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ATOMIC WEAPONS REQUIREMENTS STUDY FOR 1959 (U)

SM 129-56

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TOP SECRET

STRATEGIC AIR COMMAND

(U) ATOMIC WEAPONS REQUIREMENTS STUDY FOR 1959

(SM 129-56)

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I. INTRODUCTION

1. Authority. This "Atomic Weapon Requirement Study" for 1959 (in 22 copies) is submitted pursuant to JCS Directive SM 129-56, dated 15 February 1956 and JCS Message 395095, 162849 March 1956.

2. SAC Concept.

a. Mission and Tasks. In the event of general war, the mission of the Strategic Air Command is to conduct global strategic air warfare in support of US national and military objectives utilizing atomic and nuclear weapons. In view of the growing Soviet threat to the US and its Allies, as well as the increasing Soviet capability to launch an atomic offensive against them, the accomplishment of the SAC mission must be realized through the execution of the following tasks, in the order indicated.

(1) Win the Air Power Battle by Destroying SovBloc Air Power.

(2) Destroy Systematically SovBloc War-Supporting Resources.

b. Targeting. As currently defined by the JCS, strategic air warfare includes, among others, the BRAVO, ROMEO and DELTA objectives. These objectives are basic and valid. However, they influence the selection of targets to the extent that one might infer a compartmented and sequential approach toward targeting. In view of the rapid, ever-increasing Soviet threat and capability to wage atomic warfare against the UNITED STATES, a re-orientation in thinking and planning is required, particularly in terms of the greatly compressed time factor which vitally affects the attainment of these three basic objectives.

The SAC targeting philosophy for the Air Power Battle, recognizing this compression in time, encompasses all targets that support directly the enemy's Air Power capability, i. e. :

(1) SovBloc Air Forces in being on the ground, and if possible, in the air, including:

(a) Atomic forces.

(b) Defense forces.

(c) Tactical forces.

(2) SovBloc air bases, launching sites and depots.

(3) Atomic stockpile sites.

(4) Military and government control centers.

(5) SovBloc air industry and resources that directly support the enemy's air capability.

It will be noted that all three of the basic objectives - ROMEO, BRAVO and certain elements of DELTA - are included in these Air Power Battle Categories.

Once the Air Power Battle has been won, then and only then can the emphasis be shifted to the secondary tasks. Systematic Destruction of the remaining SovBloc War-making potential. This is accomplished by attacking a selected series of the remaining DELTA targets and target complexes which contribute most to the enemy's war-making capability and which to the greatest degree his ability or will to wage war. It is here that the enemy's basic industries are brought under

attack, and the final blows are brought to bear against his economic base and his remaining government structure, with attendant physical, sociological and psychological effects.

c. Target Selection. The SAC Concept of targeting establishes the general priorities of selected targets within the system. In the Air Power phase of the campaign, all important airfields or launching sites and all other air power categories of targets are brought under direct attack. Those targets or target complexes that do not have a direct bearing on the Destruction of SovBloc Air Power objective are part of the Systematic Destruction objective. The importance of the latter is not minimized, although emphasis on it is only secondary during the opening phases of the war.

In consonance with the general precedence established by the tasks enumerated above, the considerations governing the selection of targets and further refinement of their importance are based on the following criteria:

(1) Nomination of USSR-Communist CHINA targets responsive to the task of destroying the enemy's air power.

(2) Nomination of targets in the Soviet Satellites, that are responsive to the task cited above.

(3) Nomination of USSR-Communist CHINA targets responsive to the task of systematic destruction of the enemy's war-making potential. These targets are those that are basic to the functioning of the enemy's economy and industry.

(4) Nomination of targets in the Soviet-Satellite areas, that are responsive to the task mentioned in the preceding sub-paragraph.

The priorities within each of these groups vary according to the latest intelligence data. However, current war plans of this command reflect current priorities for attack, in consonance with the basic SAC mission, concept and priority groupings mentioned above.

Within the scope of the targeting philosophy outlined above, this command's grouping of targets differs from the divisions listed in paragraph 9 of the Appendix to SM-129-56. This is based primarily on the consideration that the most important task for the 1959 conflict - the winning of the Air Power Battle - encompasses many categories of targets other than aircraft and airfields. For example, key control centers, atomic stockpile sites, POL storage sites, and air depots are all considered to fall in the priority category of air power battle targets.

For the purposes of this study, however, the SAC target system has been broken out in the tabular presentations according to the target divisions listed in paragraph 9 of SM-129-56. This breakdown was impossible in the target listings, due to their unwieldy size as well as to EAM limitations; however, a category code listing has been included, by means of which the category of any target in question may be readily determined.

3. Scope of Target System and Justification of Targets.

a. Scope. The target system presented in this study is in line with previous SAC estimates and within the bounds of the size of the target system anticipated by AIE 10-2 (proportioned from 1961).

FOR PART I of this study:

(1) AIE 10-2 estimates (1959):

4500 target areas
5975 targets, of which 1802 are BRAVO, 938 DELTA

(2) SAC Target System

2345 DGZ's (actual)
1055 DGZ's (on basis of projected intelligence)
3400 DGZ's total

The SAC system allows for SAM sites, radar sites (which are not included in AIB 10-2), and on-call targets, as well as some ROKEO targets from the AIB 10-2 system. A breakdown of the Part I target system and DGZ's appears on pages 10-11 .

FOR PART II of this study:

[redacted] A breakdown of the PART II target system and DGZ's appears on page 1 .

t. Justification.

(1) SAC Targets. All targets, the nature of which may be described by any of the Category Codes listed on page 154, and which are responsive to either of the two tasks cited in paragraph 2a, above, are included in this study and constitute the SAC target system.

The great majority of targets will be programmed for strike by SAC in accordance with mission objectives and operational considerations. Most of these targets lie in areas accessible only to SAC. Additionally, other targets may be struck by SAC for another commander whose delivery capability during the time period may not be adequate in terms of range.

Justification of each individual target is based on its priority number; this, in turn, tempered by some operational considerations, determines the type of weapon applied. It is to be noted that some low-priority targets have weapons allocated to them only because of the expressed desire of other commands.

(2) Duplicated Targets. During coordination of this study with the other JCS unified and specified commands, it was mutually agreed by all the command representatives that some duplication of effort on high priority Air Power Battle targets would be both desirable and necessary. Such duplication increases the assurance that the target will be destroyed if one command is unable to strike or if the degree of damage on the first strike is less than expected. Every effort was made during the coordination conferences to keep such duplications at a minimum and to restrict them to high priority air power battle targets. These duplications are clearly indicated in the target lists, and it will be noted that they are largely confined to high priority airfields.

4. Factors.

a. Force Structure. Size and composition of the force considered for 1 July 1959 is in consonance with the Joint Mid-Range War Plan for 1 July 1957 (SM 344-55), as revised by data included in WPR 58/59-2 of 15 February 1956. Although there have been recent further revisions to this force structure, these revisions will not materially change the weapons requirements of this study. The force consists of:

AIRCRAFT	
TYPE	NUMBER
B-47	1260
RB-47	225
B-52	495
F-101	150
Sub-Total	2130

MISSILES	
SNARK	64
RASCAL	60
CROSSBOW	72
IREM*	180
Sub-Total	376
TOTAL	2506

*Although the IREM is not included in EM 344-55 or WPR 58/59-2, it has been assigned to SAC on a priority basis since the publication of these documents, and will be available in the time period of this study.

b. Operational Factors. These factors are based on a close analysis of aircraft performance reliability over a period of time, validity and accuracy of target intelligence, vulnerability nuclear validity, yield of weapon, and certain assumptions concerning duds, attrition, aborts and reliability (missiles). Judgment based on these data and experience led to the following factors:

OPERATIONAL FACTORS

(1) For BRL Computations

	AIRCRAFT		MISSILES				
	POINT TARGET	AREA TARGET	CROSSBOW	RASCAL	IRBM	SNARK	ICBM
Weapon Yield and CEP	[redacted]						

(2) For Total Requirement Computations

	AIRCRAFT	MISSILES						
		CROSSBOW	RASCAL	SM-75 IRBM	SNARK	[illegible] ATLAS	[illegible]	ASM B/S
Gross Error	[redacted]							
Duds								
Pre-Target Attrition								
Aborts								
Reliability								
Base Loss								
Average Factor								

*Based on performance similar to B-47.

a. CEP.

(1) Manned Bomber: 3000' All-weather

(2) Fighter : 600' Visual

(3) CROSSBOW : 580'

(4) RASCAL : 2 NM

(5) IRBM : 2 NM

(6) SNARK : 2 NM

d. Reserves. This command maintains no "reserve" weapons purely as such. The reserve weapons requirement shown in this study (see pages II-14) is for actual programming against "Projected DGZ's" which cannot be programmed today. In this category, some DGZ's are protections based on Intelligence estimates, while others are currently existing DGZ's which are not yet precisely located. Neither in Part I nor in Part II are specific reserve weapons assigned to specific targets or name places.

5. Weapons

a. Selection. The following stockpile configuration is compatible with the force structure envisaged for 1957 on the basis of information in Annex "B" to Appendix of SM 129-56 and WPR 58/59 (Joint Mid-Range War Plan - 1957):

WEAPON	B-47	RB-47	B-52	P-101	SNARK	NAVAL	CROSSBOW	IRBM
MK 6 B	X		(X)					
MK 6 C	X		(X)					
MK 28		X		X				
MK 27	X	(X)	(X)	(X)		X		
MK 15	X		(X)		X			
MK 36	(X)		X					
W-35								X
W-37							X	

X = Primary Carrier

(X) = Alternate Carrier

b. Application. Every effort has been made to adhere to the following general guide lines in applying the most appropriate weapon to a given target:

(1) Highest yield weapons are programmed for Air Power Battle targets to ensure satisfaction of damage criteria, to provide for economy of force, and to reduce operational requirements (i. e. sorties) to a minimum. Among these Air Power Battle targets are: airfields, launching sites, controls, air industry, atomic industry and stockpiles, missile sites.

(2) In the situation above, every effort has been made to restrict the use of high yield weapons on Air Power Battle targets in the European Satellites in consideration of political, psychological and offensive-defensive implications, provided damage criteria and economy of force are maintained. To this end, high yield weapons have been applied only against airfields in the European Satellites.

(3) Generally, atomic weapons are assigned to Satellite targets.

(4) Multiple weapons and compound effects are desired only to the extent that damage criteria are satisfied.

(5) Generally, each airfield target constitutes one DGZ.

(6) Atomic weapons generally are assigned to targets in the Systematic Destruction category.

c. Damage Criteria. The SAC targeting concept is based on the well-accepted probability that the Air Power Battle will be so compressed in time that a favorable decision may be reached in the initial stages. This dictates maximum effectiveness (mass and concentration of fire power), economy of forces (minimum sorties), flexibility (sorties in excess of the minimum to be used in coping with unusual developments), and maximum assurance that very few targets require restrike. This implies use of the highest yield weapon commensurate with priority, stockpile configuration, operational considerations, and to a degree that will insure target destruction. If operational or combat considerations preclude the full realization of these general objectives, then the potential usefulness of the target must be denied the enemy during the decisive phase.

In keeping with the above, the following damage criteria are established:

(1) Cratering of runways, if fuzing permits.

(2) Cratering of underground targets desired.

(3) A 90% probability of collapse of all above-ground structures, whether on airfields or in areas containing Air Power Battle targets.

(4) A 70% probability of damage on individual targets if the total average for any complex amounts to 90%, although the 90% probability of damage is desired.

(5) The criteria in the preceding sub-paragraph are less in satellite areas (50% - 70%).

(6) Collapse vulnerability numbers assigned to all Air Power Battle and industrial structures.

d. Fuzing Data.

WEAPON	VN	HEIGHT OF BURST
TN	All	Contact
Atomics	All	1200 feet

e. Height of burst. As low a height of burst as possible, contact burst being the desired goal, is stipulated for all TN weapons in order to provide for collapse of important targets, the majority of which bear a VN higher than 12, through precursor effect of these types of weapons. An air burst would result in decrease of blast effect on high VN's and consequent

destructing of the collapse objective. This objective must be retained in the case of Air Power Battle targets, particularly airfields where cratering is required to preclude any possibility of recuperation during the decisive phase of the conflict.

Since time is of the essence in the winning of the Air Power Battle, primary reliance must, of necessity, be placed on blast effects in order to assure target destruction within this limited time period. Primary reliance cannot be placed on thermal or radiation effects since both are relatively ineffective compared with blast. Radiation effects are particularly ineffective in terms of time, due to their delayed arrival and subsequent decay.

The full implications of surface bursts for nuclear weapons have been carefully weighed. While the objection to surface burst and the probability of radio active fall-outs effecting friendly forces and peoples have been considered, the requirement to win the Air Power Battle is paramount to all other considerations. If the Air Power Battle is not won, the consequences to the friendly world will be far more disastrous than the expected effects of fall-out contamination in the peripheral areas. With regard to friendly forces and peoples, as noted previously, every effort has been made to hold to a minimum the number of nuclear weapons programmed for targets in Satellite countries. Although surface bursts for airfield targets are considered essential, this rule can and will be waived in specific instances where friendly forces may be seriously threatened by fall-out hazards from such bursts. However, it must be borne in mind that the weight of the SAC attack will probably be such that blast, radiation effects and fires will have preceded fall-out in many areas. Further, the fact cannot be ignored that Allied forces and countries will undoubtedly be subject to atomic and nuclear attacks by Soviet forces. In such circumstances, the direct and fall-out effects of these enemy weapons may well render academic the problem of fall-out from our own weapons. Finally, although localized fall-out hazards from surface-burst nuclear weapons are greater, world-wide contamination is minimized when the surface burst is utilized.

Height of burst for atomic weapons is as stated in the preceding sub-paragraph d. These weapons are primarily for use in the Satellites and for employment against low VN targets. Aircraft survival is not a major consideration.

f. Multiple Weapons. Multiple weapons on some targets are dictated by the worth of the target, its size, type of weapon employed, and damage criteria. Also it must be appreciated that some aircraft will abort, others will be attrited, some weapons will be duds, and some gross errors will occur. In the case of a target whose priority demands its immediate destruction in support of the Air Power Battle objective, it is mandatory that all of these factors be considered. The commitment of one aircraft and weapon to such a target would provide an unacceptably low probability of target destruction. The time element of the Air Power Battle is such as to prohibit dependence on re-attack after assessment of the initial attack. Sufficient weapons must be launched on the initial attack to provide a target destruction probability approaching certainty.

g. Missiles. Due to the low single weapon destruction probability of missiles, they will be used generally to augment and support, but not to replace, the manned bomber force. They may play a useful role to aid the bomber force in penetrating a target area by saturating it, by diverting some of the enemy's defensive forces, and possibly, by neutralizing specific targets pending a bomber strike. SNARK may be utilized in this manner throughout the target system, although its vulnerability will seriously limit the amount of dependence which can be placed on its effects. REGULUS, because of limited range, may play the same role in peripheral areas. RASCAL may be used in penetration of immediate defenses. ~~GRIDSECT will be used against radar sites.~~

h. Alternate Weapons. The probable carrier-weapon combination, together with alternate weapons for each type of aircraft, is depicted on page 6 . In addition, this command has stated a requirement for a 60 Kiloton weapon. The [redacted] The 60 KT weapon has not been programmed against the target system outlined in this study, since the basic directive specifically restricts weapons to those listed in Annex "B" of the appendix to SM-129-56. This weapon represents an additional

requirement to this command, over and above the stockpile requirement for Part I of the study. The 60 MF weapon is considered essential, not only as a deterrent, but also to assure significant results even with a greatly reduced force in the event of a surprise attack by the Soviets.

i. Weapon Requirement. The spectrum of weapon application and requirement by types of targets is indicated on the following pages. Computations and factors used in arriving at the stockpile composition for Part I and Part II are included in paragraph 4 above, "Factors."

(1)

(2)

WEAPON APPLICATION AND REQUIREMENT - PART I
UNRESTRICTED ALLOCATION
Section I

CATEGORY	
A. AIR POWER BATTLE	
I - Atomic Forces	
Airfields	
Headquarters	
Depots	
II - Defense Forces	
Airfields	
Controls	
Missile Sites	
III - Atomic Industry	
IV - Control Centers	
V - Air Industry	
B. SYSTEMATIC DESTRUCTION	
I - War Supporting Resources	
Sub-Total DGZ's	
Sub-Total BRL	
Sub-Total Requirement	

EOIA(1) (3) - 42 USC 2168(a) (1) (C) - FRD

[illegible] ALLOCATION AND REQUIREMENT - PART I (Continued)
UNRESTRICTED ALLOCATION
Section 2

CATEGORY	
A. AIR POWER BATTLE	
I - Atomic Forces	
Stockpile Sites	
II - Defense Forces	
Controls	
Missile Sites	
C. OTHER	
I - AIR POWER BATTLE	
SAM Sites	
SSM Storage Sites	
ICBM Sites	
Regroup Airfields	
Radar Sites	
II - SUPPORT	
On-Call Targets ROMEO, Misc Targets (MM Sites, Bridges, Troop Concentrations)	
Sub-Total DGZ's	
Sub-Total BRL	
Sub-Total Requirement	
SAC TOTAL DGZ's	
SAC TOTAL BRL WEAPONS	
TOTAL SAC REQUIREMENT	

[redacted] FOIA(b)(3) - 42 USC 2168(a)(1)(C) - FAD

1. Weapon Requirement. (Continued)

WEAPON APPLICATION AND REQUIREMENT - PART II

RESTRICTED ALLOCATION

(3) [redacted] This desired composition has been tailored to the size of the 1959 force, and proportioned to the 3400 DGZ target system outlined for Part I:

TYPE & NUMBER OF WEAPONS	TOTAL OF ALLOY EQ (Kg)
MK 6-B	[redacted]
MK 6-C	
MK 28	
MK 15	
MK 36	
MK 27	
W-35	
W-37	

(4) The following table also shows the number of DGZ's that can be attacked both with and without consideration for base loss:

WEAPON
MK 6-B
MK 6-C
MK 28
MK 15
MK 15
MK 36
MK 27
MK 27
W-35
W-37
TOTAL

base loss, destruction of only 1209 DGZ's can be assured. Under these conditions, this command has elected to ignore the base loss factor, on the assumption that JCS reserves will be made available to SAC as required. Accordingly, the application of weapons to targets for Part II has been based on a 1209 DGZ configuration.

WEAPON APPLICATION AND REQUIREMENT - PART II
RESTRICTED ALLOCATION
1200 DOZ's

CATEGORY	
A. AIR POWER BATTLE	
I - Atomic Forces	
Airfields	
Headquarters	
Depots	
II - Defense Forces	
Airfields	
Controls	
Missile Sites	
III - Atomic Industry	
IV - Control Centers	
V - Air Industry	
B. SYSTEMATIC DESTRUCTION	
I - War Supporting Resources	
Sub-Total	
A.E. Stockpile Sites	
SAM Sites	
IRBM Sites	
Radars	
Sub-Total	
TOTAL DOZ's	
TOTAL ERL WEAPONS	
TOTAL SAC REQUIREMENT	

6. Format.

a. General. The principal parts of this document are:

(1) Cross-reference list, for ease in identifying names with different spellings.

(2) Category Code list, for ease in determining the nature of targets.

(3) Part I target list, wherein weapons are programmed against targets on the basis of unrestricted allocation.

(4) Part II target list, wherein weapons are programmed against targets on the basis of 69,000 Kg of oralloy equivalent.

(5) Tabular presentations of:

Part I - Atomic Weapon Requirements

Part II- Desired Stockpile Composition

Part I - Teloscoped Summary

Part II- Teloscoped Summary

b. Description of Listings.

(1) The cross-reference list is an alphabetical and sequential reference number listing of name places. Opposite each one of them a reference is made to the major complex name under which the place is grouped in the main body of target listings (Part I and Part II). Airfields are clearly designated as such. (See page 17).

(2) The Category Code List gives a translation of the three-digit figures appearing under each complex name, and thereby serves as a means of describing the nature of the target. This numerical code, like others in the body of the listings, was designed for adaptation to EAM processing methods. (See page 154).

(3) Part I is sub-divided into an Airfield List and a Complex List.

(a) In the Airfield List, the information is presented alphabetically; each column, from left to right, pertains to the following: priority number, reference number, name, DGZ, weapon types, command interest. Since all airfield weapons are surface-burst, no columns to indicate air or surface burst are included.

(b) In the industrial Complex List, the format is similar (see page 16 for sample format).

(4) Part II follows the same format as in Part I.

(5) All target duplications with other commands are clearly indicated in the columns at the right side of each page.

(6) Tabular Presentations for Parts I and II follow the format of Annex C, SM 129-56.

SAMPLE PAGE - INDUSTRIAL COMPLEXES (See page 200)