

APPROVED FOR
RELEASE DATE:
16-Jul-2011

Case No. 89-170
Continental No. 4

The Library staff
you obtain a copy
DOE

ANNEX D
NIE 11-5-57
12 March 1957
TS 117212

HR70-14

~~TOP SECRET~~



NATIONAL INTELLIGENCE ESTIMATE
NUMBER 11-5-57

SOVIET CAPABILITIES AND
PROBABLE PROGRAMS
IN THE GUIDED MISSILE FIELD

ANNEX D
ESTIMATED SOVIET NUCLEAR WARHEAD CAPABILITIES

Submitted by the
DIRECTOR OF CENTRAL INTELLIGENCE

The following intelligence organizations participated in the preparation of this estimate: The Central Intelligence Agency and the intelligence organizations of the Departments of State, the Army, the Navy, the Air Force, and The Joint Staff.

Concurred in by the
INTELLIGENCE ADVISORY COMMITTEE

on 12 March 1957. Concurring were the Special Assistant, Intelligence, Department of State; the Assistant Chief of Staff, Intelligence, Department of the Army; the Director of Naval Intelligence; the Director of Intelligence, USAF; the Deputy Director for Intelligence, The Joint Staff; and the Atomic Energy Commission Representative to the IAC. The Assistant Director, Federal Bureau of Investigation, abstained, the subject being outside the jurisdiction of the FBI.

*Supervised by NIE 11-2-57
By 5/7/57*

~~TOP SECRET~~

Rec'd & indexed "Miss" 5/26/57



1 Copy of 75 Copies

CENTRAL INTELLIGENCE AGENCY
DISSEMINATION NOTICE

1. This estimate was disseminated by the Central Intelligence Agency. This copy is for the information and use of the recipient indicated on the front cover and of persons under his jurisdiction on a need to know basis. Additional essential dissemination may be authorized by the following officials within their respective departments:
 - a. Special Assistant to the Secretary for Intelligence, for the Department of State
 - b. Assistant Chief of Staff, Intelligence, for the Department of the Army
 - c. Director of Naval Intelligence, for the Department of the Navy
 - d. Director of Intelligence, USAF, for the Department of the Air Force
 - e. Deputy Director for Intelligence, Joint Staff, for the Joint Staff
 - f. Director of Intelligence, AEC, for the Atomic Energy Commission
 - g. Assistant Director, FBI, for the Federal Bureau of Investigation
 - h. Assistant Director for Central Reference, CIA, for any other Department or Agency
2. This copy may be retained, or destroyed by burning in accordance with applicable security regulations, or returned to the Central Intelligence Agency by arrangement with the Office of Central Reference, CIA.
3. When an estimate is disseminated overseas, the overseas recipients may retain it for a period not in excess of one year. At the end of this period, the estimate should either be destroyed, returned to the forwarding agency, or permission should be re-requested of the forwarding agency to retain it in accordance with IAC-D-69/2, 22 June 1953.

WARNING

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

DISTRIBUTION:
White House
National Security Council
Department of State
Operations Coordinating Board
Department of Defense
Atomic Energy Commission
Federal Bureau of Investigation

~~TOP SECRET~~

TS 117212

Annex D — NIE 11-5-57



SOVIET NUCLEAR WARHEAD CAPABILITIES

1. In order to permit rough estimates of Soviet nuclear warhead capabilities and for ease in presentation, Soviet nuclear warhead types have been divided into six basic assemblies which resemble weapons tested, or that can be developed from those tested, and which would satisfy major Soviet military requirements.¹

a. Assembly A—

b. Assembly B—

c. Assembly D—

d. Assembly E—

e. Assembly F—

f. Modified Assembly A—

2. In order to calculate the possible missile warhead stockpiles, the following information is required:

- Total amount of fissionable material available² (see Table XVI, NIE 11-2-56).
- The amount of material required for each type of warhead.
- The estimated allocation of fissionable material to the given warhead type.

3. Table I lists the various missiles together with their estimated performance characteristics and availability dates. Table II lists the weight ranges and estimated availability dates for nuclear warheads estimated to be of most interest in equipping the missiles in Table I with such warheads. The nuclear warhead characteristics shown in Table II are consistent with those estimated in NIE 11-2-56, "The Soviet Atomic Energy Program." However, in a few cases new characteristics are shown for the period after 1960 which was the last date considered in NIE 11-2-56. The yields shown are in each case the maximum estimated for a particular warhead and while these yields are estimated to be the most probable they are considered accurate only within the range of one-half to twice the tabulated value. The weights shown are those esti-

²The Director of Naval Intelligence did not concur with the figures in NIE 11-2-56 for the estimated production of U-235, and for the estimated production of plutonium after 1959, which were used as a basis for the calculations in this estimate. The Director of Naval Intelligence believes the figures to be too high, and that for planning purposes a more practical magnitude of cumulative quantities of U-235 would be in the range below that of the minus 50 percent lower limit of the estimates in NIE 11-2-56.

¹These basic assemblies are as estimated in NIE 11-2-56, "The Soviet Atomic Energy Program," 8 June 1956. This estimate will be superseded by the forthcoming NIE 11-2-57.

~~TOP SECRET~~

~~TOP SECRET~~

2

mated for the nuclear warhead itself. Minor adjustment in these weights, required to fit additional delivery systems, can be made without serious difficulty. The estimated yields for warheads which will become available within the next few years are based in general on relatively easy developmental advances over those already tested by the USSR. However, several estimated accomplishments after 1958 are based on the successful application of major developmental advances. Improvements which may take the form of greater economy of critical materials or somewhat increased yields can be expected for time periods later than the date given for initial missile availability.³

4. The following list of nuclear warhead characteristics are applicable to the missile systems shown in Table I:

a. By about 1960 a warhead weighing 150 pounds is estimated to be

b. By 1955 a warhead weighing from 400 to 800 pounds would have

c. By 1954 a warhead weighing from 1000 to 2000 pounds would have

d. By 1955 a warhead weighing from 3000 to 4000 pounds would have

e. By 1956 a warhead weighing 6000 pounds would have

5. Table III lists the missiles assumed in Part IV of the basic estimate to be equipped with nuclear warheads, quantity of each, dates they will become available, yields, and the percentages of fissionable materials estimated to be available in NIE 11-2-56, that would be required to support this assumed program.⁴ In addition the following general assumptions are made:

- a. The missiles are equipped with nuclear warheads the same year the missile is produced.
- b. A desired yield compatible with the missile payload and CEP is assumed.
- c. Conservation of fissionable materials is stressed wherever a selection between nuclear assemblies is possible.

⁴ See Footnote 2.

~~TOP SECRET~~

TS 117212

~~TOP SECRET~~

3



TABLE I

MISSILE CHARACTERISTICS

	RANGE IN NM	CEP	PROBABLE DATE AVAILABLE	WARHEAD WEIGHT (POUNDS)
SA-1.....	25	50 or 150 ft.....	1955	600-700
SA-3.....	50	100 or 500 ft.....	1959	500-800
SA-7.....	50	100 or 500 ft.....	1960	500-800
SA-4.....	100	100 or 500 ft.....	1961	500
SA-5.....	40 or 150	500 or 1,200 ft.....	1963-1966	1,000
AA-3.....	15-20	50 ft.....	1960	150
AS-1.....	20	300 ft.....	1955	3,000
AS-2.....	55	150 ft.....	1956-1957	3,000
AS-3.....	55	150 ft.....	1958	3,000
AS-4.....	100	.5-2 NM.....	1961	3,000
SS-1.....	75	1,200 ft.....	1954	*2,000
SS-2.....	175-200	1-2 NM.....	1954	*2,000
		2,000 ft.....	1955-1957	
SS-3.....	350	1-2 NM.....	1954	*2,000
		3,000 ft.....	1955-1957	
SS-8.....	500	.5-10 NM.....	1955	3,000
SS-9 Supersonic.....	500	.5-10 NM.....	1967	3,000
SS-4.....	700	3 NM.....	1956	6,000
		1-2 NM.....	1957	
SS-10.....	1,000	1-10 NM.....	1962	3,000
SS-5 (IRBM).....	1,600	3-4 NM.....	1959	1,650
		1-2 NM.....	1960-1961	
SS-7 (IRBM).....	1,600	1-2 NM.....	1966	1,650
SS-6 (ICBM).....	5,500	5 NM.....	1960-1961	1,500

* These payload weights represent our basic estimate. However, if the USSR incorporated certain technically feasible refinements in structural design, these missiles could carry to their maximum ranges payloads weighing 1.5 to 2 times as much as those estimated. We have no evidence of such Soviet developments.

~~TOP SECRET~~

TS 117212



TABLE II

NUCLEAR WARHEADS*

WEIGHT (POUNDS)	YEAR
150.....	1960
400-800.....	1955
	1959-1960
1,000-2,000.....	1954
(Upper weight range).	1947-1958
(Upper weight range).	1959-1960
(Lower weight range).	1963-1966
3,000-4,000.....	1955
	1957-1958
	1959-1960
6,000.....	1956
	1957-1958
	1959-1960

* See Footnote 2.



TABLE III⁷

NUCLEAR WARHEADS FOR SELECTED MISSILES IN POSSIBLE PROGRAM⁸
(See Annex A, Par. 36)

MISSILE	DATE OF WAR-HEAD AVAIL-ABILITY	QUANTITY PRODUCED BY YEAR	ASSEMBLY	ASSUMED DE-SIRED YIELD	AVAILABLE YIELD
SS-4	1956		B		
	1957		D		
	1958		D		
	1959		F		
	1960		F		
SS-5 (IRBM)	1959		D		
	1960		D		
	1961		D		
	1962		D		
SS-6 (ICBM)	1960		D		
	1961		D		
	1962		D		
	1963		D		
	1964		D		
	1965		D		
SS-8 and SS-9	1955		B		
	1956		B		
	1957		D		
	1958		D		
	1959		D		
	1960		D		
SS-10	1962		F		
	1963		F		
	1964		F		
	1965		F		
	1966		F		
	1966		F		
SA-5	1964		F		
	1965		F		
	1966		F		
AS-4	1961		F		
	1962		F		
	1963		F		
	1964		F		
	1965		F		
	1966		F		

⁷ It is highly desirable and most probable that some percentage of other missiles, particularly surface-to-air and shorter range air-to-surface and surface-to-surface missiles would be provided with nuclear warheads. We are unable to postulate valid percentage allocations, and present the following only for illustration:

⁸ See Footnote 2.



TABLE IV

DATE	PERCENTAGE OF AVAILABLE * CUMULATIVE FISSIONABLE MATERIALS REQUIRED FOR SELECTED MISSILES IN POSSIBLE PROGRAM (See Annex A, Par. 36)	
	Uranium 235	Plutonium
1955.....		
1956.....		
1957.....		
1958.....		
1959.....		
1960.....		
1961.....		
1962.....		
1963.....		
1964.....		
1965.....		
1966.....		

* Estimated amounts of fissionable material available are from NIE 11-2-56. See Footnote 2.

