.

To facilitate determination of the expected damage effect and the capabilities and limitations of atomic weapons, the Committee referred to documents and publications of the Atomic Energy Commission, the reports of the U.S. Strategic Bombing Surveys of Germany and Japan, and pertinent papers of the Joint Chiefs of Staff. All members of the Committee were cleared for access to such "Restricted Data" as was necessary for the study.

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Examination was made of the methods of target selection and determination of aiming points used by the Strategic Vulnerability Branch in the preparation of the target folders furnished to the Strategic Air Command. The services of a group of outstanding mathematicians were obtained through the cooperation of the Head of the Research and Development Board. These consultants assisted the Committee in its examination of the methods of the selection of aiming points and the calculations involved in determination of probability of damage to selected targets.

The Committee was furnished target folders prepared by the Strategic Vulnerability Branch for the urban industrial areas of the Soviet Union. These were examined as to aiming points, buildings, facilities and installations located in the areas of anticipated damage for each aiming point, and installations outside the areas of anticipated damage. The Strategic Vulnerability Branch also submitted available damage estimates for the urban objective areas in terms of the percentage of known Soviet capacity for selected systems or segments of the industrial establishment. Spot checks were made as to the adequacy, authenticity, and accuracy of this information in order to determine a measure of the evaluation as a whole. As a result of the foregoing procedures, estimates were made as to the reduced industrial capacity of the U.S.S.R. in certain selected items essential to their war effort. Estimates were limited to a small group of selected vital complexes because intelligence data concerning other complexes were either incomplete or it was impracticable for the intelligence agencies to summarize available data within time to be of benefit to this Committee. (Refer to Annex "A" through "G" to Appendix "I" to Enclosure "B".)

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The Committee gathered such information as was available from intelligence sources as to the extent of Soviet stockpiles of essential military equipment and supplies, and as to the requirements of the Soviet armed forces to meet anticipated operations. This was evaluated in terms of production requirements and the extent to which production requirements could be met from a reduced production from within the U.S.S.R., from satellite countries, from captured territory or from other sources likely to be available. Separate studies were made on specific basic materials such as oil, steel, chemicals, and basic utilities (transportation and power), endeavoring to translate the direct effects of the bombing into impact on the war economy and military capabilities of the Soviet armed forces.

As a separate approach the Committee determined the total urban area of the U.S.S.R. of cities of 50,000 known population or greater in which it is generally accepted that practically all of Soviet industry is located. This area was compared to the total area likely to be damaged by all of the bombs planned to be delivered to the selected aiming points provided for in current plans. There was thus obtained an estimate of the percentage of total Soviet industrial capacity likely to be destroyed or damaged and the casualties to personnel. (Refer to Annex "H" of Appendix "I" to Enclosure "B".)

By the nature of the second part of the problem--appraisal of the psychological effect of the bombing on Soviet will to wage war--the Committee was forced to proceed along different lines. It was first necessary to acquire a background knowledge of the history, traditions, traits and characteristics of the people of the U.S.S.R.; to consider the salient features of Communist doctrine; and the depth and character of its penetration among the people; the means and methods used in the

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APPENDIX "D" TO ENCLOSURE "B"

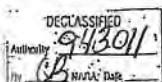
DISCUSSION OF INTELLIGENCE

The Committee has noted that the task of assessing the adequacy and validity of intelligence related to this problem is properly the responsibility of the Joint Intelligence Committee. However, the validity of any evaluation of the effects of the initial atomic offensive on the Soviet people and their war effort is, in a large measure, dependent upon the supporting intelligence. Hence, comments in this section are made solely for the purpose of describing the extent and detail to which this Committee was able to proceed in solving the problem and the extent to which it is practical at this time to derive valid conclusions.

The Committee was assisted by all pertinent U.S. intelligence agencies, including the Intelligence Division, U.S. Army, the Office of Naval Intelligence, U.S. Navy, the Air Intelligence Division, U.S. Air Force,

and on request was furnished specific information pertinent to the problem. Observations of the Committee indicate among these agencies a high degree of cooperation and that the methods used in compiling, filing and utilizing the available information on Soviet industrial capacity are sound, thorough, and objective. Any delays or failures in the free exchange of information can be attributed to the difficulties inherent in sorting and distributing the large volume of data involved. It was noted that information is being placed on cards for specially designed business machines. When completed this system should facilitate greatly the maintenance of records and the utilization of information for future estimates of this nature. A free exchange appears to be continuous between British and American agencies thus substantially broadening the scope and value of source material.

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U.S.S.R. and the satellite countries to force adherence to Communism and to Soviet control through discipline, police control, propaganda, censorship and fear; tendencies and opportunities to resist or overthrow this control. This background was acquired by reading books, reports and studies bearing directly on the problem. This included minutes of a seminar under the auspices of the Institute for Advanced Studies, Princeton University, and a research study on Soviet society, in process at the University of Michigan. The Committee also interviewed a number of individuals who, it was considered by reason of their qualifications, positions or experience, might furnish the Committee information of value in studying this problem. These included the recent U.S. Ambassador to the Soviet Union, Lieutenant General Walter B. Smith; the present Naval Attache to the U.S.S.R., Rear Admiral L. C. Stevens; Mr. Durbrow of the State Department, formerly on duty in the U.S.S.R; Mr. Thayer of the State Department in charge of "Voice of America" broadcasts; Dr. McDowell of the Department of the Army, and numerous officers of the Army, Navy and Air Force who had served in the U.S.S.R. in one capacity or another during or since World War II.

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APPENDIX "D" TO ENCLOSURE "B"

DISCUSSION OF INTELLIGENCE

The Committee has noted that the task of assessing the adequacy and validity of intelligence related to this problem is properly the responsibility of the Joint Intelligence Committee. However, the validity of any evaluation of the effects of the initial atomic offensive on the Soviet people and their war effort is, in a large measure, dependent upon the supporting intelligence. Hence, comments in this section are made solely for the purpose of describing the extent and detail to which this Committee was able to proceed in solving the problem and the extent to which it is practical at this time to derive valid conclusions.

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Appendix "D" to

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"It is unlikely that the psychological weaknesses in the Soviet and Satellite structure would produce serious consequences unless:

(a) The Soviet orbit were subjected to intensive and effective aerial attack from the West;

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"(b) The prospect for ultimate victory further diminished because of the continued pressure of sea power as exercised through blockade and commerce destruction, although a sea blockade of the Soviet Union would not be as effective as against a more insular power;

"(c) Or it seemed to them that the Soviet Union was faced with a protracted war doomed to end in Soviet defeat."

"It is concluded from consideration of Soviet political, economic, and military strength and weakness factors, that against probable opposing forces the Soviets have the combat power to overrun key areas in Europe and Asia. The primary source of Soviet combat power is the Soviet Army which is supported by a numerically strong tactical air arm, a small surface fleet and a relatively strong submarine arm. An additional source of combat power is the small but expanding strategic air arm. Following the seizure of certain key areas in Europe and Asia, the capabilities of the Soviet Union to occupy, hold and exploit these areas would, to a great extent, depend upon the ability of opposing forces to exploit successfully those weaknesses enumerated above."

The operations of Soviet military forces, the direction and extent of their offensives and the opposition expected to be encountered has a direct bearing on the expenditures of military supplies and material and the extent of Soviet gains to be derived in immediate booty, resources and industrial capacity for future possible exploitation. Hence, it is pertinent to digest for reference the estimated time schedules for Soviet operations as set forth in ABAI-5. In considering this estimated time schedule the following quotation from ABAI-5 should be borne in mind.

"Although the United States and the United Kingdom may employ weapons of mass destruction, the Joint Intelligence Committees have not been informed of the timing, scale, and effectiveness of possible Allied attacks using these weapons. In weighing Soviet capabilities it has been impossible, therefore, to assess the effect of the use of these weapons on the Soviet Union. However, it is emphasized that employment of them could be expected to affect the progress of Soviet campaigns."

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Subject to the foregoing, the phasing of Soviet operations estimated in ABAI-5 is:

a. Western Europe. Soviet operations in Western Europe could involve simultaneous attacks to overrun Western Germany, France, the Low Countries and Denmark. The Soviet Union will deem it necessary to advance to the Pyrenees and the Mediterranean Coast in order to cut off retreating French forces, secure the Spanish frontier and to seize ports in Southern France.

It has been estimated that these operations could be completed to the Rhine by D/5 to 10 days;* to the Meuse-Somme line by D/15 to 20; to the Seine by D/25; to the Pyrenees, the Mediterranean and the Atlantic by D/50 to 60.

b. Italy and Sicily. A campaign could be undertaken against Italy and Sicily simultaneously with that against other portions of Western Europe.

It has been estimated that the offensive could reach the Rome-Pescara line by D/45 to D/60, complete the occupation of Italy by D/75 and Sicily by D/100.

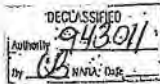
c. Scandinavia. The Soviet Union might conduct a campaign against Scandinavia concurrently with other operations beginning approximately 40 days after D-day. Using Denmark as a base, the U.S.S.R. could attack southern Sweden, then southern Norway and simultaneously in the north against Norway and Sweden.

It has been estimated that the foregoing operations could be completed within 35 days or about D/75.

d. Greece. The Soviets could conduct operations in Greece and the Aegean Islands simultaneously, or in near concurrence, with offensives in the Middle East and Western Europe.

It has been estimated that Greece proper could be overrun by D/70 to 75.

* All estimates are in days



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e. The Middle East. Main thrusts in the Middle East could be directed at the vital Allied oil resources in Iran, Iraq, Saudi Arabia and base areas and lines of communication terminating in the Suez Canal Area. To gain objectives quickly, the operations might be conducted simultaneously with those in Western Europe and Greece.

In summary, it has been estimated that these areas could be seized by D/60-80 with the exception of the campaigns through Palestine and the Jordan Valley to Cairo-Suez-Alexandria which would not be secured until D/175.

f. Turkey. The Soviet Union would probably consider it necessary to attack Turkey simultaneously with their general offensive in the Middle East.

It has been estimated that the Ankara-Ismir line could be consolidated by D/90 and, depending upon progress of the separate campaign for the Middle East, the Alexandretta area by D/120 to 150.

g. Far East. Soviet operations in the Far East would probably involve the seizure of South Korea and key strategic positions in North China. Operations could be primarily to deny areas to the U.S., to neutralize threatening forces, and for harassing and diversionary purposes.

The main effort in the Far East could probably succeed in overrunning South Korea by D/20 and other operations could be kept well within Soviet logistic capabilities.

h. The United Kingdom. No detailed estimates are included in ABAI-5 of the nature and scale of operations against the United Kingdom inasmuch as the type and phasing would be dependent upon the progress of other campaigns. However, neutralization or seizure of the United Kingdom would involve the heavy and sustained application of Soviet air power possibly including guided missiles (V-1, V-2 type)

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and Soviet sea power including mines and submarines. A contemplated invasion of the United Kingdom would require large-scale logistic support for all types of Soviet armed forces.

1. Sea and Air Offensive Against Anglo-American Sea Communications. The main attack on sea communications will probably take the form of continuing operations on ports and approaches by mining, torpedoes, bombing and sabotage. Such attacks would be carried out in the main by both aircraft and submarines allocated to those areas where the tactical situation indicates the targets to be most profitable and the opposition least effective. It is to be presumed that maximum available effort would be devoted to this campaign on a continuing basis.

SUMMARY

Summarizing these estimated objectives and capabilities:

The heaviest commitments and expenditures of military supplies - for Soviet ground forces would be from D to about D/90 and might then be markedly reduced provided the U.S.S.R. has by then overrun Western Europe, Italy (except Sicily), Scandinavia, Turkey (except the Alexandretta area), the Middle East (except for the Palestine, Jordan Valley and Suez areas), and the Far East. However, heavy drain on U.S.S.R. resources will continue even prior to the development of an Allied surface offensive for normal support of large ground forces on extended fronts, to meet combat requirements at points of contact and in internal areas to consolidate positions and cope with underground movements.

Additional continuing demands will be placed on Soviet air and naval forces to cope with the increasing tempo of Allied attacks as well as for Soviet offensives by these services. In particular air operations in the defense of

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the U.S.S.R., offensives against the United Kingdom or at long range against the United States and in support of ground forces in the Middle East will require continuing supply of petroleum products, replacement aircraft, engines and equipment, spare parts and munitions. Soviet submarine operations while requiring relatively small quantities of fuel will necessitate re-supply of torpedoes, engine parts and electronic equipment as well as new craft to sustain the tempo of wide-spread operations.

Air, ground and naval forces will require elaborate training programs to support the operating elements of these services for protracted campaigns. Of necessity these programs will have to be prosecuted largely within the U.S.S.R. proper and will in turn require substantial expenditures of fuel and equipment.

All Soviet military forces within and especially outside the U.S.S.R. will impose heavier demands on the transportation system in the U.S.S.R. and in occupied territory. As the fronts are extended, requirements for transportation will increase to a degree depending upon the scope and tempo of operations.

Details in regard to stockpiles and expenditures of essential war materials by the U.S.S.R. are set forth in Annex "A" to this Appendix and information relative to the Soviet industrial position in Annex "B" to this Appendix.

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ANNEX "B" TO APPENDIX "E" TO ENCLOSURE "B"

SOVIET INDUSTRIAL POSITION

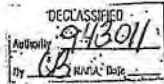
Section I of Appendix "A" to Enclosure "C" shows in summary form the Central Intelligence Agency's estimate of current annual production of selected items in the Soviet Union, the Satellite countries, and other parts of Continental Europe. The Central Intelligence Agency has indicated the margin of error to which these estimates are subject. They vary from 10 to 25 percent.

The estimates contained in Enclosure "C" are of current* production, hence, subject to marked change in the event that the U.S.S.R. increases measures for industrial mobilization for war. In considering differences between current annual production and productive capacity, it should be noted that adequate time must be allowed for manufacturing or processing establishments to:

- (a) Convert from peacetime to wartime production;
- (b) Accelerate production of war supplies, and
- (c) Adjust to wartime conditions.

Furthermore, actual production of war equipment, munitions and supplies will always be limited by the production and processing of raw materials, the output of basic industries, availability of production personnel, and the capabilities of essential utilities such as electrical power and transportation.

* Underlined for emphasis



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APPENDIX "F" TO ENCLOSURE "B"

PASSIVE DEFENSE MEASURES

The chances of success of delivery of the initial atomic offensive is beyond the scope of this study, therefore, it is inappropriate to consider herein the active* defense measures which the Soviet Union might adopt. On the other hand, there is a broad field of passive* defense measures which can be adopted prior to and during hostilities to minimize the effects of air attack either by atomic or conventional weapons. Included in this category are such important measures as:

1. The exercise of security and deception on information;
2. Dispersion of industry and redistribution of the population;
3. Underground construction for important facilities;
4. Construction of personnel shelters;
5. Development of civil defense organization and controls;
6. Education, training, and propaganda;
7. Provision of equipment for disaster control and recuperation;
8. Elimination or protection of vulnerable installations in transportation and communication;
9. Dispersion of stockpiles of food and essential war materials.

Substantial accomplishment of such measures would serve to reduce material damage and personnel casualties, improve ability to control the population before and after attacks and facilitate restoration of essential facilities.

* Underlined for emphasis

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Information from other intelligence sources confirm the foregoing. On the other hand the CIA has also stated in Enclosure "C" that "The Soviet policy-makers have evidently decided to belittle the atomic bomb's powers at every opportunity and to minimize its dangers to the U.S.S.R. Every bit of information that can be interpreted in this sense is seized upon at once for its propaganda value." This policy could be interpreted as a potential influence either to reduce panic and hysteria from initial attack or to increase surprise and shock.

In considering what has or can be done within the U.S.S.R. along the lines of passive defense several important factors should be noted.

First: The general practice by the U.S.S.R. of exercising security on all matters relating to its military position applies to passive defense measures and industrial facilities.

Second: The U.S.S.R. was forced to adopt passive defense measures over much of its territory in the past war. In addition, the U.S.S.R. has had the opportunity to profit by German, British and Japanese experience as well as published material in the United States on the effects of atomic bombs.

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Third: The general pattern of industrial construction and postwar reconstruction in the U.S.S.R. provides for the development of seven self-sufficient industrial areas and a degree of dispersion within these areas.

Fourth: Normal efforts now being made to improve the transportation system of the U.S.S.R., particularly the railroads, provide for reducing its vulnerability to air attack.

Fifth: The organization for police control, propaganda and indoctrination constitute an existing framework for education, training, and execution of passive defense and disaster control measures on short notice.

Sixth: The U.S.S.R. has been maintaining a strong military position and is capable of mobilizing quickly for total war.

Analysis of available intelligence leads to the conclusion that:

(a) Information is available to the U.S.S.R. as to passive defense measures which would reduce material damage and personnel casualties from atomic bombing and facilitate maintaining or regaining control of the population and in restoration of damage.

(b) The government of the U.S.S.R. is aware of the threat to them of atomic attacks and trends are evident that steps are being taken within limitations of time and resources to reduce the impact on vital elements of their war-making capacity. Many passive defense measures could be implemented quickly.

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(c) Underground construction has been provided in a number of cases for important command posts, communication centers and some emphasis has been placed on such construction for fortifications, supply depots, and critical industrial establishments. Aircraft hangars and command posts are known to exist underground at some of the important air force installations.

(d) Location of supply dumps and stockpiles, on which information is limited, follows a logical pattern for the support of the armed forces, consistent with transportation facilities available, and with evidence of dispersion to reduce vulnerability from all types of attack.

(e) Substantial accomplishment of measures specifically designed to minimize material damage or provide shelters for the urban population as a whole from atomic attack is not yet in evidence in the U.S.S.R.

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TOP SECRETAPPENDIX "G" TO ENCLOSURE "B"DISCUSSION OF DAMAGE EFFECT OF THE DIFFERENT ATOMIC BOMBS AS TO BLAST, FIRE, RADIOLOGICAL ASPECTS

In evaluating damage effects great care must be taken not to either over-estimate or under-estimate the effects of the bomb or the physical vulnerability of the target. Evaluation of the effects of the initial atomic offensive against the U.S.S.R. requires a summary of the damage to be expected from the type of atomic weapons currently available in the stockpile. It is the purpose of the ensuing paragraphs to present such a summary in non-technical form and to describe the effects which would result as indicated by the two bombs which have been dropped over Japanese urban areas and by the characteristics of the bombs now available. The effects fall into two major categories:

- a. Damage to material;
- b. Personnel casualties.

Experience in War with Japan

The U.S. Strategic Bombing Survey examined areas in Japan which had been subjected to atomic bombing and conventional bombing. This Survey concluded that the same damage which resulted from a Nagasaki-type bomb could be obtained by the use of 2700 tons of conventional bombs with the proper proportion of high explosive, incendiary, and fragmentation types. Many factors prevent direct comparison of conventional bombs with atomic bombs, and there is wide variation in the estimates of the atomic bombs which would be equivalent to the 1,989,979 tons of conventional bombs which were directed at target systems of Axis Europe. A substantial proportion of the tonnage dropped in Europe did not fall in urban or built-up industrial areas and was delivered over a period of two and one-half years. Damage estimated for Japanese cities

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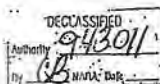


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would not apply strictly to cities of different construction characteristics. For instance, nearly all the homes in Japanese cities were of light frame construction, or even a more fragile type, and were built closely together, while it has been estimated that a large percentage of the homes in the U.S.S.R. are of the log cabin type and are probably at least equivalent in strength to heavy frame buildings. There is another disparity in the case of damage to be expected from secondary fires, inasmuch as the Japanese construction was more inflammable and, generally, in urban areas, more closely concentrated than that in the Soviet Union. It is not possible to inflict extensive damage as rapidly with conventional bombs as with atomic bombs. The "rate of attack" factor is discussed under "Recuperability," paragraph 11, of Enclosure "B".

In the case of the Japanese cities, the fire damage was largely contained within the blast damage area so that the fire complemented serious damage already existing from blast. This may not always obtain in the future. The conclusion of the Strategic Bombing Survey was that the area of destruction at Hiroshima was 4.7 square miles and at Nagasaki 1.8 square miles. However, the area of damage at Nagasaki was limited by the small size of the rather isolated section of the city over which the bomb exploded and the fact that sections of the city were protected by intervening hills. Otherwise, considering the equivalent energy release of these two bombs (the Nagasaki bomb being the more powerful), the destroyed area in Nagasaki would have been several times larger. Such variations in damage will be discussed later.

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Damage to Material

In current plans, the aiming point of each bomb is selected so that the position of the bomb burst will have at least a 75% probability of producing Class "A" damage to the principal targets of attack. Class "A" damage is that which renders a building or installation unsuitable for its intended use until major reconstruction is accomplished. In some cases, it will result in total destruction of the contained supplies, furnishings and equipment; in other cases, the primary equipment may remain undamaged notwithstanding wall collapse, missile effects and fires because of the ruggedness or indestructibility of the contents. Areas of Class "A" damage are shown in Table II of the Annex to this Appendix.

Personnel Casualties

The most striking effect of the two Japanese bombs was the great number of personnel casualties which were inflicted. A plausible estimate of the various causes of death would be as follows:

Flash Burns	20 to 30 per cent
Other Injuries	50 to 60 per cent
Radiation Sickness	15 to 20 per cent

Many of the people who died were subjected to several types of injuries, anyone of which would have been fatal.

Flash Burns

It has been estimated that the ground temperature at 1500 feet from ground zero at Hiroshima had an instantaneous value exceeding 2000°C., and that the following heat wave extended over a large area reaching great intensity within a radius of from 3000 to 4000 feet. The degree of burns varied with the protection afforded individuals by buildings and clothing.

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Other Injuries

Effects produced by over-pressure alone on Japanese personnel seem to have been rare, there being among survivors very few cases of ruptured eardrums at Hiroshima and Nagasaki. Most of the injuries were from secondary causes which resulted from collapsed buildings and flying missiles. Secondary burns probably accounted for a considerable number of deaths in Hiroshima and Nagasaki, these being caused by structures being blown down upon people and shortly thereafter catching fire. Many people who were injured and pinned beneath debris succumbed to the effects of heat from the burning collapsed buildings.

Radiation Sickness from Primary Fission Products

Radiation effects from primary fission products were not sufficient to produce casualties under conditions such as those which existed in Japan, and it is believed that the deposit of primary fission products will not be an important factor in air bursts which are planned in TROJAN.

Radiation Sickness from Radiation During Fission

Gamma rays and neutrons liberated by, and during, the fission process produced nearly all significant radiation injury. Doses of neutron and gamma radiation sufficient to cause severe cases of radiation sickness extended to a radius of about 4500 feet from the point of explosion (not measured from ground zero). Death from radiation sickness, although delayed, was almost certain to those exposed explosion survivors up to a distance of 3600 feet from the point of explosion. The danger from nuclear radiation to unshielded and exposed personnel was negligible at about one mile from ground zero. In general, it may be expected that in the case of air bursts the possibility of being killed by blast, heat, missiles and fires would cover the radius of danger specified for death resulting from radiation.

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This Committee considers the above described effects are a reasonable index of atomic bomb damage in the future.

Current Data in Use

Table I of the Annex to this Appendix, as used by the Strategic Vulnerability Branch of the Air Intelligence Division, lists the common types of building construction, with the corresponding over-pressures (pounds per square inch above atmospheric pressure) to cause Class "A" damage.

This Committee has obtained data from the Atomic Energy Commission, as of 1 April 1949, as to what areas would be under an over-pressure of four, six and eight pounds per square inch for bombs of each type at the burst heights shown. These values were calculated for flat target surfaces without a target array. (See Table II of the Annex to this Appendix.)

Data Used in Annex "H" to Appendix "I" to Enclosure "B" - (Area Study)

The proper values of Tables I and II of the Annex to this Appendix combined with burst heights which were consistent with those selected by the Strategic Vulnerability Branch, were used in the estimates made in Annex "H" to Appendix "I" to Enclosure "B" of this report for estimates of damaged areas and personnel casualties. In those estimates the area of damage was calculated on the basis of damage which would result from 5 psi, thus insuring damage to domestic wood frame and single-story, load bearing wall buildings.

In connection with material damage, variations may be expected in area, and on the targets within areas, as was demonstrated at Hiroshima and Nagasaki. The following table shows damage and personnel casualties for Hiroshima and Nagasaki:

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	<u>Hiroshima</u>	<u>Nagasaki</u>
Population density per square mile	35,000	65,000
Square miles destroyed	4.7	1.8
Killed and missing	70/80,000	35/40,000
Injured	70,000	40,000
Mortality rate per square mile destroyed	15,000	20,000
Casualty rate per square mile	32,000	43,000

The average population density of the 70 cities considered in TROJAN is estimated to be 10,000 per square mile, and it should be noted that in determining the mortality and casualty figures in Annex "H" to Appendix "I" to Enclosure "B" direct proportions of densities of population were used, in spite of the fact that both Japanese explosions occurred at times during which the regular daily routine maximized the number of casualties, and, at Hiroshima, just after the "all clear" release following an air raid warning. Estimates of casualties for future atomic explosions are difficult to make, since effects would vary with the time of attack, normal routine of the people concerned in the attack, and passive defense measures which might be taken. Therefore, it is felt that the estimate in Annex "H" to Appendix "I" to Enclosure "B", as derived from the above figures, may be the upper limit of casualties to be expected.

Qualifications in Use of Data for Determining Damage

Substantial variations in damage result from many factors which should be considered in using any theoretical or empirical data such as have appeared in this Appendix. In general, these factors tend to reduce the expected damage. The topography of the ground, variations in weather conditions, the plan form, and structural characteristics of the target

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array are examples. Wind conditions may result in focusing the shock wave, increasing the pressure in unexpected directions with corresponding decreases in other directions. Informed opinion is to the effect that large amounts of moisture in the air, such as fog or rain, will substantially reduce the blast effect. Damage may be decreased depending upon the degree of effectiveness of passive defense measures in the bombed area. (See Appendix "F" to Enclosure "B".)

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TOP SECRETAPPENDIX "I" TO ENCLOSURE "B"DETERMINATION OF MATERIAL DAMAGE AND PERSONNEL CASUALTIES

Annexes "A" to "G", inclusive, to this Appendix are separate studies on the estimated effects of the initial atomic offensive on selected segments of the Soviet industrial establishment. Annex "H" to this Appendix consists of a study on the estimated damage which is liable to be inflicted on Soviet industry as a whole and the personnel casualties which might be experienced by Soviet urban populations. Significant conclusions of Annexes "A" to "H" to this Appendix are as follows:

PETROLEUM:

1. Successful execution of the initial atomic offensive as planned would:

a. Result in a 70% or better probability of Class A damage to 76.4% of the USSR throughput refining capacity;

b. Result in a 70% or better probability of Class A damage to 100% of the USSR high octane avgas refining capacity;

c. Result in a stringent reduction in the supply of petroleum products to the Soviet armed forces and in a corresponding reduction in overall Soviet military capability;

d. Result in a critical shortage of high octane aviation gasoline, with a corresponding reduction in the combat effectiveness of the Soviet air force.

Note: The time at which shortages of petroleum products for the Soviet armed forces becomes critical will depend largely upon the levels of POL stockpiles prevailing at the initiation of hostilities and the efficiency with which the USSR is able to exploit remaining refinery capacity, including that for synthetic fuels.

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2. The Soviet oil refining industry appears to constitute a most lucrative target and serious consideration should be given to making it the primary objective, with either atomic or conventional bombs, of the initial atomic offensive.

STEEL:

1. The successful execution of the initial atomic offensive as planned has a 70% or better probability of reducing the productive capacity of raw steel in the Soviet Union by 45.5% or approximately 7-1/4 million tons per year leaving a remaining capacity of about 10-3/4 million tons per year pending restoration of damage or augmentation from other sources.

2. An indeterminate but substantial portion of Soviet steel processing facilities would be destroyed or damaged. This should adversely affect capabilities to restore damage both in the steel industry and other industries and would result in directly reducing the output of war materials.

3. Damage inflicted would be serious but the effect on the war effort would be primarily of a long-range nature in creating shortages of finished war materials. Given time much of the damaged producing and processing machinery can be salvaged, repaired or restored to operations.

4. Partial relief of steel shortages should be possible from satellite countries and conquered areas but time in excess of one year will be required to exploit substantially such sources.

SYNTHETIC RUBBER:

1. During the first year of war the Russian war effort will not be critically affected by the damage to the synthetic rubber industry caused by the initial atomic offensive. Although there is a 70% or better probability of Class A damage to 57% of synthetic rubber capacity, the civilian economy should be able to absorb such shortages as may exist.

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2. During the second and succeeding years of war, shortages would become critical and would be reflected in decreased mobility of the Soviet armed forces and in the civilian economy, unless damaged facilities are restored or replaced by conversions.

AIRCRAFT AND AIRCRAFT ENGINES:

1. Successful execution of the atomic offensive as planned would result in a 70 per cent or better probability of Class A damage to 59 per cent of Soviet aircraft assembly capacity, and to 68.3 per cent of aircraft engine capacity. In addition, indeterminate damage of a serious nature would be inflicted on sources for production of aviation equipment and accessories.

2. Damage to the two known plants producing long-range bombers would progressively reduce Soviet capability for long-range air bombardment. With the reduction in flow of replacement aircraft and engines to operational units and for training, the USSR will be forced to reduce progressively air power for independent, cooperative, and supporting operations.

3. Coupled with the shortage of aviation gasoline, the reduced production of aircraft will force extreme selectivity in air operations and constitute a serious deficiency in Soviet military capabilities.

MACHINE TOOLS:

1. Neither the machine tool industry nor inventory stocks provide appropriate targets of themselves for inclusion as primary targets in the initial atomic offensive.

2. Successful execution of the initial atomic offensive as planned will:

a. Provide 70 per cent, or better, probability of Class A damage to 23.9 per cent of the plants of the machine-tool industry;

b. Effect considerable, but an indeterminate amount of destruction or damage to machine tools, either installed or

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stocked, incidental to the destruction of industrial plants to which they pertain.

3. Damage to either the machine-tool industry or to machine tool inventories of the USSR, from successful execution of the initial atomic offensive, would result in severe but not critical impact upon the Soviet war effort.

ELECTRIC POWER:

1. Successful execution of the initial atomic offensive, as planned, would:

- a. Result in a 70 per cent or better probability of Class A damage to 12 per cent of USSR electric generating capacity, and cause considerable damage to local transformers, distribution installations and equipment throughout the 70 target areas;

RAIL TRANSPORTATION:

1. The rail transportation system has not been selected as a specific primary target in the initial atomic offensive nor is it a suitable primary target for conventional attack with the forces likely to be initially available.

2. Direct damage inflicted on railroad lines and yards as a result of the initial atomic offensive against 70 urban areas will be limited in scope, and generally susceptible to rapid repair by manpower largely unskilled.

3. Indeterminate, but estimated to be considerable, damage will be inflicted on control facilities and rolling stock that may be located in marshalling and classification yards in areas under attack.

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4. Heavy damage will occur to the facilities for building, maintaining and repairing railroad equipment. This is bound to be serious, since this portion of Soviet industry is already functioning at maximum capacity.

AREA BASIS:

1. Successful execution of the initial atomic offensive as planned would:

a. Result in damage to Soviet urban areas as indicated in the following table:

Damage Depending upon Type of Structure	Minimum Lbs/sq.in. Overpressure	Approximate Square Miles of Soviet Urban Areas Destroyed or Damaged	Approximate Percentage of Total Soviet Urban Areas (50,000 or Greater) Destroyed or Damaged
Destroyed to Heavy Damage	8	320	13
Destroyed to Medium Damage	6	460	19
Destroyed to Light Damage	5	650	27
Destroyed to Superficial Damage	4	840	35

b. Be liable to inflict Class A damage on about 20 - 30 per cent of the Soviet Industrial Establishment as a whole.

c. Produce as many as 2,700,000 mortalities, 4,000,000 additional casualties, destroy a large number of homes, and vastly complicate the problems of living for the remainder of the 28,000,000 people in the 70 target cities depending on the effectiveness of Soviet passive defense measures.

Note: The foregoing results should be adjusted up or down in direct proportion to the total number of bombs actually delivered on target areas.

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CUMULATIVE EFFECTS

The wide distribution of damage on urban areas throughout the USSR with associated shock, confusion, and casualties to personnel, as well as the rate at which damage and casualties are inflicted, will have an additional cumulative effect on industry essential to the Soviet war effort. Although aiming points are selected primarily to focus the damage on specific industries and industrial concentrations, it is inevitable that actual damage will be indiscriminate as to types and functions of other installations within the target areas. This will affect adversely all phases of Soviet economy and the ability of the Soviet people to carry on effectively with work necessary for the prosecution of a war.

The amount and rate at which damage and personnel casualties are inflicted will also have adverse effects on recuperative measures which will need to be taken to restore order and production essential to the war effort. Immediately after each atomic explosion, the surviving population in the affected area will be posed many complicated problems such as simultaneously caring for casualties, extinguishing fires, restoring essential utilities, providing food and shelter, and clearing rubble. The people will be called upon to meet these problems immediately and at a time when shock and fear are prevalent, leadership is handicapped, many key personnel are killed or missing, and controls are disrupted. Each operation will place heavy demands on the available manpower and the effective accomplishment of each will be dependent upon the others. The destruction of large numbers of homes will impose lasting hardships on an urban population already overcrowded and existing on a marginal status.

All of the foregoing tasks will have to be faced before reconstruction of industrial facilities can be undertaken and production restored in whole or in part. In the reconstruction of facilities or the restoration of production, it is to be remembered that dependence must be placed on other industries and utilities, many of which may have been concomitantly damaged

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or are suffering from the collateral effects of damage elsewhere. The interdependency of all industries and services is a factor of importance in normal production, in the restoration of damage and in reestablishing production from previously damaged plants.

The damage, personnel casualties and effects therefrom have been estimated on the basic assumption that the initial atomic offensive contemplated in current war plans (TROJAN) is successfully executed as planned. This applies both to the quantity of bombs and the period in which they are delivered. Should a lesser number of bombs be actually delivered on targets, or the rate of delivery be substantially slower, the damage, casualties and effects would be less. Should a larger number of bombs be delivered on the targets, and the rate of delivery the same or greater, the damage, casualties and effects would also be greater. In either case, reevaluation should be made.

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ANNEX "H" TO APPENDIX "I" TO ENCLOSURE "B"

DETERMINATION OF DAMAGE TO SOVIET INDUSTRY
AND
POPULATION LOSSES ON AN AREA BASIS

The war effort which a nation is capable of exerting is dependent upon the ability of its industry to maximize production essential to carrying on a war. Any decrease of industrial output is reflected by a subsequent reduction in supply of basic equipment and essential consumable supplies to the armed forces. The principal objective of the strategic air offensive is the destruction of essential elements of the Soviet industrial establishment--with a view towards reducing and, if possible, completely stopping production of essential supplies and materials both required by the armed forces and civilian consumers. The exact extent to which the Soviet industrial capacity would be reduced by the initial atomic offensive cannot be accurately and completely determined at this time, because the intelligence available is insufficient.

It is generally accepted that practically all Soviet industry is located in or identified with Urban areas whose population is 50,000 or more. If all such Urban areas were to be destroyed and appropriate steps taken to keep such areas in a state of idleness, the industrial capacity of the USSR and, therefore, its war effort could be reduced to a negligible level. As a corollary to this, if parts of these urban areas are destroyed a percentage of Soviet industrial facilities would be destroyed, and many of the skilled workers and management personnel essential to industry would be included in the over-all casualties to the population. Notable exceptions are oil refineries, electric power plants, and items of the transportation system. While it is realized that the margin of error might be

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large if applied against a small number of bombs directed at a few cities, it is considered that the variables should cancel out to reduce the margin of error to acceptable limits when the number of bombs and urban areas involved is large.

The Intelligence Division of the Department of the Army furnished this committee with measurements of 53 of the 70 urban areas listed as objectives in the initial atomic offensive of plan TROJAN. Lack of suitable maps prevented the making of accurate measurements for the others. When these measurements were made the cities were plotted on a density-per-square-mile bar graph and it was noted that all of the cities, except a few old, long-established urban centers as, for example, Moscow and Leningrad, showed a consistent relationship in population density per square mile. From this analysis it was found that a coefficient, ranging between 0.12 and 0.9 square miles per thousand people could be applied to most of the cities in the USSR. For the purposes of this report, where it was impossible to measure Urban areas from a map, a factor of 10,000 persons per square mile was used. The population of Soviet cities, as of January 1949, as estimated by the Army Intelligence Division, was used.

From the data furnished, it was possible to obtain a reasonable estimate of the Urban area and population of the cities of the U.S.S.R. having a population of 50,000 or more.

An estimate has been made as to the percentage of industry located within the TROJAN cities and the amount in other main cities. Two methods were used in determining these percentages: First, a relationship between the area of the TROJAN cities to the total areas of all cities in the U.S.S.R. of 50,000 population or more; and second, by a population ratio. It is interesting to note that these two estimates vary only by 10 per cent.

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The destruction area of each bomb was estimated as previously discussed in Appendix "G" to Enclosure "B" and totaled. A detailed study was made of each target and it was noted that the area of expected destruction of each bomb in many cases includes considerable water surface. In arriving at the total destruction area these non-productive water areas (approximately 5%) were excluded.

The estimated destroyed area divided by the total Urban area within the TROJAN cities was taken as an index of the destruction which might be expected on the Soviet industry within these cities, and of Soviet industry as a whole.

In reaching its conclusion the committee used an overpressure* of 5 pounds per square inch as a measure for the area of Class A damage.

An estimate of 20,000 persons killed per bomb was used to arrive at an estimate of the total deaths which will result from the atomic offensive. The figure of 20,000 is felt to be reasonably conservative in the light of experience at Hiroshima, and the computed population densities of average Soviet cities. Corresponding casualties to personnel by burns, wounds or other causes would be about 30,000 per bomb. These rates might be subject to downward revision depending upon the effectiveness of Soviet passive defense measures which are discussed in Appendix "F" to Enclosure "B".

AREA AND POPULATION

	<u>TROJAN Cities</u>	<u>Other Cities (50,000 or more Population)</u>
Square miles of Urban Area	1,751	866
Population	28,080,000	8,660,000

* Pounds per square inch overpressure is the pressure in the blast wave in excess of atmospheric (i.e., 4 pounds per square inch (psi) overpressure equals 576 pounds pressure per square foot in excess of normal pressure on a surface facing a blast wave, 8 psi equals 1152 pounds per square foot overpressure, etc.)

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APPENDIX "J" TO ENCLOSURE "B"AN APPRAISAL OF THE PSYCHOLOGICAL EFFECTS OF ATOMIC BOMBING UPON THE SOVIET WILL TO WAGE WAR

NOTE: In this appraisal there are many statements which to a degree balance each other. This is necessary in order to portray the complex and frequently contrasting Russian character, its history and development. Hence, the appraisal should be considered as a whole and single statements should not be considered out of context.

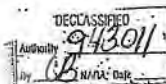
Historical Background - The "Autocratic Tradition".

The U.S.S.R. has developed from and is now composed of a large number of races, ethnic groups and former small nations. Individually and collectively, they have fought severe battles against nature, among themselves and against foreign powers. The country has been overrun by Mongols and deeply penetrated, but not completely overcome by Western European nations. The Russian people have undergone many transformations and they are thoroughly indoctrinated in autocratic traditions. The Czars introduced autocratic rule that has provided a frame for potential greatness and a prevailing unity for the Russian nation which has carried through to the present time.

The physical isolation of Russia from the trading centers of Western Europe and the world has been paralleled by her spiritual and cultural isolation. Russia as a whole has been cut off generally from the influences which have enriched the life and spurred the development of the western world. She has been associated with conditions which have influenced the development of hard, stolid and ruthless characteristics among the people and their leaders. Historically, the Russians have maintained strong armies to support their military position and, since its advent to power, the Communist government has maintained strong military forces and backed them up with an expanding program of industrialization.

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The Russians are essentially an unsophisticated, gregarious people, readily susceptible to propaganda and rumor. They are a paradoxical combination of primitive simplicity and stoic, ruthless Orientalism. In groups, once aroused, they have been capable of almost superhuman tasks. With their patriarchal tradition, the masses of the people have followed their leaders with child-like confidence and unswerving loyalty. This has not precluded the upsurge of leaders with revolutionary tendencies against the government. Russia has accomplished, and can accomplish again, political and social evolutions dangerous to world peace, provided the autocratic power is preserved, and the people remain politically passive.

The actual philosophy of the modern U.S.S.R. is something to which Karl Marx and dialectical materialism have made a contribution, but it is made up of other elements, including those of Orthodox Christianity and traditional Russian sentiment. It must be recognized that we face in the U.S.S.R. today two strong forces -- that of militant communism and that of strong Russian nationalism. Each force would have a powerful influence on Soviet actions in the event of war.

The vast mass of the Russian people have never dreamed of enjoying democracy and freedom as enjoyed by Western peoples. Their primary interests have been the problems of obtaining a day-to-day existence, and nothing more. In general, they are and have been barred from knowledge of better conditions. They desire economic security, social levelling, and the prestige of the Russian nation; and these, it seems to them, they now experience in a larger measure than in the pre-revolutionary period.

Precisely how wide and how deep was the sentiment of Great-Russian patriotism in the pre-revolution nation, it is not easy to say. Patriotism toward the State was perhaps neither wide nor deep. On the other hand, patriotism of a mystical entity, of "Mother Russia", has been consistently both widespread and

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persistent. It is exemplified by the historical shrines of Moscow and Leningrad, and the hope of many Great-Russians to see Leningrad, and to live and die in Moscow,

The Great-Russian people have formed, organized, and administered successfully certain primitive aggregations; their patriarchal family, village communes, and even larger units. Within these groups there has been complete freedom of expression, and argumentative debate, but each group has had an authoritative head. The people have normally concluded these debates without firm decisions among themselves, for decisions are considered the prerogatives of their leaders. It is immaterial to them that their democratic procedures are not translated from small organizations to the larger political bodies and to the political problems of State, since each unit, family, commune or region is traditionally under authoritative discipline and control.

In certain respects, at the present time, the Soviet government tolerates self-criticism. At agitation meetings, and meetings of factory-Soviets, considerable argument and debate on administrative matters are permitted but never to the point that the policy or decisions of the recognized leaders and the Communist Party are questioned. In Russia there are many examples of a degree of democracy on the lower plane, which might prove eventually to be the germs for democracy on the higher, the national plane. So far the mass of Russian people continue to be an amenable group who are convinced of their duty of submission to their masters. They possess a blind faith in leaders and their decisions. Even though a decision is not in accord with the peoples' wishes, they accept it with the conviction that their wishes were considered but their leaders knew what was best and have done what was right,

The Soviet totalitarian state is firmly established upon the foregoing historical characteristics with variances to permit many traditions and Czarist customs to be adapted to modern demands. Stalin enjoys prestige and a position of greatness comparable to the former Czars - their "Little White Father" in the Kremlin.

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Although not a Great-Russian, he has risen from among the working people. All decisions of the Soviet government are considered to emanate from Stalin, even though, in reality, they have been prepared and disseminated by any government agency in keeping with Stalin's policy or the directives of the Politburo and the Communist Party.

The majority of the people do not belong, and have no aspirations to belong, to the Communist Party. The Communist Party relieves the Russian people from the undesired burden of responsibility for decision and administration on matters of State.

Soviet leadership is undoubtedly in control of both government and the people, and has never seriously miscalculated what the people would tolerate. The organization for propaganda and agitation issues propaganda, but at the same time maintains through agitation meetings a unique nation-wide poll of the peoples' reaction and attitude toward government policies. The government manipulates its policies and executive action skillfully based upon this knowledge.

The Russian people currently have a standard of living that is low when compared with the West, but probably higher than the conditions existing during pre-revolutionary times. The people enjoyed a better standard of living in 1938, but were forced to abandon it to prepare for war. They submissively accept their present conditions as temporary while war damage is repaired and industrial development is attained. Their lives, in the past and present, have been eternally filled with many promises, and the people still hope that these promises will be fulfilled. The past war, and their enemies, are blamed for their present condition, while their government is loyally supported for achieving victory and taking the constructive steps to provide for their welfare.

The main themes for propaganda are developed around "fear", "hope", "love", and "hate". The Soviets use "fear" and "hope" most frequently and effectively. The Soviet regime has many sources of strength; but propaganda and force are the two dominating instruments. Propaganda conditions the people to accept and support the

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government, where force, and the fear of force, serve to keep otherwise non-conformists in line. Those who complain or fail to conform are quickly removed and re-educated.

Lessons from World War II

Russia was saved from German conquest, not by her modern progress, but rather by the vastness of her territory and the tenacity of her people. The Germans underrated the Red Army. German hopes of victory were built largely on the prospect that the invasion would produce a political upheaval in Russia. Most of the German generals realized beforehand that, if the Russians chose to fall back there was little chance of achieving a final victory without the help of such a political upheaval. Too high hopes were built on the belief that Stalin would be overthrown by his own people if he suffered heavy defeats. The Russians have proven that they can absorb heavy casualties and extensive withdrawals in the field without having it cause political overturn. The Germans paid a terrific price for their lack of foresight.

The Germans were outmaneuvered by the significant Russian custom of repeatedly giving ground rather than letting themselves be drawn into decisive battles such as the Germans were seeking. The Germans failed to assess properly the Russian mentality and to assess properly Russian psychological weaknesses.

Red Army officers and men were forced by discipline and haunted by a real fear which caused them to carry out their orders implicitly or individually to suffer the consequences. Impelled by courage, ruthlessness and stringent military and political discipline the Red Army executed its orders to retreat to hold fast, or to advance, regardless of the loss of human life. Once the Red Army took the offensive Russian troops never failed to advance, except when stopped locally and temporarily by heavy German fire, for they were driven forward under the compulsion of officers. Political representatives were ready to turn their pistols on anyone who shirked. The men were imbued with an offensive spirit. An outstanding characteristic of the Russian soldier is his soulless indifference to life and death. Red Army troops are hard, and frequently cruel in their behavior.

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German General Manteuffel described the Red Army on the offensive as follows:

"The advance of a Russian Army is something that Westerns can't imagine. Behind the tank spearheads rolls on a vast horde, largely mounted on horses. The soldier carries a sack on his back, with dry crusts of bread and raw vegetables collected on the march from the fields and villages. The horses eat the straw from the house roofs - they get little else. The Russians are accustomed to carry on for as long as three weeks in this primitive way, when advancing. You can't stop them like an ordinary army, by cutting their communications, for you rarely find any supply columns to strike."

Destruction by Bombing

Industry. The Russian people have been continuously reminded that their sacrifices since 1917 are necessary in order to permit their leaders to develop an industrial potential comparable with that of the West and to prepare for war or to repair war damage. Russians have been led to believe that their standard of living and daily struggle to survive will be more readily solved as the established industrial goals are attained. In 1937 and 1938 Russians began to taste a little prosperity. At present they are led on by the hope that real prosperity is in the offing. The loss of their industry for which they have sacrificed so much would be a real blow to their hopes and future plans for personal security. The perpetrator of such destruction might well incur all the hatred, resentment, and antagonism that Russians of the past have felt toward their enemies.

Cities. Russian history is replete with instances of a "scorched earth policy". The peoples of Central Europe consider an invading Russian Army and wanton "destruction by fire" as synonymous. Russians have readily set fire to their own cities rather than allow them to be sacked by the enemy. A good example of such action was the burning of Moscow in 1812. Of all their cities, Moscow and Leningrad house the symbols of

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autocracy and paternalism upon which they have traditionally depended for decision and direction. This has developed a degree of sacredness for these cities, which is identified with their mystical entity of national patriotism. The Russians will burn their own cities to deny them to the enemy, but the enemy who destroys their towns, villages, and historical shrines, can expect a violent reaction with the result that the people would unflinchingly rally and even accept internal tyranny in preference to any abuse by a "foreigner".

Urban Population. Among the various groups of peasants, workers, and artisans, there are many differences which are essentially petty in nature. Word of wanton destruction of urban populations would quickly spread and become exaggerated by rumor throughout the U.S.S.R. However, antagonism against the enemy would tend to develop a unity of purpose, a loyalty to the regime, and a renewed vow to defend "Mother Russia"--a spirit of self-preservation which would transcend their differences.

The bombing of seventy Russian cities as planned may have a terrific shock effect upon all the people of Russia. Subjected, or in close proximity, to this bombing would be some 28,000,000 people, approximately one-seventh of the population of Russia, with possible prospect of some 2,500,000 mortalities. Within these urban populations are the technicians and the reservoir of manpower, upon which the success of Russian industrial development depends.

On the other hand, it should be borne in mind that in World War II, Leningrad withstood a seige of two years. Public utilities did not function for months, thousands of people starved and the population as a whole survived with the meagre of consummable supplies that were indigenous to the area. Work went on in spite of starvation and bombardment. In spite of over 350,000 casualties, Leningrad never capitulated. A similar ordeal was experienced at Stalingrad and to a lesser degree at Moscow.

The "Foreigner" Complex

Russian history has been continually dominated by strong foreign influences. Since 1800, almost every generation has

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experienced an invasion" by a foreign army. Czars invited and permitted foreign "experts" to hold responsible positions in their regimes. Russian foreign policy encouraged and condoned marriages of nobility to foreigners as a means of settling international differences, and advancing the spheres of influence of the Russian empire. Prior to 1917, the Russian economy and resources were often exploited, administered, and owned by foreigners. Foreign capital was invested in Russia and the profits from these investments were distributed abroad. Subsequent to 1917, the Communist Party through propoganda has convinced the Russian people that their past sufferings were the direct result both of the Czars' ineptitude and the intentional designs of foreign capitalists. The pernicious influence of foreigners on Russian progress and welfare has been emphasized to the Russian people. To the average Russian, "Foreigner", and "Capitalist" are synonymous and repugnant.

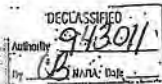
There is evidence that today those Americans who have been permitted to travel within the U.S.S.R. are received by the people in a friendly, hospitable manner to the extent that these people can overcome fear of the police. Observers also report an impression that anti-American propoganda is not as generally effective as was the former anti-German propoganda. There seems to be a noticeable skepticism regarding anti-American propoganda among the Russian people. There is apparently a considerable reservoir of friendliness among the people toward the United States residual from lend-lease activities.

Heavy and extensive bombing by the U.S. would certainly be a valuable adjunct to Soviet anti-U.S. propoganda and play into the hands of the Soviet reglme. The Russian people would more readily believe that their government has been telling them the truth, with the result that Russian resentment and antagonism would be easily developed and intensified against the United States. Their traditional suspicions with regard to "foreigners" would be confirmed and focused upon the United States.

The Communist Party and the Secret Police (MVD)

The Communist Party controls and dominates everything in the U.S.S.R. The ubiquitous secret police, assisted by agents and informers, forces complete subjugation of the people to the will of the leaders of the party.

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The MVD and their assistants permeate everything, appear to know all, and collect and maintain voluminous records about everyone, with no distinction with regard to age, class, sex, family, or official position. Within the confines of the U.S.S.R. it is a serious mistake for anyone to feel that he is not observed by the MVD. The more important the individual and the higher the position to which one is assigned, the more carefully and thoroughly is the surveillance that each individual receives. The MVD are quick and ruthless in execution of their duties.

The Politburo, Central Committee of the party, and the center of government in Moscow, are far removed from the people. The leaders of the nation are not, and must not be criticized. Appointments are made, and nominations for election to public office throughout the country are approved by the leaders in Moscow. All subordinates expect and look for guidance, directives, decisions, and orders that emanate from 'Moscow', and Moscow only.

The regional government of the Soviet Republics are in closer contact with their people. The regional administrations can be, and are criticized by the people. The nature of the criticisms usually are restricted to problems of mismanagement, and failure to execute properly the orders and decisions received from Moscow. Regional administrations authorize many community privileges as well as execute numerous governmental functions. They work slowly, but thoroughly, and are highly dependent upon decisions from the central government. They must continually strive to meet local problems, and, at the same time, to perpetrate the Moscow Party line. Their use of propaganda and force is in consonance with, and fully as severe as, that exercised from Moscow.

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The People

The People, the masses in general, exist on a marginal basis. They are interested solely in making their living, and not in participating in the complicated problems of a national or international political ideology. They are grateful to their government for whatever they may be granted. The only prospective path toward human betterment and emoluments, from the cradle to the grave, lies in qualifying, or becoming identified with and developing as a member of the Party. Even at that, Party membership is relatively small for many reasons. With poor roads, with rail as the only available means of distant travel, and with police check on every move, people are generally local in their interests and know little, except what is told them, about the outer world--perfect subjects for totalitarian propoganda.

Russian character has contradictory features. On the one hand, the Russian can be good-natured, helpful, loyal, hospitable, and trustworthy; but on the other hand, he is primitive, suspicious, cunning, cruel, brutal, and even ferocious. A Russian loves his country intensely, and is easily hurt by deprecating criticism. He willingly endures severe treatment, provided he is allowed to live his own life.

Soviet rulers are obviously aware that, while the Russians are, in the main, loyal to their own government as against any foreign government, the regime as such inspires little enthusiasm except among its direct beneficiaries. The wartime acts of Soviet rulers have shown that these rulers knew that if they were to demand from the people superhuman efforts against the invader, it would have to be in the name of Russian patriotism, and not of devotion to the Communist Party. As a matter of expediency, the Party was pushed into the background and the Army exalted. It was only when victory was in sight that the Party was restored to the foreground

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to receive the applause. The Soviet government appears to realize fully the capabilities, limitations and psychological reactions of the people under its domination.

The U.S. "Voice of America" has occasioned curious interest among the people of the U.S.S.R. and there is evidence of its widespread reception. The contents of these programs, which are in such contrast with Soviet propaganda, produce considerable mental confusion among its listeners. To the Russian there is no proof as to which propaganda is correct, and the Russian is completely incapable of imagining that many standards portrayed by the "Voice of America" can actually exist. The Russians are interested in local matters of everyday importance. Their ignorance of the outside world has made them submissive subjects for propaganda. Exposure of members of the Armed Forces to western civilization is carefully controlled and is invariably followed by re-indoctrination. Other countermeasures to enforce ideological discipline are the retention of wives and children as hostages while the husband is abroad, requiring that only married men be permitted on certain assignments and limiting their periods of such duty. Even in Russia itself, when people in industry travel to new jobs in new localities, their "service records" must accompany them, and the police are continuously aware of their movements.

There is some evidence to indicate that the Soviet regime is much worried concerning the continued loyalty of its people. The acceptance among their people of the Communist ideology may be wearing thin. To counteract this, the leaders of Communist parties abroad have been required recently to voice new "oaths of fealty" to Stalin and World Communism. There is active prosecution of programs of re-indoctrination in Communist ideology throughout Russia.

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The fairly constant trickle of Russians seeking asylum in the West further suggests that inside the Soviet Union there is not the same total ignorance of conditions of the outside world that previously prevailed among the Russian people. But, on the whole, it must be admitted that propaganda and censorship exercised by the Soviet government has a better chance to continue to reach and dominate the mass of the Russian people than has propaganda from the Western World.

Control--as widespread geographically as it is, as binding and hidden as it is; with such widespread inertia of submissiveness traditionally ingrained in the people; with doubtful ability on our part to get at the mass of the people with justifiable and understandable explanation as to our motive for so ruthlessly destroying their industry and killing their people in the hearts of their country by strategic bombing--could hardly be destroyed other than temporarily and in areas of panic and hysteria. Among the people there would certainly be the feeling that nothing their government could have done could warrant bringing such punishment by us upon them. Soviet propaganda has already laid the groundwork for this attitude. The government would immediately seize all radios in the event of war, as it did in World War II, and would be able to retain communication initiative throughout the interior of Russia. This could not be overcome until, by some means or other, the Allies established dominating ground control.

Resistance Elements

Resistance groups have never seriously threatened the Soviet government's control of any large area, although they have caused occasional disruption of normal activity in various districts of the U.S.S.R., such as the Crimean and Ukrainian movement after World War II.

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Police countermeasures are usually very effective and expeditiously executed. Planned genocide and forceful transfers of population, resettlement, and similar dispersals of the ethnic groups involved, has been pursued effectively by the government in almost every case of dissidence or defection among national entities. In most instances, these ethnic groups have been more concerned with survival than political ambitions.

The composition of recalcitrant bands is heterogeneous, with the membership including many escaped PW's, Soviet Army deserters, criminals, and political outlaws, who are generally more concerned with their own survival than with political aims. Militarily impotent in their isolation and politically uninterested, these groups are too small and too poorly organized to assume control of their own national area, let alone the government of the entire country. They would represent a liability rather than an asset in the establishment of a new Russian government after a collapse of the Soviet system.

On the basis of available evidence there is neither an organized, nor a projected underground movement in the U.S.S.R. None can be expected to develop in a country where the ubiquitous MVD permeate every phase of life and its most personal problems. Under this system an underground can only be nurtured among groups of the MVD or within the Red Army Forces. Within these organizations, in the past, isolated cases of defection have developed, but subsequently have been destroyed with immediate drastic purges. There are no signs of deterioration within the Armed Forces or Soviet police at the present time. Political administrators within the Armed Forces are alert to detect any evidence of defection; and their surveillance is very efficient and effective.

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Resistance elements require capable leadership and careful planning. There is little opportunity to groom leaders within the U.S.S.R. for resistance activities. "Foreigners", Russians living in exile, or Russians contaminated by "Foreigners" are the only potential sources that are available for leaders. However, Russians living in exile have lost close contact with internal Soviet conditions, and they can be considered as no longer acceptable as leaders to the Russian people who have remained "at home", worked, and sacrificed with the aspirations of establishing a new "Mother Russia" as one of the dominant nations of the world.

The Combat Forces

If invasion by the Russians into Western Europe or the Middle East is initiated preceding or coincident with mass bombing of the interior of Russia, there are several important factors to be considered. First, the stockpiled military supplies within the perimeter of Russia or in satellite countries will not have been destroyed by the planned atomic offensive. Second, reports of widespread damage to industries, cities and people within the Soviet Union will be slow in reaching the combat forces through their own channels. Reports resulting from allied efforts will initially be discounted by Russian control elements and represented to be exaggerated or war propaganda. Third, the Soviet forces will have been committed to invasion and the lucrative prospects of conquest will be tempting. Fourth, Party representatives for execution and establishment of political control are ever present with invading forces.

It is possible that with time some defection might occur among Soviet troops, and on some fronts there might even be mass surrender of troops and people such as in White Russia and the Ukraine during World War II. However, it would appear

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that realization of ultimate lack of strength and shortage of military supplies would be slow in penetrating to troops at the front. Considering their practical, ruthless, stoical and realistic nature, and their susceptibility to propaganda from their own official sources, it appears doubtful that mutiny would occur. Their "neechevo" (nothing matters) attitude, coupled with political control, should prevent initiative on the part of individuals to the extent required to stimulate mob action. It is quite possible that the realization of the extent of destruction being inflicted within their own country, combined with Soviet propaganda, would spur them on in an attempt to gain control of European economy more rapidly, as their ultimate prospect of salvation.

A balancing factor which should also be considered is the influence on the Soviet High Command of prospective shortages of essential military supplies and logistic means for the support of planned combat operations. It must be realized that the Soviet Army would operate in accordance with directives of the Politburo. This agency would be quick to re-estimate the situation in the light of damage being inflicted on Soviet industry by the atomic offensive. Advice by the military might or might not be considered by the Politburo in such an evaluation. In either event, it is probable that the Politburo would be forced to come to the conclusion that it would be necessary to postpone or even abandon, at least temporarily, certain planned operations, and to modify the strength, direction and objectives of their main invasion efforts. It would appear that decision as to how far the combat forces would be permitted to advance would be predicated on a combination of military and political interests.

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Satellite countries of the U.S.S.R. are not targets for A-bombing in the contemplated plans. Disaffection toward the U.S.S.R. is very prevalent, much deeper, and more widespread in the satellites than within the U.S.S.R. Underground movements, and subversive activities in various stages of development exist in every satellite.

The people of the satellites are now, and in event of war would be, accessible and to a considerable degree amenable to Allied news and comments. They have had sufficient contact with, or have been previously oriented to, the "Western World", therefore, they are more understanding and tractable with respect to the Allies and their objectives. Rather than possessing an inertia toward "liberation" the mere hope of being able to cast off the yoke of the U.S.S.R. would undoubtedly generate many overt acts to allied advantage, as the satellite people become aware of the possibility of their prospective release from bondage. These people are experiencing daily trials and tribulations under political oppression dictated from Moscow. The Communists, although a minority group in each satellite, maintain control using the tactics of the Kremlin. Large numbers of satellite citizens, particularly from Poland and Czechoslovakia, have been outside the confines of the U.S.S.R. sphere of influence. Some have refused to return to their own country, while others have done so reluctantly with a hope that "liberation" from the Soviet yoke may soon be achieved.

In general, these people desire liberation. Nevertheless, they fear the ravages of a war. There is an atmosphere of fear and anxiety among the people who are gradually being reduced to a standard of living comparable to that of the U.S.S.R. When and if liberation comes, these people will require guidance and leadership not only in world affairs but also on domestic problems.

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Considerable evidence exists to support the thought that, upon receipt of reliable reports of the destructive bombing offensive within the U.S.S.R., these people will instigate widespread sabotage, and that guerrilla movements will arise throughout the area. The destruction and confusion thus wrought would materially hamper the Soviet invasion effort.

The degree and rate at which these activities would affect the morale of the Russian invasion troops, or would penetrate by seepage back into the U.S.S.R. itself, with possible effect upon control in such areas as the Ukraine, the Baltic States, etc., is a question which is so balanced by factors of the moment that it cannot be judged at this time.

Shock (Psychological Effect of A-Bomb)

There is marked contrast between the effect of the bombing offensives of World War II and the intense shock and psychological effect to be expected from the atomic offensive as presently planned. The former consisted of a progressive type of bombing build-ups with several shifts in general objectives, bombing patterns and some promiscuous raids. The latter provides for concentration upon industrial capacity within some seventy principal U.S.S.R. urban areas, with consequent damage to the people of those areas, within a period of 30 days.

It is possible that the shock and psychological effect would be so thorough and crippling, as to nullify temporarily all the factors previously discussed. Certainly temporary numbness, frustration, chaos, confusion, and despair would be prevalent. Panic, and possibly considerable hysteria might be expected to develop. Once news of the effects of bombing has been established as factual, the fear of similar bombing would be generated in other industrial centers. This could precipitate a mass exodus of workers from such areas or

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at least cause considerable confusion and loss in productive potential. Rumor and gossip once initiated would probably exaggerate actual damage and chaotic conditions, and in due time it would spread to all sections of the U.S.S.R. without being completely stifled by government and MVD countermeasures.

The U.S.S.R., with its relatively new industrial structure, can ill-afford to lose its skilled workers, technicians, foremen, plant managers, and industrial administrators. Technicians, and plant managers appear to be among the weakest links in the U.S.S.R. industrial structure. The majority of these key personnel, indispensable to vital industries, are located in the urban centers now potential targets of the bombing offensive. A large percentage of key personnel might be killed or scattered by the direct effects of the bombs and the resultant conflagrations. Their families as well might be largely destroyed or disintegrated by maiming, death or flight. Death and major casualties might amount to as many as five million people, who are now concentrated in the selected target areas.

Although these seventy urban areas are few when compared with the total number of cities and towns in the U.S.S.R., nevertheless, they are critical industrially, and widely scattered geographically and contain 28,000,000 people. Rumors and stories, readily exaggerated by repetition and travel, would have some effect and could augment fear of further bombing of anything and everything deemed by the people to be critical or of military value. The 28,000,000 people exposed in the seventy cities, about one-seventh of the population of the U.S.S.R., would have experienced personal contact with the effects of the bombing.

It is a rather ghastly picture--for the moment--as we imagine the prospect of bringing about a possible liquidation of the Politburo, and the Communist hierarchy, even though such liquidation is highly improbable. One of the major fears of

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the Politburo is a defeat in war and their subsequent forced capitulation. It is this fear that drives them to greater excesses against their own people. Should a capitulation of the Communist hierarchy materialize, the degree of change in the ingrained attitude of the Russian people toward "foreigners" is very problematical. There is sufficient reason to believe that their immediate resentment would be intense; it might require the efforts of the Allies for generations to overcome this resentment and antagonism.

Even should this extreme result be approximated, what in reality actually would be accomplished? In essence, time* would be the principal immediate gain: time* in which to build up stronger Allied resistance to any Soviet invasion efforts; time* in which to organize and implement Allied ground offense with less interference from the Soviet; time* in which to initiate the establishment of Allied controls of some sort. Assuming that the U.S.S.R. may be temporarily rendered materially incapable of offensive action, while its people are in a bewildered, frustrated, and despairing mental condition, these factors must be considered:-

a. Its people will have been deprived of that which has provided them the meagre margins of livelihood which they have so far been able to possess at great personal sacrifice.

b. Neither the roots of Communist ideology nor the instruments for its perpetration--propaganda and force--will have been destroyed.

c. Communism thrives where chaos and confusion reign.

d. In the philosophy of Communism, the end justifies the means, and time itself is no object in the final accomplishment of Communist aims.

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Counteracting factors which would diminish the severity of such an extreme situation are intensive defensive training and propaganda programs within the U.S.S.R., the extensive police control and the stolid characteristics of the Russian people.

In reality, it appears that a situation will have been created which is susceptible of ultimate development in one or a combination of possibly three ways:

a. Complete anarchy in the absence of any dominant central control, or into feudal states based upon surviving regional control elements;

b. Reconstitution of the communist state, based upon surviving elements of the present central and regional governments and operating centrally from an undestroyed locality;

c. Amenable or cooperative effort in certain U.S.S.R. areas toward types of government of the peoples' own choosing in accordance with Western Allied objectives. This development presupposes interim allied ground control which would need to be established immediately subsequent to the bombing (before Soviet controls could be reinforced), and which would be capable of implementing its objectives and procedures among an initially suspicious and largely resentful people, masses of them harassed by hardship and starvation.

Conclusions

The Committee concludes that successful execution of the initial atomic offensive, as planned, will have the following psychological effects on the Soviet will to wage war:

a. It would seriously disrupt temporarily, and impair indefinitely, the mechanisms of civil and military control.

It probably would not destroy the roots of Communist ideology or critically weaken the power of Soviet leadership to control and dominate the people.

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b. It would not turn the majority of the people against their government but would, in general, unify them and intensify their will to wage war. It would validate in the minds of the majority Soviet propaganda with regard to the intentions of foreigners to destroy the U.S.S.R. Intensified resentment would persist for an indeterminate period.

c. The will of an indeterminate minority to wage war will undoubtedly be weakened and certain elements will attempt to take advantage of the situation, but neither of these influences would be likely to develop to such an extent as to produce critical effect upon the total Soviet war effort.

d. Temporarily, it will create a widespread chaotic situation among the people, particularly in the urban areas. This situation may well cause a high degree of absenteeism and disorganization in industries essential to the war effort. This would force modification of Soviet invasion plans, and, in time, adversely affect the morale of the Soviet armed forces.

e. It will create within the U.S.S.R. a psychological crisis which could be turned to advantage by the Allies through early and effective exploitation by armed forces and psychological warfare. Failing prompt and effective exploitation, the opportunity would be lost and subsequent Soviet psychological reactions would adversely affect the accomplishment of Allied objectives.

f. Any demoralizing effect among Soviet invasion troops will be of a delayed nature and will be dependent upon the fruits of their early invasion efforts.

g. It would open the field and set the pattern for all adversaries to use any weapons of mass destruction and might be expected to result in maximum retaliatory measures within Soviet capabilities.

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h. As reports of results of the atomic offensive reach the people of Soviet satellite countries, both their sabotage of Soviet control and military effort and their partisan cooperation toward Allied objectives can be expected to increase with the hope of throwing off the Soviet yoke.

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APPENDIX "K"

EFFECT OF THE INITIAL ATOMIC OFFENSIVE AGAINST THE
 U.S.S.R. UPON THE SOVIET ARMED FORCES

1. General

In Plan TROJAN and supporting current intelligence estimates, the U.S.S.R. is credited with capabilities and intentions which would involve early rapid advances into extensive areas of Western Europe, the Middle East and the Far East. Such operations are portrayed as being generally concurrent or phased to be in consonance with logistic capabilities (Refer to Appendix "E" to Enclosure "B"). Principal reliance for the success of these advances is placed upon the Soviet Army supported by the Navy and Air Force, although there would be operations of more independent nature performed by the latter two services. These would include submarine and mine warfare against Allied sea communications, air defense of the U.S.S.R. and offensive air operations against the United Kingdom and, to a limited degree, against the United States.

2. The Soviet Army

a. It has been judged generally that the Soviet Army is, at this time, the most powerful in the world. Intelligence estimates indicate a strength of 2,500,000 men with 27 to 28 million males in the U.S.S.R. fit for military service, of which probably 11,000,000 are presently trained. Both in personnel and equipment, it appears that the Soviet mobilization potential far exceeds estimated requirements for the operations envisaged to be necessary for the attainment of their objectives. In character of organization and equipment, Soviet trends have been strongly toward greater mobility and fire power, with augmentation of motor transport, armored forces, tanks, and self-propelled artillery.



These trends will place greater dependence upon fuel and heavy industry within the U.S.S.R. Continuous training has overcome disruptive post-war effects and enhanced the readiness of combat and logistic support elements.

b. Intelligence estimates show that in most categories of weapons and basic equipment the Soviet Army is well supplied and that stockpiles of basic equipment and consumable supplies are located in border areas or satellite countries for intended campaigns. As to industrial support of its armed forces, the U.S.S.R. includes three important industrial areas, viz, Russia proper, the southern area comprising the Ukraine and Transcaucasia, and Eastern Siberia -- each, in general, sufficiently integrated and self-sustaining to support military operations from those areas. This results in wide dispersion of industry and serves to ease the burden from railroad lines connecting these large and widely separated areas. While the distribution of stockpiles, and their level in many instances, is unknown, considered estimates show that in tanks, guns, vehicles, food and ammunition, available supplies are adequate to support the forces estimated to be required for the duration of operations necessary for each campaign in Continental Europe, the Middle East and the Far East. These estimates are predicated on expenditures and wastage likely to be experienced in combat with Allied or indigenous forces which could be brought to bear in time. Arms and equipment, either with the armed forces or in supply dumps will not be affected by the initial atomic offensive, as planned.

c. The item estimated to be most critical from the standpoint of the Soviet Army is fuel for vehicles, tanks and self-propelled weapons. The initial atomic offensive will materially reduce production of these fuels within the

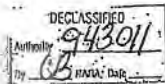
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U.S.S.R. (Refer to Annex "A" to Appendix "I" to Enclosure "B"). The actual level of Army stockpiles is unknown. With increasing emphasis on fire power and mechanization, petroleum requirements for the Soviet Army will increase more rapidly than the capacity to satisfy them. Minimum fuel requirements for the Soviet Army in Western Europe can be met partially from Roumanian fields. These sources are not presently targets for the initial atomic offensive. If Soviet forces overrun the Middle East they may obtain partial alleviation of fuel shortages by exploiting oil from that area even assuming Allied damage to refineries or interdiction of sources. By and large the supply of motor fuel is expected to become critical and should force the U.S.S.R. to be extremely parsimonious in their use of motorized equipment.

d. The most critical rail transportation bottlenecks in movement of supplies to the west are twelve rail transshipment points along the western border of the U.S.S.R. These points are not targets for the initial atomic offensive as planned. Critical transportation centers in cities within the U.S.S.R. would be disrupted temporarily, however, by the atomic bombing and much damage would occur to railroad equipment and repair facilities. This would interfere with mobilization and would slow down shipments of troops and supplies to the armed forces. (Refer to Annex "G" to Appendix "I" to Enclosure "B").

e. Tactical air support for the Army plays an important and extensive part in Soviet military doctrine. The initial atomic offensive will inflict severe damage on the Soviet aircraft and aircraft engine industries and to refineries for high-test aviation gasoline. (Refer to Annexes "A" and "D" to Appendix "I" to Enclosure "B"). This damage will quickly force the Soviet command to be highly selective and to reduce drastically commitment of aviation for ground support.

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f. In the longer term, the Soviet Army should be increasingly handicapped by the shortage of various critical items occasioned by the damage from atomic bombing in the USSR, by interruption of transportation and interference with organization for production, logistic support and flow of trained replacement personnel. These effects, in conjunction with the shortage of motor fuel and air support, will progressively diminish the effectiveness and particularly the mobility of the Soviet Army. The time at which the diminution in effectiveness and mobility occur is going to depend on the attrition from resistance encountered in campaigns as well as from the effects of the atomic offensive on the USSR.

3. The Soviet Navy

a. The strength, composition and deployment of the Soviet Navy are set forth in detail in ABAI-5. Surface, air and submarine elements are assigned to fleets in three major geographical areas: The Baltic-Arctic Seas, the Black Sea and the Far East. These fleets are generally balanced as to composition although the forces in Northern Europe and the Far East are each about twice the size of those in the Black Sea. Over-all strength is comprised of 15 large ships, 123 light combatant ships, 2000 miscellaneous landing craft and minor combatant types and about 275 submarines. The Soviet Naval Air Force has about 2400-3000 planes. Personnel strength of the Navy is approximately 600,000, including 275,000 coast defense troops. On mobilization, personnel strength would probably increase to 800,000 men. Significant augmentation of combatant ships, except for submarines, is likely to be impracticable in the early phases of a war.

b. The principal tasks of the Soviet Navy would be first to support the Soviet Army in its campaigns and in defense of the USSR; and second, to interdict Allied sea communications

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with submarines and mines. In initial operations against Turkey and Scandanavia, and to a lesser degree in the Far East, much reliance would be placed on the Navy to transport, cover and support the Red Army. Thereafter requirements would continue to develop for patrol, escort of shipping, mine laying, mine sweeping and defense against Allied naval operations. The seizure of islands in the Mediterranean, or major undertakings against the British Isles, Spain or Iceland, would impose heavy demands on the Navy. The Soviet submarine force is potentially formidable and, if advantage is taken of German assistance, offers the USSR possibility of lucrative returns for minimum commitments of resources, by aggressive warfare against shipping vital to the whole Allied military, economic and strategic position. Fuel requirements for such operations are estimated to be only about 50,000 metric tons per year -- a relatively low expenditure. Operating bases are easy to disperse. World War II experience showed them to be difficult to destroy. Submarine building facilities are relatively small and also capable of separation, dispersion and concealment. Much of the machinery involved in their construction is difficult to destroy.

c. The principal effect of the planned atomic offensive on the Soviet Navy would be to produce very critical shortages of fuel for surface forces in the Baltic-Arctic and Far East areas, probably forcing a drastic curtailment of such operations. On the other hand, accorded proper priority in allocation, fuel should be adequate to permit unrestricted operations of Soviet submarines. The Soviet Naval Air Force would be forced to be discreet in its employment due to the general shortage of aviation gasoline. This would interfere with their participation in aerial mining. In the longer term, the Soviet Navy would also be affected by damage to shipbuilding

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and ship repair facilities, and by the interference with production of electronic equipment, weapons and consumable supplies -- although, the results would be in no way decisive.

4. The Soviet Air Force

a. The Soviet Air Force is estimated to be composed of some 15,000-17,000 planes of all types, supported by about 500,000 personnel. The aircraft are distributed as follows:

9,000 - 10,000 in Tactical Air Armies

1,800 Fighter Defensive Force

1,800 Long Range Force

2,400 - 3,000 Naval Air Force

These forces are believed to be capable of expansion to a total of 20,000 aircraft with supporting personnel of 1,500,000 within six months after mobilization.

In addition to the above, the USSR has a semi-military air organization -- the Civil Air Fleet - which may contain some 1,000 to 1,500 medium transport planes and some 2,000 light communication types. It is believed that in time of war 250-500 of these might be made available for military purposes.

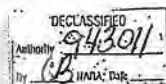
Central control of the Long Range Force and the Civil Air Fleet would provide a degree of operational flexibility in that these forces might be directed to either the Western or the Middle East front.

It has been noted that, in airborne operations, air lift capacity rather than trained troops would be a limiting factor.

b. The principal tasks of the Soviet Air Force in event of war in 1949 are considered to be: First, to provide the air defense of the USSR; second, to support the advances of the Red Army; third, to conduct independent offensive operations against the United Kingdom and, within capabilities, the United States.



c. As in the case of motor fuel for the Soviet Army, reduction and consequent shortage of fuel and lubricants for the Soviet Air Force would be a major effect of the Allied initial atomic offensive, as planned. Also, present stockpiles of aviation gasoline, especially high test gasoline, are limited and the flow time from refinery to consuming forces is believed to be very short. (Refer to paragraph 2 e of this Appendix and Annex "A" to Appendix "I" to Enclosure "B"). Principal production of high test fuel remaining after the initial atomic offensive would be in Roumania. This source is not presently a target for the initial atomic offensive. Shortages in the Middle East might be alleviated by tapping local sources on an expedient basis, if refineries there are destroyed or interdicted by Allied action, with complete alleviation of shortage if they are not destroyed or interdicted. Appraisal indicates that it should be possible for the USSR to meet fuel requirements for jet aircraft from sources which would continue to be available to them modified to the extent that crude first cut refining on an expedient and inefficient basis might be possible. By and large, the shortage of aviation fuel will become critical to the Soviet Air Force with present known stockpiles, within the second month of war. This will force the Air Force to be extremely discriminating in the employment of its Air Forces -- for training, combat and support missions. Allocation of priority for air defense would probably force drastic curtailment of supporting operations for the Red Army and Navy and reduction of the employment of the Long Range Air Force. It is unrealistic to attempt to define precisely the time at which shortage of products, particularly petroleum, will actually result in critical reduction of the capabilities of Soviet Armed Forces. The time would depend on many conditions, some of which are unknown or on which information is inadequate,



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others of which are variable or Subject to Soviet control. Among the factors which would be of major importance are the level and location of stockpiles at the initiation of hostilities; the refining capacity, damage to petroleum production and stockpiles; adequacy of transportation; ability to restore damage, adopt expedient refining processes or exploit captured resources; and especially the scope of operations and expenditures of fuel for each operation.

Estimates based upon agreed appraisals of Soviet petroleum stockpiles at the present time, petroleum expenditures and damage to refineries that would result from completely successful execution of the initial atomic offensive, indicate that fuel shortages would be critical within the first few months of the war. On the other hand, available intelligence indicates that the USSR now has three times the productive capacity for fuel and aviation gasoline above what the Strategic Bombing Survey shows Germany to have had at any time during World War II. This fact should be made the subject of careful analysis.

d. Past wartime experience has demonstrated incessant demand for delivery of new and improved types of aircraft. This would be particularly true and necessary in warfare against the United States with its engineering and industrial capabilities for rapid development. Attrition among the 15,000-17,000 Soviet planes now available would be rapid. Successful execution of the initial atomic offensive, as planned, will inflict such severe damage upon the aircraft and aircraft engine industries as to reduce the flow of replacement aircraft below requirements and to force a progressive curtailment of air operations.

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5. The Armed Forces as a Whole

a. Lack of supplies and such reports of destruction, damage and upset conditions, as may reach invasion troops will adversely affect morale. However, any demoralizing effects will be of delayed nature and the degree will be dependent upon the fruits of their early invasion efforts.

b. Serious disruption and impairment of civil and military control, damage to transportation facilities and other effects of the initial atomic bombing will render command and logistical operation, particularly from and through the seventy target cities, immediately but temporarily, exceedingly difficult.

c. Central civil authority and military command will immediately be forced to:

(1) Determine and evaluate the extent and degree of material damage accomplished;

(2) Determine existing short range and long range military and supporting economic capabilities;

(3) Modify all of those existing plans and operations (to many of which forces will have already been committed) which did not take into full consideration the prospect of the existent destruction and psychological effects of the atomic offensive. This would involve re-evaluation as to attainable objectives and ability to consolidate and sustain thereon, determination of scope, strength and direction of major and minor campaigns in accordance with existing capabilities, and preparation of appropriate supply and logistical plans for each of these.

(4) Issue modifying or completely changed orders to commands (many of which have already been committed to action), and to all military and economic supporting activities.

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It is impossible to predict exactly what decisions would be made; what the Soviet ability to put new plans into operation would be; and the degree of resulting demoralization upon the Soviet armed forces. In any event, the initial atomic offensive would force the Soviet high command quickly to re-estimate their strategic position and make important decisions regarding operational plans under difficult circumstances and without accurate knowledge as to Allied ability or intentions to accomplish further drastic destruction within the USSR. It is probable that such decisions would involve limiting, postponing, or abandoning certain campaigns which might otherwise be undertaken.

6. Conclusions

Successful execution of the initial atomic offensive, as planned:

a. Would not, per se, seriously impair the capability of the Soviet armed forces to advance rapidly into selected areas of Western Europe, the Middle East and Far East, but capabilities thereafter in those extended areas would progressively diminish due to the following:

(1) The supply of petroleum products of all types will rapidly become critical to all branches of the Soviet armed forces, with principal effects of:

Greatly reducing the mobility of the Army.

Reducing the scale of operations of the Soviet Navy and merchant shipping, although submarine warfare would probably be unaffected.

Seriously reducing Soviet air operations, involving training, transport, support of ground and naval forces, and independent offensive action, although proper allocation of fuel would allow continued operations by air defense forces.

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NOTE: The point at which capabilities of Soviet Armed Forces would diminish to a critical degree would depend upon many variable or unpredictable factors, most important of which is the level of stockpiles prevailing at the initiation of hostilities.

b. After consumption of initial stocks of basic equipment and consumable supplies, progressive shortages in a wide variety of items, particularly aircraft, would handicap operations and affect morale of the Armed Forces.

c. Logistic support would be handicapped due to disruption of planning, impairment of controls, damage to industry, and interference with transportation.

d. The Soviet High Command will be forced quickly to re-estimate their strategic position and make important decisions regarding operational plans under difficult circumstances. They would probably limit, postpone or abandon certain campaigns, but it is impossible to predict what specific decisions would be made.

e. The atomic offensive would open the field and set the pattern for all adversaries to use any weapons of mass destruction and result in maximum retaliatory measures within Soviet capabilities.

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