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Plans and Policies for
the Ballistic Missile
Initial Operational Capability
Program

by

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ATOMIC ENERGY

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FOREWORD

The development, production, and operational deployment of intermediate-range and intercontinental ballistic missiles probably constitutes the most intensive, complex, and expensive military program ever undertaken in American history. Certainly, it far exceeds in scope any other program attempted during a peacetime period. The objective of the program was far more than just the attainment of operational weapon systems. The continuance of peace, an uneasy one to be sure, and the very future and well-being of the "free world" depended in large measure upon a successful and energetic prosecution of the ballistic missile program.

The United States Air Force, apprised through the media of several special studies of both the urgent requirement for rocket-propelled missiles and of recent major technological advances and possibilities, responded in 1954 with the establishment of a unique organization and management structure to carry out the important job. The structure was designed to harness the composite skills, knowledge, and facilities of the military service, the scientific world, and American industry in a major, concerted effort. No less important, the Air Force expected the new approach to compress the development-production-operation cycle by eliminating much of the inherent "red tape" so characteristic of the coordinating and decision-making processes at the various echelons of command and control.

The Secretary of Defense and the President took special measures at their levels. They established special units and instituted special procedures--all for the purpose of easing the management task. They assigned the highest priority ratings to the program and removed likely areas of administrative impediments. Finally, they kept themselves intimately informed on each step of progress during the course of the program.

This historical study covers only a unique part of the novel organization and management structure employed in the ballistic missile program. The particular topic under review concerns the formulation of policies and the preparation of plans for an initial operational capability--the scheme for obtaining and deploying production prototype ballistic missiles at the earliest practicable date as an addition to this nation's deterrent forces. At first glance, the subject appears narrow in scope. The ballistic missile program, however,

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is so broad and complex that the story of the initial operational capability is indeed a topic of wide breadth and immense significance.

Historians elsewhere in the Air Force--at the Air Force Ballistic Missile Division, the Ballistic Missile Center, the Air Force Missile Test Center, the Strategic Air Command, the Air Training Command, the 1st Missile Division, the 7th Air Division, and other organizations--are covering through the means of semiannual and case histories the "operational" role of their organizations in the establishment of an initial operational capability. Accordingly, the author of this study has restricted his work to the "plans and policies" aspect, primarily at the Washington level. He has referred to other phases of the program only to the extent deemed necessary in making the "plans and policies" story a complete one.

The author is grateful to a large number of participants in the ballistic missile program at Headquarters USAF and at the Air Force Ballistic Missile Division for their assistance and advice in the preparation of the study. He is particularly indebted to Maj. Gen. Charles M. McCorkle, Assistant Chief of Staff for Guided Missiles from late 1956; his successor in mid-1959, Brig. Gen. Robert E. Greer; Col. Leo C. Brooks, chief of the Missiles Branch, Strategic Division, Office of Deputy Chief of Staff, Operations; Lt. Col. Edwin J. Istvan of the Ballistic Division, Office of the Assistant Chief of Staff for Guided Missiles; Brig. Gen. Charles H. Terhune, vice commander of the Air Force Ballistic Missile Division, and other officials of that division and SAC-MIKE; and Mr. Joseph W. Angell, Jr., chief of the USAF Historical Division Liaison Office. Their suggestions and their interpretations and explanations of many seeming discrepancies of fact were extremely helpful; their review and criticism of the original draft was invaluable.

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CHRONOLOGY

- Apr 46 AMC contracts with Convair for study and research on the MX-774 rocket missile.
- Jun 47 MX-774 canceled.
- 16 Jan 51 USAF directs establishment of Atlas long-range rocket missile project MX-1593, with Convair as contractor.
- 16 Jun 53 Defense Secretary Wilson directs review of national missile program by ad hoc Special Study Group on Guided Missiles, with Trevor Gardner as chairman.
- 31 Oct 53 Trevor Gardner establishes Strategic Missiles Evaluation Committee (SMEC) under Dr. John von Neumann to review Air Force strategic missile program.
- 25 Jan 54 Special Study Group on Guided Missiles submits its report.
- 8 Feb 54 RAND study recommends reorientation and acceleration of Atlas development.
- 10 Feb 54 SMEC recommends reorientation and acceleration of Atlas development.
- 4 Mar 54 Aircraft and Weapons Board proposes an Atlas "crash" development.
- 11 Mar 54 Gardner recommends to Secretary of Air Force new organization structure for accelerated Atlas development.
- 15 Mar 54 Air Force Council concurs in Aircraft and Weapons Board recommendation of 4 March.
- 19 Mar 54 Air Force Secretary Talbott places Gardner in charge of Atlas project and directs Chief of Staff to reorient and accelerate Atlas development.

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- 23 Mar 54 Chief of Staff approves AFC recommendation of 15 March.
- 8 Apr 54 Office of Assistant Chief of Staff for Guided Missiles established.
- 9 Apr 54 Deputy Secretary of Defense directs USAF to proceed on Atlas development with all practicable speed.
- 21 Jun 54 DCS/D directs ARDC to reorient and accelerate Atlas development and to establish a special field office on the west coast specifically for the work.
- 15 Aug 54 The newly created Western Development Division (WDD) under Brig. Gen. B. A. Schriever assumes responsibility for Atlas development.
- 14 Feb 55 Technological Capabilities Panel (Killian Committee), ODM, recommends to President the highest priority for ballistic missiles (and emphasizes requirement for 1,500-mile ballistic missile).
- 17 Mar 55 The National Security Council asks for DOD comments on Killian Committee report.
- 2 May 55 USAF authorizes WDD to develop Titan.
- 25 May 55 WDD assigned responsibility to develop a tactical ballistic missile.
- 3 Jun 55 DOD submits its views on the Killian report. Agrees on high priority for ballistic missiles and, in principle, on the development of an IRBM.
- 28 Jun 55 Gardner proposes to Talbott that ballistic missile program be accorded highest national priority.
- 30 Jun 55 Senators Anderson and Jackson also propose to the President the highest national priority for ballistic missile program.
- 6 Jul 55 President meets with Wilson and Talbott and asks for a full briefing on ballistic missiles later in the month.

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28 Jul 55 DOD officials brief the President and NSC on the ballistic missile program.

4 Aug 55 NSC reviews DOD ballistic missile recommendations of 3 June and 28 July and agrees to wait until December for a report on IRBM development.

2 Sep 55 JCS concurs in the draft NSC policy statement on ICBM ballistic missiles.

8 Sep 55 NSC and the President grant the ICBM program "the highest priority above all others."

13 Sep 55 Gardner establishes the ICBM Administrative Procedures Evaluation Group (Gillette Committee) to recommend managerial means to expedite ballistic missile development.

Sep-Oct 55 Dispute in JCS over the selection of service(s) to develop and operate IRBM's.

14 Oct 55 Final version of Gillette Committee report, including many administrative procedural innovations, submitted to Gardner.

25 Oct 55 Gardner sent Gillette Committee report to Wilson.

2 Nov 55 JCS submits "split" paper to SOD on IRBM development and operational assignments.

8 Nov 55 Wilson approves Gillette Committee report and establishes the OSD Ballistic Missiles Committee (OSD-BMC).

8 Nov 55 Wilson accepts JCS majority view and approves development of Thor (by USAF) and Jupiter (by Navy-Army) IRBM's for employment by USAF and Navy, respectively.

14 Nov 55 Quarles establishes Air Force Ballistic Missiles Committee (AFBMC) and directs Chief of Staff to institute the recommendations of Gillette Committee report.

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18 Nov 55 Gen. White directs establishment of new management procedures for ballistic missile program and assigns to ARDC the responsibility for establishing the ICBM initial operational capability (IOC).

23 Nov 55 AFBMC meets for first time. It calls for a complete ICBM IOC plan by April 1956.

1 Dec 55 NSC and the President grant the IRBM projects a priority equal to that of the ICBM.

28 Dec 55 USAF defines the ICBM IOC as 3 groups of 120 missiles (80 Atlas and 40 Titan) and 60 launchers on 3 bases, one each in eastern, central, and western United States. The whole IOC force is to be operational by 1 January 1960.

20 Feb 56 USAF assigns operational control of IRBM's to SAC.

19 Mar 56 WDD submits first ICBM IOC plan to USAF, which refuses to accept it on the grounds that it is too much at variance with the earlier-stated schedules.

22 Mar 56 USAF assigns responsibility for development of IRBM IOC to ARDC and SAC. IOC to consist of eight squadrons (120 missiles and 60 launchers) to be operational between October 1958 and July 1959 at three UK bases.

4 May 56 USAF directs revision of ICBM IOC plan to conform to schedules of 28 December 1955 directive.

7 May 56 ARDC and SAC formally agree on their roles in the IRBM IOC development.

9 May 56 ARDC protests that ICBM and IRBM IOC plans based on 28 December 1955 and 22 March 1956 directives are technically and operationally unrealistic.

15 May 56 ARDC-WDD team briefs Gen. White on ICBM and IRBM plans.

17 May 56 SAC indorses the position taken on the IOC plans by ARDC on 9 May 1956.

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- 23 May 56 USAF relaxes ICBM IOC schedule deadlines and moves back completion date from January 1960 to March 1961.
- 1 Jun 56 USAF relaxes IRBM IOC schedule deadlines and moves back completion date from July 1959 to July 1960.
- 3 Jul 56 AFBMC rejects ICBM and IRBM IOC plans for financial reasons.
- 1 Sep 56 Quarles approves Camp Cooke, Calif., as site for first ballistic missile training-operational base. (Cooke AFB redesignated as Vandenberg AFB on 4 October 1958.)
- 27 Sep 56 AFBMC again rejects ICBM and IRBM IOC plans, even though ICBM IOC missile force cut from 120 missiles to 80.
- 10 Nov 56 AFBMC generally agreeable to latest IOC plan, which reduces the ICBM IOC force to two groups (40 Atlas and 40 Titan) and the IRBM IOC force to four squadrons (from 120 missiles to 60 missiles).
- 16 Nov 56 Air Force Secretary Quarles approves IOC plans.
- 5 Dec 56 OSD-BMC approves IOC plans "in principle."
- 11 Jan 57 Annual DOD ballistic missile presentation to NSC and the President. They approve IOC plans but not the force structure.
- 5 Mar 57 USAF supersedes ICBM IOC directives of 18 November and 28 December 1955 and IRBM IOC directive of 22 March 1956. Headquarters calls for an ICBM IOC force of two groups (80 missiles) to be operational between March 1959 and March 1961 and for an IRBM force of four squadrons (60 missiles) to be operational between July 1959 and July 1960.
- 21-24 Mar 57 President and UK prime minister reach broad agreement on deployment of IRBM to UK.

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28 Mar 57 NSC and President approve USAF IOC force structure, to be available "at the earliest practicable date."

1 Apr 57 1st Missile Division and 392d Air Base Group activated under WDD.

May 57 Construction of Atlas facilities begins at Cooke AFB.

22 May 57 In an effort to keep defense expenditures down, Wilson directs a reduction in ballistic missile overtime costs.

27 May 57 AFBMC directs large overtime cost reduction.

1 Jun 57 WDD redesignated Air Force Ballistic Missile Division (AFBMD).

Jun 57 Construction of Titan facilities begins at Cooke AFB.

1 Jul 57 704th Strategic Missile Wing activated.

3 Jul 57 DOD officials brief NSC on national missile program. The latter adjudges it too costly.

31 Jul 57 Wilson submits proposals to NSC to revise ballistic missile program. These include the reduction of Titan's priority rating, the suspension of Thor production plans, and the selection of Thor or Jupiter at a later date as the IRBM system.

1 Aug 57 NSC and the President approve Wilson's proposals of the previous day.

7 & 9 Aug 57 USAF asks Wilson for less stringent program reductions, so that the ICBM IOC will be complete between June 1959 and October 1962 and the IRBM IOC between December 1959 and June 1961.

13 Aug 57 Wilson reduces Thor to an "R&D" project, cuts Thor overtime costs further, suspends or cancels Thor

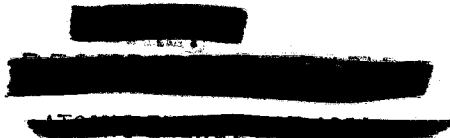
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- ground support equipment contracts, and allows production of Thor sufficient only to supply flight-test requirements.
- 16 Aug 57 Wilson reduces planned Atlas production rate, relegates Titan to R&D status, and cuts further overtime allowances.
- 26 Aug 57 The Soviet Union announces the successful flight test of an ICBM.
- 12 Sep 57 At Wilson's request, AFBMD presents effects of latest program cuts and compares them with a more drastic reduction proposed by Wilson.
- 15 Sep 57 392d Missile Training Squadron (Thor) activated.
- 19 Sep 57 Wilson generally reaffirms his decisions of 13 and 16 August on the ICBM and IRBM programs, keeping Thor in indefinite status and postponing completion of the ICBM IOC by about 15 months.
- 4 Oct 57 The Soviet Union launches the earth's first artificial satellite--Sputnik I.
- 5 Oct 57 Wilson restates his 19 September directive but the objectives remain unchanged.
- 8 Oct 57 Gen. White asks Air Staff for new ballistic missile acceleration and augmentation plans.
- 9 Oct 57 BMD supplies preliminary data for accelerating and augmenting the ballistic missile program.
- 9 Oct 57 Neil McElroy replaces Wilson as Secretary of Defense.
- 10 Oct 57 NSC and the President call for early deployment of IRBM's with relaxed performance characteristics.
- 16 Oct 57 After reviewing ballistic missile plans to date, White directs preparation of new plans as part of an overall defense package.

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- 25 Oct 57 BMD supplies additional ballistic missile program planning data.
- 31 Oct 57 McElroy, in separate directives to USAF and the Army, rescinds certain restrictions on Thor and allows for the first time the development of Jupiter as a weapon system.
- 8 Nov 57 Air Force Secretary Douglas asks McElroy for the removal of all restrictions on Thor.
- 14 Nov 57 USAF overall defense package goes to DOD and NSC. Air Force asks for 18 Thor squadrons and advancement of the operational date for the first IOC squadron from December 1959 to August 1959 and of the fourth IOC squadron from January 1961 to May 1960. The Air Force also asks for nine Atlas and eight Titan squadrons and the advancement of IOC operational dates to between July 1959 and January 1962.
- 18 Nov 57 Douglas submits new IRBM IOC plan to DOD that would have the first squadron operational by June 1958 and the fourth by June 1959.
- 25 Nov 57 McElroy decides to put both Thor and Jupiter into production for operational employment.
- 26 Nov 57 The President approves the Thor and Jupiter plans.
- 27 Nov 57 DOD directs the Air Force and Army to deploy four squadrons each of Thor and Jupiter, to be operational between 31 December 1958 and March 1960.
- 27 Nov 57 AMC, ARDC, and SAC leaders meet at Wright-Patterson AFB at White's direction. They recommend the elimination of the special IOC procedures and the transfer of all IOC responsibilities to SAC.
- 29 Nov 57 White announces his decision to eliminate the IOC program.
- 3-6 Dec 57 ARDC and SAC officials work out arrangement for the



transfer of IOC training and operational responsibilities to SAC.

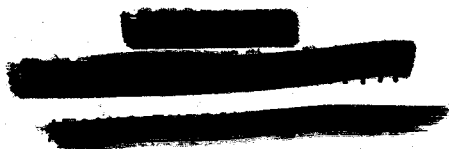
- 12 Dec 57 DOD approves, for planning purposes, nine Atlas squadrons as proposed by USAF on 14 November but keep Titan program at four squadrons.
- 20 Dec 57 USAF approves the ARDC-SAC proposal for the transfer of training and operational responsibilities.
- 21 Dec 57 British parliament approves the deployment of Thor to the UK.
- 31 Dec 57 ARDC and SAC draft the formal agreement of transfer of IOC responsibilities.
- 1 Jan 58 Transfer of training and operational responsibilities effected; SAC-MIKE established.
- 1 Jan 58 672d Strategic Missile Squadron (Thor) and 706th Strategic Missile Wing (Atlas) activated.
- 30 Jan 58 Third annual DOD briefing on ballistic missiles given to NSC and the President. They approve ballistic missile program as reoriented on 27 November and 12 December 1957.





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Chapter I

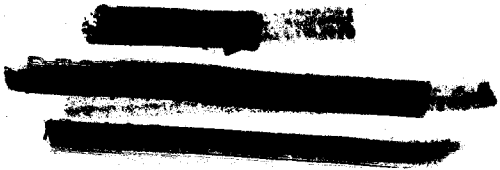
GENESIS OF THE LONG-RANGE BALLISTIC MISSILE

The Army Air Forces during World War II conducted experimentation on a variety of "guided missiles," more than 60 different types in all. By and large, the work consisted of adapting various guidance devices to existing weapons or aircraft. The Germans, on the other hand, emphasized the development of completely new guided weapons and succeeded, in the summer of 1944, in employing operationally the pulsejet V-1 "buzz bomb" and the rocket-powered V-2 ballistic missile.

The significance and potential of these and other German guided missiles was immediately realized by a band of enthusiasts within the AAF. Before the close of the war, they began the formulation of a postwar long-term guided missile development program. By May 1945 the Air Staff had drafted military characteristics for a family of missiles covering all foreseeable requirements of the next decade. During the next several months, AAF headquarters released piecemeal to the Air Technical Service Command (ATSC) about one-half of these statements in all major categories: air defense, tactical air support, and strategic bombardment.¹

ATSC, starting in October, then solicited research proposals from industry. By the end of April 1946 the Air Materiel Command (AMC)*

* In March 1946 the Air Technical Service Command became the Air Materiel Command.



had received the proposals, evaluated them, and let about 25 one-year research and study contracts for the several types of required missiles.²

One of the contractors was Consolidated-Vultee (Convair), selected to conduct a study on surface-to-surface strategic missiles capable of operating at ranges between 1,500 and 5,000 miles. Among others, Convair studied the feasibility of a rocket-propelled ballistic missile, and initial findings indicated the ultimate success of such a weapon, some eight to ten years in the future.³

Unfortunately, during December 1946, the AAF sustained a tremendous reduction in its missile development funds and anticipated another for fiscal year 1948. Accordingly, in line with retrenchment plans prepared by AMC on the basis of both finances and current technology, the AAF in June 1947 canceled Convair's contract. In lieu of the rocket missile, the AAF decided to rely initially on the speedy development of the Northrop jet-propelled subsonic Snark (and supersonic Boojum) and eventually on North American's development of a nuclear ramjet-propelled Navaho to meet strategic bombardment requirements. The AAF allowed Convair to use the remaining unexpended funds to complete and flight-test three research rocket vehicles then under construction and to continue studies on guidance and nose-cone re-entry.⁴

The Air Force attempted to resurrect the Convair project late

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in 1948, but on a somewhat different basis. Earlier in the year, Convair had conducted three fairly satisfactory flights with the test vehicle, so the AAF proposed it for the role of the nation's high-altitude research vehicle. After comparing the vehicle's projected capabilities against those of the Navy's Viking, the Research and Development Board's Committee on Guided Missiles, in April 1949, decided to retain the Viking. The Air Force consequently dropped its proposal; Convair, however, continued to devote a limited amount of money and effort to rocket missile research.⁵

The Air Force renewed its interest in the application of rocket power to long-range missiles late in 1949 and 1950, following a series of studies by the RAND Corporation and several aeronautical firms. These studies indicated that advances in various technologies, particularly that of rocket propulsion, made a long-range rocket missile technically feasible. Late in 1950 the Air Force decided to pursue the matter further and, on 16 January 1951, authorized \$500,000, directing AMC to establish a study project with Convair.⁶

The directive called for a two-phase study of a rocket missile with a minimum range of 5,500 nautical miles, a minimum speed of Mach 6 over the target, a circular probable error (CEP) of 1,500 feet, and a nuclear warhead. In the first phase, about six months in length, Convair was to determine the cost and time of development, the general

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configuration, and the technical problems peculiar to both glide rocket and ballistic rocket missiles. Following Air Force selection of one or the other for the second-phase study, Convair would examine and attempt to fill gaps in the existing state of knowledge and so provide a firm base from which a development program could proceed at a later date.⁷

The Air Force maintained until 1954 the cautious approach outlined in the 16 January 1951 directive. Convair completed the first phase of the study on schedule, after which Air Force development officials in September 1951 chose the ballistic version for reasons of performance and cost. During the next few years the project, now designated MX-1593 or Atlas, remained a low-priority venture, accorded only routine attention, authorized a minimum of financial support, and beset with tremendous propulsion, guidance, and nose-cone re-entry problems. The technical difficulties resulted from the necessarily stringent propulsion and accuracy requirements stemming from the heavy weight and low-yield characteristics of then current atomic warheads.⁸

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Chapter II

AIR FORCE ACCELERATION OF THE BALLISTIC MISSILE PROGRAM

In the spring of 1953, shortly after the Eisenhower Administration had come into office, Charles E. Wilson, newly appointed Secretary of Defense, imposed a 25-percent reduction on research and development funds budgeted for fiscal 1954. Several weeks later, during the Armed Forces Policy Council (AFPC) meeting of 16 June 1953, Wilson ordered an intensive review of the guided missile programs of the three services. The purpose was largely an economy measure and part of the "new look" and "more bang for the buck" philosophies recently announced by the new Administration. The reviewers were to identify and eliminate duplication of development effort and attempt to standardize on one missile to do the job of several in meeting the various operational requirements of the services.¹

Wilson designated Harold E. Talbott, Secretary of the Air Force, to organize and chair the interdepartmental study group. Talbott appointed his Special Assistant for Research and Development, Trevor Gardner, to conduct the review. A triservice group of generals and senior colonels, officially the Special Study Group on Guided Missiles, met during the next seven months and finally

rendered its formal report to the AFPC on 25 January 1954.²

During the course of the meetings, the group realized that the long-range strategic missiles presented technical problems far beyond those of missiles in general. Moreover, the development of long-range missiles was concentrated almost entirely in one service, the Air Force. Gardner therefore decided to form a special committee of leading scientists to evaluate the Air Force requirements and effort against the current state of technology and recommend measures to hasten the completion of development.³

Gardner's first step was to employ the recently established Ramo-Wooldridge Corporation to organize a working staff and secretariat. Then, on 31 October 1953, Gardner invited 11 outstanding university and industrial scientists to be members of the ad hoc group. Officially designated the Strategic Missiles Evaluation Committee (SMEC), the group also became known as the Teapot Committee or von Neumann Committee (after its chairman, Dr. John von Neumann).^{*4}

Gardner gave the SMEC a period of about four months to study its assignment and make a report. By late in January 1954 the committee had completed drafts of its findings and on 10 February,

* In addition to von Neumann, the SMEC included Clark B. Millikan, Charles C. Lauritsen, Louis G. Dunn, Hendrik W. Bode, Allan E. Puckett, George B. Kistiakowsky, J. B. Wiesner, Lawrence A. Hyland, Simon Ramo, and Dean Wooldridge.