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USAF BALLISTIC MISSILES

1958-1959

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USAF BALLISTIC MISSILES

1958 - 1959

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by

Max Rosenberg

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FOREWORD

This study was originally prepared as a chapter for inclusion in the History of Headquarters USAF, Fiscal Year 1959. Because of the importance and timeliness of the subject, it is being issued in this form to make it more quickly available throughout the Air Force.

Time and space considerations have required that the study concern itself only with ballistic missiles. Other types of missiles will be dealt with subsequently. Although the major focus of the study is the period from 1 July 1958 to 30 June 1959, it was considered desirable to include an account of the evolution of the ballistic missile programs since 1945. Primary concern is with top-level plans, policies, and programs; the development, testing, and operational aspects are to be found elsewhere, in histories and studies issued by ARDC, AFBMD, SAC, and other USAF agencies. A fuller account of some aspects is to be found in the study Plans and Policies for the Ballistic Missile Initial Operational Capability Program, issued by the USAF Historical Division Liaison Office in February 1960.

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From the beginning of postwar development in 1945, determination of the proper role of guided missiles in the nation's defense structure was beset by conflicts over service interests, allocation of funds, and concepts of employment. During the early years the halfhearted support of guided missiles kept interservice disputes at a low pitch. But the anticipated emergence of the Soviet Union as a major missile power, starting in 1954, led to a reappraisal of the American guided missile program. Under close review, the program became the object of a thousand and one charges and countercharges, some valid and others without foundation.

Although all types of guided missiles--strategic, tactical, and air defense--were important to the nation's policy of deterrence and massive retaliation, the most essential and significant was the rocket-propelled strategic ballistic missile. Long before 1959 the ballistic missile had gained recognition as the prime strategic weapon of the future.

Evolution, 1945-58[1]

The Air Force (then Army Air Forces) recognized early the potential of the long-range ballistic missile and incorporated the study and development of such a weapon in its postwar missile development program in 1945. Although subsequent studies by Consolidated-Vultee Aircraft

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Corporation (Convair) pointed to the ultimate success of the ballistic missile, the AAF terminated the company's contract in 1947 because of limited funds and the tremendous problems involved in propulsion, guidance, and nose-cone re-entry. The AAF and Convair nevertheless continued research in the major problem areas on a low scale of effort.

In 1949-50 the Air Force renewed its interest in the application of rocket power to long-range missiles, following a series of encouraging studies by RAND Corporation and several aeronautical firms and successes by North American Aviation in the development of suitable rocket engines. The studies indicated that advancements in various technologies, particularly rocket propulsion, made technically feasible a long-range rocket missile carrying the then-current heavy atomic warheads.

The Air Staff decided to pursue the matter further and on 16 January 1951 directed the Air Materiel Command (AMC) to establish a six-month study to determine cost and time of development, the general missile configuration, and the technical problems peculiar to both long-range glide rocket and ballistic rocket missiles. Upon selection in September 1951 of the ballistic approach, designated MX-1593 or SM-65 Atlas project, the Air Force directed Convair to attempt to fill gaps in the existing state of knowledge and to provide a firm base from which development could proceed at a later date. The Air Force maintained this cautious approach for several years.

Air Force Acceleration of Ballistic Missile Program, 1954

An abrupt reversal occurred, however, in February 1954 when both the Strategic Missiles Evaluation Committee (also known as the Von Neumann or

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Teapot Committee) and RAND submitted extremely encouraging reports to the Department of Defense. Their findings were especially dramatic insofar as they concerned the Atlas ballistic missile.

Essentially, the recent development of a low-weight, high-yield thermonuclear device allowed considerably more latitude in performance parameters. Since the gross weight of a ballistic missile was almost a direct function of the warhead weight, the light weight of the thermonuclear warhead (possibly as low as 1,500 pounds) would allow reduction of the overall Atlas weight by as much as one-half. The reduction in weight meant that three instead of five rocket engines could power the missile to desired ranges.

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Top civilian and military officials of the Air Force and the Department of Defense enthusiastically supported the implications of the Von Neumann and RAND reports. Within a few months, under the aegis of its Special Assistant for Research and Development, Trevor Gardner,* the Air Force reoriented the objectives of the Atlas project, established unique procedures and organizations specifically for Atlas, and accorded the work the highest priority.

*Gardner became Assistant Secretary of Air Force (Research and Development) on 1 March 1955.

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National Priority for Ballistic Missiles, 1955

Although the Air Force allocated a large share of its resources to Atlas as well as to the SM-68 Titan (initiated in May 1955 as a backup to Atlas), Gardner realized that this was not enough. He believed that achievement of an early operational capability was the nation's most urgent and challenging technological task. If the Soviet Union developed the long-range ballistic missile first, the result could be disastrous for the United States. "There must be," said Gardner, "a national awareness and understanding of the real significance of the attainment by the United States--or by the Soviets--of an operational ICBM /Intercontinental Ballistic Missile/ capability in a thermonuclear age." He explained that "by 'national awareness' I mean vigorous backing of the project by the Congress and the President in order to assure that the peacetime checks and balances which are necessary in our system of government will not be the cause of time delays in the accelerated progress of the program."

Gardner received support for his stand from two independent but highly influential sources: the Technological Capabilities Panel (TCP) of the Science Advisory Committee, Office of Defense Management, and the Joint Congressional Committee on Atomic Energy and its Subcommittee on Military Applications. Before the close of 1955, findings and recommendations of these bodies resulted in the acceleration and expansion of the national ballistic missile program.

The TCP or Killian Report (after the panel chairman, James R. Killian) went to the President on 14 February 1955. The panel recommended,

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among other items pertaining to the nation's security, that the National Security Council (NSC) and the President recognize the USAF ballistic missile program as a national effort of the highest priority. The report also strongly urged concurrent development of a 1,500-mile intermediate-range ballistic missile (IRBM).

The congressional impetus was in the form of a letter on 30 June 1955 from Senators Clinton P. Anderson and Henry M. Jackson, respectively chairmen of the atomic energy committee and its subcommittee. Emphasizing their fear that the Russians were far ahead in the ballistic missile competition, the two senators warned that losing the race could result in a breakup of the European alliance--a victim to atomic blackmail--and the outbreak of a war in which the United States could not effectively retaliate. Anderson and Jackson suggested measures to speed development and attainment of an operational force, including putting the program on a wartime footing and assigning it the highest national priority.

On the President's return from the Geneva "summit meetings," he heard a special briefing on 28 July 1955. Action finally came on 8 September when the President approved the assignment of the "highest priority above all others" to Atlas development. The President also notified Anderson of his intent to push the project "without tolerating any of the delays which may attend normal development or procurement programs." Action on the IRBM program awaited Department of Defense recommendations, due about 1 December.

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The President's directive set off a rash of activity within the Department of Defense and the Air Force, looking primarily to the solution of the "red-tape" problem inherent in governmental management procedures. Again, Gardner took the lead and established the Gillette Committee with representatives from the Air Staff and field commands. The Gillette Report, formally the Air Force Plan for Simplifying Administrative Procedures for the ICBM, proposed many managerial innovations. The most significant was the establishment of special ballistic missile committees at the Department of Defense and Air Force levels (respectively, OSD-BMC and AFBMC)as single-point-of-contact and decision-making bodies.. Another was the concept of an initial operational capability, with all aspects--planning, programming, development, training, and operations--under the direction of the Western Development Division (WDD) of the Air Research and Development Command (ARDC). On 8 November 1955, Secretary of Defense Charles E. Wilson directed that the mode of operation embodied in the Gillette Report be immediately initiated.

Assignment of development responsibility for the IRBM involved the Joint Chiefs of Staff (JCS) in two months (September-November 1955) of interservice wrangling. It finally worked out a compromise whereby the Air Force would develop the land-based SM-75 Thor system, while the Navy and Army would jointly develop the sea-based SM-78 Jupiter system. The Jupiter was designated as backup to Thor. This solution proved satisfactory to Wilson, NSC, and the Administration, and on 1 December 1955 the President placed IRBM development also in a "highest priority above all others" category. Thus, in about six months, the strategic

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ballistic missile effort had increased from one to four different weapons--Atlas, Titan, Thor, and Jupiter.

Initial Operational Capability, 1955-56

One of the major objectives of the augmented program was the early creation of an initial operational capability (IOC). As explained by the USAF Chief of Staff, Gen. Thomas D. White, on 8 November 1955, the IOC "is envisaged as one which would provide a capability of operationally employing prototype weapons during the latter phases of the development program." WDD received responsibility for putting the force together, although AMC, the Strategic Air Command (SAC), and the Air Training Command (ATC) were to work closely with WDD in their respective functional areas.

The Air Staff initially proposed in December 1955 that the ICBM IOC consist of one wing with three bases, each possessing 40 missiles and 20 launchers. The time element dictated that the bases be "soft," that is, structurally unprotected from nuclear explosive effects. Survival and reaction would depend on dispersion of the launchers, local air defenses, and quick reflex action. White defined the last as a capability for each base to launch 10 missiles within 15 minutes after warning, another 10 within two hours, and the remaining 20 within the following two hours. Schedules provided for 10 operational missiles in place by 1 April 1959 and the entire IOC force of 120 missiles by 1 January 1960.

The IRBM IOC, spelled out in March 1956, called for one wing using three SAC bases in the United Kingdom. A base would house four dispersed,

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soft launching complexes, each with five launchers. There were to be 10 missiles in combat status by October 1958, the whole of the 120-missile IRBM IOC force by 1 July 1959.

WDD, ARDC, and SAC soon pointed out that the plan was impractical from both a technical and an operational standpoint. Basically, the Air Staff schedule meant commitment to production and high production rates before flight-testing had even begun. Moreover, as much as three years of lead time was necessary in some cases for base construction--an area in which little information or experience yet existed.

In May and June, White acknowledged the validity of these criticisms by altering the schedule while still retaining the force objective. He wanted 25 operational ICBM's in place by 1 January 1960 and 120 (80 Atlases and 40 Titans) by March 1961. In effect, the end date had been pushed back 14 months. For the IRBM, White agreed to an end date of July 1960, a year later than his original schedule. Only 30 IRBM's would be ready for "anger" launchings on 1 July 1959 instead of the entire 120-missile force.

The IOC plan and the development plan came under AFBMC scrutiny in July and again in September 1956. On both occasions, Secretary of the Air Force Donald A. Quarles deemed them too expensive and directed their reorientation to a "poor man's approach." The objective was to conserve funds during fiscal years 1957 and 1958 by stretching buildup and end dates into later years. The plans finally gained AFBMC approval in November, after a major reduction in the contemplated force and a

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stretch-out of production rates. Instead of 120 missiles, the ICBM IOC force would contain only 80 missiles (40 Atlases and 40 Titans), operationally deployed by March 1961. An initial increment of one launching complex (three launchers and six missiles) was to be available at the combined training-operational base in March 1959. The IRBM force, now cut in half, would consist of four soft squadrons each possessing 15 missiles and five launching positions (with three launchers at each position). The schedule, however, remained substantially the same: July 1959 as the operational-ready date for the first squadron and July 1960 for the fourth squadron.

The OSD-BMC examined the development, financial, and IOC plans in December 1956 and quickly approved them "in principle." The NSC and the President reviewed and approved them in January 1957. The President warned, however, that his endorsement did not apply to the size of the force or the schedule. It was not until 28 March 1957, immediately after the Bermuda conference, that the President agreed to these two points. He called for the 80 ICBM's and 60 IRBM's "at the earliest practicable date"--a significant change from earlier-stated guidance of "the earliest possible date."

The approved ballistic missile program--only about one-half of that recommended by the Air Force and stretched out to cover the time period originally scheduled for a force twice the size--was in large measure the reflection of prevailing "economy" policies. Certainly, intelligence reports on Russian progress gave little cause for comfort. As early as July 1956, Maj. Gen. Samuel R. Brentnall, Assistant Chief of Staff for

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Guided Missiles, warned that the cuts in the projected IOC force would lead to a serious "missile gap" by about 1960.

Administration Economy Measures, 1957

On the basis of the President's program approval, the Air Force proceeded toward fiscal year 1958 reasonably confident that it had ample support for its objectives. The confidence quickly dissipated as a result of new financial limitations imposed by the Administration. These measures, aimed primarily at keeping expenditures from breaking through the authorized debt ceiling, culminated in a major program reorientation in the summer of 1957.

Despite vigorous Air Force protests, Secretary of Defense Wilson directed that the planned Atlas production rate be dropped from six per month to four. This would delay the completion of the 40-missile Atlas force from March to October 1961, while the first increment of operational missiles would endure a three-month setback from March to June 1959. Wilson initially cut the planned Titan production rate from seven to two per month, sufficient only to support the development program. Subsequently, he allowed planning for a production rate of four per month. On this basis, operational dates for the 40-missile Titan force would be November 1961 (for the first squadron) and October 1962 (for the fourth), some 13 and 15 months respectively behind existing schedules. In part, the projected Titan delay was also attributable to the USAF-DOD decision to employ "hard" facilities (concrete reinforced to withstand explosive effects from overpressures of 100 pounds per square inch).

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Thor became the victim of the long-simmering controversy with Jupiter. Wilson in effect downgraded Thor from a complete weapon-system status (under a concurrent development-production-training-operations program) to only weapon status. Restrictions kept production to two Thors each month, enough only to maintain flight test schedules. Contracts for long-lead items and for ground support equipment were to be suspended or canceled. Thor would remain in this essentially "R&D" status until a special DOD committee had made recommendations and the Secretary of Defense and the President decided whether to put Thor, Jupiter, or a combination of the two into the operational inventory.

Aftermath of Sputnik, October-December 1957

Wilson issued the last of his series of directives concerning the program reorientation on 5 October 1957. One day earlier, the Soviet Union had stunned the world by placing Sputnik I into orbit. This achievement, in the wake of the successful flight test in August of a Russian ICBM, came as a rude shock to the United States. Although some officials in high places made statements to the contrary, most recognized the Russian feats for what they really were and what they signified: concrete proof of the Soviet Union's advanced state of technology, lending credence to earlier claims about its IRBM's and ICBM's.

The Air Force in 1954 and the Administration in 1955 had belatedly recognized the utter necessity for strategic ballistic missiles. But in subsequent years the Administration consistently withheld necessary financial support for the overall program, although the development portion

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did not suffer appreciably in this respect. First, the Administration cut IOC force objectives almost in half. Then, it stretched out the schedules for the reduced forces by periods up to 15 months. Sputnik, coming just at the time of the latest reduction, caused an abrupt reversal in the downward trend.

During the remainder of 1957, Air Force and Department of Defense officials prepared and weighed scores of emergency plans to accelerate and augment the ballistic missile effort. Carried out against the backdrop of vigorous congressional inquiry and tremendous public pressure, the reorientation plans advanced fairly swiftly, if sometimes confusedly.

The first decision concerned Thor. On 25 November 1957, Neil McElroy, Secretary of Defense since 9 October, decided to put both Thor and Jupiter into the operational inventory. After Presidential approval, McElroy publicly announced on 27 November the Administration's decision before the preparedness subcommittee of the Senate Committee on Armed Services.

On the same day, William M. Holaday, McElroy's Director of Guided Missiles, directed the Air Force and Army to proceed with planning to produce and deploy four Thor and four Jupiter squadrons--considerably less than the requirement for 16 squadrons stated by the Air Force and the JCS. The schedule called for a Thor operational squadron by 31 December 1958 (with a limited capability six months earlier), the second by July 1959, the third by October 1959, and the last by March 1960. Jupiter had an identical schedule. Authorized production rates were six per month for Thor and five for Jupiter.

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The Air Force sent its post-Sputnik ICBM proposal to the Secretary of Defense on 14 November. It asked for nine Atlas and eight Titan squadrons, increases of five and four squadrons respectively over existing plans, based on a production rate of six Atlases and six Titans each month. Because of construction, production, or training problems, it was not possible to push forward the operational dates of the first squadrons, but subsequent units could be made available at earlier dates. Thus, the first Atlas complex (3 launchers) would be operational in June 1959 (as before), the fourth squadron by June 1961 (only a three-month advance), and the remainder in hardened facilities between March 1962 and March 1963. For Titan, which had been reduced only the month before to virtually an "R&D" level, the Air Force could advance the date of the first squadron from November to May 1961, the fourth squadron from October to January 1962; the other four could be in place between April 1962 and January 1963. Based on this program, the nation would have an inventory of 83 Atlas and 80 Titan missiles ready to launch by March 1963 instead of the previously planned 40 Atlases and 40 Titans by October 1962. On 12 December, Holaday gave the planning "go-ahead" for a nine-squadron Atlas force but not for a Titan increase.

On 30 January 1958, NSC and the President confirmed the goals of the emergency program. Ballistic missile plans now called for four Thor, four Jupiter, nine Atlas, and four Titan squadrons. Although greater than the pre-Sputnik objective, this force was still below the size and behind the schedule originally proposed by the Air Force late in 1955.

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It provided ample proof that recoupment of lost time was possible only at great expense and effect and at added risk, if at all.

One major management device fell by the wayside as a result of the program reexamination when the Air Force dispersed the unique concentration of IOC responsibilities that had been centered in the Air Force Ballistic Missile Division (AFBMD).* Effective 1 January 1958, SAC, ATC, and AMC assumed major functional responsibilities for "fielding" the operational force. The Air Force retained the objective of the IOC: concurrent effort by the commands to obtain an operational force at the earliest possible date.

Expansion of Plans and Programs, January-June 1958

The augmentation and acceleration plans put into effect in November and December 1957 failed to still the criticism or ease the pressure from Congress and the public. The recent program expansion still appeared to be inadequate in the light of apparent Russian capabilities. In January 1958, NSC asked the Department of Defense for its views, especially in the light of the Gaither Committee report. At the same time, the Air Force was in the midst of numerous studies aimed at enlarging the current programs.[2]

Following a discussion among the top hierarchy of OSD and the Air Force, Secretary of the Air Force James H. Douglas on 10 February formally proposed an ICBM force objective of 9 to 13 Atlas and 8 Titan squadrons, to be available by June 1963. The uncertainty over the number of

*Redesignated from Western Development Division on 1 June 1957.

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Atlas units stemmed from the Air Force's additional proposal introducing a solid-propellant ICBM--the SM-80 Minuteman--into planning discussions for the first time. The Air Force wanted 100 of these in the inventory during fiscal year 1963 and 400 by the end of the next year. However, should technical difficulties prevent the contemplated Minuteman build-up, then four additional Atlas squadrons would be necessary.[3]

A week later Secretary Douglas informally raised ICBM requirements when he sent an Air Staff proposal to OSD for a force of 13 Atlas and 17 Titan squadrons by the close of fiscal year 1963. This was in response to the NSC inquiry concerning the recent Gaither Committee report. Meantime, continued examination of production, training, financial, and operational factors resulted in an alternate formal USAF recommendation on 21 February for 9 soft, instead of 5 soft and 4 hard Atlas squadrons, by June 1962 (an advance of one year over the 10 February proposal) and for 11 Titan squadrons, instead of 8, by June 1963. The force and schedule for Minuteman remained unchanged.[4]

The Secretary of Defense turned to JCS for advice on what ICBM force were required. JCS was beset by major differences of opinion. General White naturally wanted ICBM augmentation of the strategic force. The Chief of Naval Operations, Adm. Arleigh A. Burke, opposed the ICBM expansion, calling instead for an enlargement of the Polaris program. Gen. Maxwell D. Taylor, Army Chief of Staff, maintained that a strategic capability with considerable "overkill" potential already existed and pressed for additions to "limited war" forces and weapons. On 24 February, JCS informed McElroy that it would not make any recommendation

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until the Weapon Systems Evaluation Group (WSEG) completed its current studies on overlap, duplication, and cost effectiveness of the various strategic weapon systems. McElroy in turn told the Air Force that he would take no action on the ICBM proposals pending receipt of JCS recommendations.[5]

Based on tentative conclusions reached by WSEG late in March, McElroy decided not to accelerate or augment further the Atlas program of five soft and four hard squadrons by June 1963. However, he obtained Presidential approval to seek additional funds to speed Titan availability, although keeping the force to the four units; he requested the funds of Congress on 3 April.[6] And there matters stood for the remainder of fiscal year 1958. The Air Force nevertheless continued to plan (but not program) a force objective of 9 Atlas and 11 Titan squadrons by November 1961 and June 1963, respectively.

The IRBM program of four Thor and four Jupiter squadrons was unsatisfactory to the Air Force from the beginning. The major objection was to the duplication of planning, funding, training, and producing involved in two essentially similar missile systems. But congressional pressures would not permit the elimination of Jupiter as desired by the Air Force. Since the eight-squadron force did not meet its needs, the Air Force continued to press for major program alterations. Prospects for authorization of the 16-squadron program appeared brighter in January 1958 after Gen. Lauris Norstad, NATO's military commander, asked for 10 squadrons for NATO (including the 4 in the United Kingdom).

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Early in February the Air Staff formally established the requirement for 16 IRBM units, to be operational by June 1961--an advance of one year over previous plans. On 25 February, Secretary Douglas asked for McElroy's approval, but a stalemate resulted late in March when the JCS reaffirmed its November 1957 position: 16 squadrons by June 1962.[7]

Matters came to a head on 22 April when top OSD and USAF officials discussed all aspects of the IRBM programs. Faced with both financial and oversea base difficulties, they decided to establish a program of 12 squadrons--9 Thor and 3 Jupiter--but for planning purposes only. OSD eliminated one Jupiter squadron, slipped deployment of the other three (slated for France) by several months because of lack of a base agreement, and permitted Thor production to rise to eight missiles per month. The Air Force also gained its objective of speeding up deployment of the non-British Thor squadrons so that the last would be operational by March 1961. The President on 24 April approved the planning changes with the proviso that they would not require additional funds in fiscal years 1958 or 1959.[8]

The accelerated IRBM plan, instituted late in November 1957 and expanded in April 1958, focused attention on the critical problem of bases in the United Kingdom and the NATO countries. Negotiations with the British at the government and military service levels, dormant since the Bermuda conference of 1957, ultimately led to a final USAF-RAF agreement on 26 June 1958. The final agreement, strongly affected by internal British politics, provided that the four British-based Thor units would be RAF-manned,

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] and both governments would have to consent to any "anger" launching.[9]

Negotiations with France for three Jupiter bases were brought to a near halt by the deteriorating French political situation and the assumption of power by Gen. Charles de Gaulle in June 1958. The Air Force cast about for alternate Jupiter bases as well as sites for the fifth and subsequent Thor squadrons, giving consideration to Italy, Turkey, Libya, Spain, Alaska, and Okinawa. Although a Thor unit was scheduled for operational deployment to Italy by July 1959, an unfavorable political climate there kept base negotiations at a standstill. For an alternate site, the Air Force examined Alaska.[10]

Fiscal Year 1959

As fiscal year 1959 opened the Administration (and the Air Force) faced a crescendo of criticism from both Congress and the public The information on Russian ICBM capabilities available to the public accurately reflected classified intelligence reports and apparently exercised a profound effect. The public seemed to want a powerful effort to overcome a missile gap expected to appear late in 1959 and then grow greater in the next few years. There could be little question that the nation's future security rested in part on weapons other than ICBM's or IRBM's. But the disparity between the number of strategic ballistic missiles programmed through 1963 by the United States and those that the Soviet Union could reasonably produce in the same period was so

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great as to cause many people to question the validity of the concept of deterrence and the adequacy of the force behind it.

The solution to the problem of the missile gap raised questions of vital concern to the Air Force in its role of deterrent force. Was there enough time for the Air Force to obtain sufficient Minuteman missiles in four or five years to close the gap? Assuming the success of Atlas and later of Minuteman, should Titan be dropped, with savings going toward the costs of a higher Atlas production rate or speedier Minuteman development? Should both Atlas and Titan be put into accelerated production and the United States attempt to match the Russians during the early gap years? What of the military worth of Atlas and Titan, their effectiveness and survivability; should they be hardened and/or dispersed, and how much? Should Minuteman be put in underground launching silos or placed on railroad cars? Did IRBM's add effectively to American deterrence? If so, what of our European allies' unwillingness to accept them or to make bases available? And what of the potential and proper role of the aircraft-launched ballistic missile, now only an idea undergoing feasibility evaluation? The answers to these and many other questions would determine in large measure the ultimate success or failure of the nation's security policies.

Atlas-Titan

As of 1 July 1958 the Air Force had an official ICBM program of nine Atlas and four Titan squadrons. The Atlas portion called for five soft and four hard squadrons, basically in an undispersed 9x1

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configuration, i.e., all nine launchers and missiles of a squadron constituting a single target subject to destruction by one enemy nuclear weapon. The nine squadrons were to become operational between June 1959 and June 1963; the Titan squadrons between July 1961 and June 1962, but with the 9x1 squadrons hardened to 100 psi. This was the program approved by OSD on 12 December 1957.[11]

Pending since February 1958 was an Air Force proposal for 9 Atlas and 11 Titan squadrons. All Atlas squadrons would be operational by June 1962--an advance of one year for later squadrons over the current schedule. In its fiscal year 1959 development plan, the Air Force recommended on 12 June 1958 a major modification to the February plan. It proposed to alter the composition of the Atlas force as follows: the first two squadrons would remain soft and undispersed, as planned, because of base construction progress to date; the third and fourth would be soft but dispersed in a 3x3 configuration, i.e , three complexes of three launchers each, thereby creating three targets for the enemy; the last five, employing all-inertial guidance, would be deployed in a 3x3 configuration and hardened to 25 psi. The changes involved no major cost increases, would advance the force completion date to April 1962, and would greatly improve the reaction time and survival chances of the Atlas force.

The February proposal on Titan had called for 11 squadrons, all in the concentrated 9x1 configuration and hardened to 100 psi. The last of these squadrons was to be operationally available by June 1963. The

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12 June modification would result in obtaining the fourth of the approved squadrons in June 1962 and the last of the proposed seven additional squadrons in March 1963. This meant a schedule improvement of one year for the approved 4-squadron force and of three months for the proposed 11-squadron force.[12]

Following the presentation of the plan to OSD-BMC on 12 June, a hiatus of more than two months ensued. The only positive action by OSD during that period was to notify the Air Force officially on 3 July that it had approved the 3x3 configuration for the third and fourth Atlas squadrons. In the meantime, the Air Force, concerned over the concentration of Titan launchers, on 18 July approved the 3x3 configuration for all Titan squadrons and informed OSD-BMC on 5 August.[13]

It was not until 19 August that OSB-BMC approved the Atlas portion of the 12 June proposal. Titan did not fare so well. OSD-BMC directed the Air Force to commit only enough funds to maintain Titan at the four-squadron level and schedule, pending completion of a review Holaday had requested five days earlier. Holaday then had asked the Air Force to examine thoroughly the possibility of eliminating Titan and substituting a 13-squadron or 20-squadron Atlas force in lieu of the approved 9 Atlas-4 Titan program and the proposed 9 Atlas-11 Titan program. The scope of the Titan review was greatly broadened by another request from Holaday, on 10 September, for information on USAF ballistic missile plans and programs through fiscal year 1965.[14]

Uncertainty had surrounded the future of Titan for some time. Begun in 1955 as insurance against failure of the Atlas, Titan contained

technical features that promised a considerable improvement over Atlas in range, speed, warhead, and other performance factors. However, the Titan schedules generally lagged behind those of Atlas by one to two years. Faced with this time factor, the on-schedule Atlas development progress, and the exceedingly costly aspects of a dual program, many defense officials questioned the worth or necessity of going on with Titan. This feeling had influenced in part the downgrading of Titan in the fall of 1957 and the subsequent refusal to expand the program after Sputnik.

The evaluation occupied the months of August through November 1958 and officials of the Air Force, OSD, and White House as well as several scientific advisory bodies. There was considerable justification to McElroy's remark that the matter "really got the treatment."

After resolving a strong Air Staff division of opinion, the Air Force decided to continue Titan. Arguments against Titan included the cost, support of two weapon systems instead of one, and the possibility that the eventual growth of Atlas would suffice to do the military and space jobs for which Titan initially seemed better suited. The more important factors favoring Titan were the broader production base, allowing a more rapid force buildup in the near future if circumstances so dictated; the retention of a measure of competition at a time when neither Atlas nor Titan was yet fully proved; Titan's better performance characteristics and growth potential for both military and space purposes; the feeling of confidence stemming from two sources of production;

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and the easier task of obtaining heavily protected (100 psi) launching facilities for Titan as compared with Atlas.[15]

On 13 November 1958, AFBMC reaffirmed its original proposal for a force of 9 Atlas and 11 Titan squadrons to be operationally available by the close of fiscal year 1963. OSD-BMC went along with the findings on 18 November, after hearing the last of a series of Air Force presentations. On 6 December, NSC recommended and the President approved the long-sought expansion. Holaday notified the Air Force on 8 January 1959 of the Administration's consent and asked for revised development plans based on the new ICBM force objective.[16]

The fiscal year 1960 budget presented to Congress on 19 January 1959 included the funds required in 1960 for the expanded 20-squadron ICBM force. The budget submission also rekindled the long-smoldering missile gap controversy, and at a heat far beyond anything that had gone before. Adding fuel to the fire was the Russian claim in November 1958, widely publicized in January 1959, that its ICBM had attained production status. American intelligence estimates, much of their contents soon publicly known, foretold an ever widening missile gap beginning late in 1959 and continuing through 1963.[17]

The Administration defended its position on the missile gap with the contention that the nation's main objective was to deter Soviet attack, not to match the Russians weapon for weapon. This objective could be met by maintaining a force that would have the country's full confidence and would not seriously weaken the economy.[18]

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In the congressional budget hearings that followed between February and May 1959, top Administration, Defense Department, and Air Force officials stoutly defended the President's position. They emphasized that the total of America's deterrent forces was currently far superior to Russian attack forces and completely adequate for the period in question. In their opinion, a comparison of ICBM inventories alone was not particularly meaningful. Moreover, there were some who did not concede the Soviet Union a missile superiority of any great consequence.[19]

The opposition views to the Administration's policy came primarily from Democratic members of Congress. A large segment of the American press and a number of USAF field commanders lent support to these views. They contended that the American deterrent forces were deteriorating day by day. More importantly, these forces were not being improved, modernized, or built up at a rate commensurate with those of the enemy. Although the Administration opponents agreed that the United States apparently possessed an adequate deterrent force in 1959, they thought the nation would face an extremely critical period in the missile gap years between 1960 and 1964. With only marginal warning and detection systems at hand and no adequate air defense weapons to counter enemy ballistic missiles, the temptation for the Russians to attack would be great and the elimination of virtually all of our retaliatory forces was a distinct possibility.[20]

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In the end, the Administration was able to maintain its basic position during the springtime hearings and gain a reluctant agreement from Congress to go along without major change. However, the controversy had also set off a new rash of studies within OSD and the Air Force that might lead to an improved Atlas-Titan program, an accelerated and augmented Minuteman development program, and renewed interest in the air-launched ballistic missile (subsequently designated Skybolt).

In anticipation of congressional calls for an expanded Atlas-Titan program, the Air Staff and AFBMD had prepared several plans that were reviewed by Secretary Douglas and his staff late in January and early in February 1959. Shortly after, the House Committee on Armed Services and the House Committee on Appropriations asked for pertinent data on the possibility of matching the Soviet Union missile for missile during the projected gap years.[21]

AFBMD and the Air Staff quickly revised their plans to include the missile-for-missile possibility, based on the latest National Intelligence Estimate of Russian capabilities. AFBMC reviewed the revised plans on 25 February and approved them for presentation to McElroy and OSD-BMC without formal USAF recommendations.

The several alternate plans for Atlas ranged from a modest expansion of 3 squadrons to a major one of 17 squadrons. And a twelfth Titan squadron might also be added. However, it appeared that the United States could not match the Russian potential ICBM inventory through fiscal year 1963 without taking the calculated risk of putting Thoric, basically the Thor-Able combination employed in long-range

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nose-cone testing, into production. After the critical period, large-scale Minuteman production was expected to even the ICBM imbalance.[22]

McElroy and top members of his staff reviewed the several plans on 3 March and then asked for formal Air Force recommendations on a future course of action. Based on the previous AFBMD studies, SAC's strong endorsement of the largest possible program, and the findings of the USAF Force Estimates Board, the Air Staff within the week had coordinated and forwarded recommendations to General White and Secretary Douglas. After a month's deliberation and study, Douglas forwarded the Air Force proposal to McElroy on 14 April.[23]

The Air Force emphasized that its views stemmed from overall national objectives. More specific considerations included the latest intelligence estimates of Soviet capabilities, recent USAF actions to improve the operational effectiveness of its ICBM and other weapon systems, the current state of world affairs, and the desirability of making maximum use of Atlas production facilities as a hedge against possible Titan and Minuteman slippages. However, any attempt to match the Soviet Union by resorting to a "crash" program with current limitations on funds would inevitably degrade the Atlas system and result in little real gain in overall military strength.

With these factors in mind, the Air Force recommended a possible four-pronged expansion. Atlas forces would increase to 17 squadrons by June 1963. In addition, the Titan force would be expanded to 12 squadrons, Minuteman would be accelerated to permit an operational inventory of 150 (3 squadrons) by June 1963, and 6 Thoric squadrons would be created but only if deemed politically necessary.

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Should the expansion program gain acceptance, Atlas and Minuteman would require a fund augmentation of about $365 million during fiscal year 1960. Total increase in funds for these two and Titan for fiscal years 1960-63 would be $3.725 billion. Thoric involved about $757 million for fiscal years 1959 through 1961.*[24]

OSD took no immediate action on this proposal and apparently contemplated none. Deputy Secretary of Defense Quarles so reported to Congress, indicating that defense officials were satisfied that the 9 Atlas-11 Titan program was still adequate in combination with other deterrent forces. At congressional request, however, OSD submitted the contents of the USAF proposal to Congress on 6 May. Several days later, the Air Force Council recommended and General White approved the Atlas-Titan-Minuteman expansion as a part of the USAF objective force structure for the 1959-70 period. On the same day, USAF and OSD officials agreed to tool up the Convair plant at a cost of less than $3 million for an Atlas monthly production rate of 12, although keeping actual output to the current rate of 8.[25]

Early in June, while still awaiting a decision on the four-pronged expansion proposed on 14 April, Douglas authorized the expenditure of limited funds to protect the validity of the 17-squadron Atlas program schedules. He stated that he would continue to take similar actions as required pending acceptance or rejection of the plan. Shortly after, the House of Representatives in effect endorsed the USAF plan by adding $85

*For a discussion of the Minuteman portion of the 14 April proposal, see below pp 37-38

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million to the Atlas budget request as a fiscal year 1960 downpayment on the eight additional squadrons and $77 million to accelerate Minuteman development.[26]

On 15 June, McElroy informed the Senate, still in the midst of its budget deliberations, that he did not consider the House action as a mandate to accelerate the ICBM program. He noted that most of the additional Minuteman money would probably be used but that the Atlas money would not, at least not currently.[27] And there matters stood at the close of fiscal year 1959.

While the ICBM's underwent minute policy examination, the Air Force undertook to reduce the vulnerability of the missile squadrons. The first of these measures, approved by AFBMC on 4 February 1959, was the conversion of the fifth and sixth Atlas squadrons from a 3x3 to a 1x9 configuration. This meant that each squadron would have nine dispersed sites instead of three. The 1x9 configuration was not a new idea; it had been kept on the shelf for some time because of fund limitations. Now, with certain changes in equipment and facilities, the 1x9 concept could be applied at a cost of only $4 million per squadron. On the other hand, survivability increased by a factor of three: whereas 27 of a given type of enemy ICBM's were required to wipe out a 3x3 squadron, 81 would be needed to eliminate a 1x9 squadron.[28]

At the same time that AFBMC approved the 1x9 configuration, the committee also directed the use of 100-psi-hardened underground silos (as for Titan) for the seventh and subsequent Atlas squadrons. Further study

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disclosed that this was not possible without delaying the seventh squadron's operational date. Lack of an OSD decision on the silo later forced a deferral of hardening to 100 psi of the eighth squadron also. So the Air Force could plan on hardening both squadrons only to the original 25 psi.[29]

Thus at the close of fiscal year 1959, Atlas plans, if approved by the Administration, would result in the following force structure:[30]

Number of Squadrons	Type of Guidance	Configuration	Extent of Hardening	Operational Date
2	Radio-Inertial	6x1	--	Jun 59 - Mar 60
2	Radio-Inertial	3x3	--	Aug 60 - Nov 60
4	All-Inertial	1x9	25 psi	Jun 61 - Jan 62
9	All-Inertial	1x9 (silo-lift)	100 psi	Mar 62 - Jun 63

As noted earlier, the Air Force had intended for several years to ready the first complex of three Atlas missiles for emergency operational use in June 1959. Until mid-April 1959 the Air Force appeared confident of attaining this goal. A series of Atlas flight tests beginning with the first "D" missile (IOC configuration) then went awry. Although AFBMD and an ad hoc group from the ICBM Scientific Advisory Committee to the Secretary of Defense for Ballistic Missiles labeled these as primarily random failures, the need to evaluate and incorporate "fixes" caused deferral of the scheduled operational date from June to late August 1959.[31]

As with the Atlas, the Air Force sought to improve the survival and reaction characteristics of the Titan. AFBMC approved on 18 July

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1958 a change from an undispersed 9x1 to a 3x3 configuration for the 11 programmed squadrons.[32] Other measures strongly recommended during the year included a shift to all-inertial guidance and the 1x9 configuration, launching from silos, and employment of storable or noncryogenic propellants.

Shifting from the radio-inertial to all-inertial guidance would facilitate a change from the 3x3 to the 1x9 configuration. Based on operational availability schedules, it appeared feasible to make the change with the construction of the seventh Titan squadron base, due to be completed in October 1962. In line with this change, the Air Force later proposed to eliminate the elevator and to launch directly from the Titan silo. The advantages were many: less missile exposure time, no costly elevator installation or maintenance, reduced complexity and consequently greater reliability, and faster reaction. The Air Force incorporated these changes into its augmentation proposal of 14 April 1959 and as a supplement to the fiscal year 1960 development plan.[33]

The possibility of employing storable or noncryogenic propellants, thereby permitting almost constant alert and instant launchings, had been under study for many months, but the combination of high cost and likely slippages in operational availability worked against immediate acceptance. On 13 August 1958, AFBMC, while formally noting the many technical and operational advantages of this type of fuel, directed continuance of development activity only and asked for a new proposal by February 1959.[34]

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AFBMD's proposal to AFBMC on 25 March 1959 called for the use of the noncryogenic propellant with the seventh and subsequent Titan squadrons. The committee agreed with the findings, but because of lack of funds, directed that only development of the subsystem continue. Subsequently, the ballistic missile scientific advisory committee and SAC strongly endorsed AFBMD's proposal. However, this improvement, too, continued to mark time pending resolution by the Administration of the fiscal year 1960 budget and the overall ICBM program augmentation.[35]

As matters stood at the close of the fiscal year, there appeared to be insufficient money for Titan to maintain its approved schedule, let alone the several proposed improvements. The USAF proposal of 14 April, still being studied by OSD and the Administration, was as follows:[36]

Number of Squadrons	Type of Guidance	Configuration	Extent of Hardening	Operational Date
6	Radio-Inertial	1x9 (silo-lift)	100 psi	Jun 61 - Aug 62
6	All-Inertial	1x9 (in-silo)	100 psi	Oct 62 - Jun 63

Minuteman

The Air Force viewed the solid-propellant SM-80 Minuteman as its best bet to close the missile gap by 1963 or 1964. It expected even more from Minuteman, believing that it could reverse for the first time the unfavorable trend toward more costly succeeding generations of weapon systems. Minuteman would cost less to develop, be the first missile truly amenable to mass production techniques, and be simple and inexpensive to

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operate and maintain in terms of both manpower and money. Perhaps as important, the Air Force regarded Minuteman as the best means of challenging the successful incursion of the Navy's Polaris into the strategic warfare area and the increased funds accorded it from a money "pie" that remained substantially unchanged.[37]

Minuteman studies, begun late in 1955, had progressed to a point by the end of 1957 where the ballistic missile scientific advisory committee could recommend the start of a development program. At a meeting with OSD officials on 8 February 1958, USAF representatives first broached the idea of developing Minuteman, and McElroy agreed. On 21 February the Air Force formally established Minuteman as part of its planned ballistic missile force objective for the period through fiscal year 1964, specifying an operational goal of 100 missiles in fiscal year 1963 and 400 in the following year.[38]

Holaday quickly approved the project but restricted activity to research and development alone--unlike the streamlined method of concurrent development, production, construction, etc., applied to Atlas, Titan, and Thor. Although not completely happy with the arrangement, the Air Force pressed forward, preparing a suitable development plan and obtaining a team of contractors. OSD approved expansion of rocket-engine facilities but refused Minuteman a top rating on the Department of Defense Master Urgency List (MUL) late in June 1958.[39]

The USAF Minuteman development plan for fiscal year 1959 called for $210 million, a weapon system approach, and a limited operational status by July 1962. The plan also warned that funds for production facilities

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were not included. If these facilities were not built before July 1959, deployed Minuteman missiles (prototypes rather than true operational missiles) would total only 42 by the close of fiscal year 1963 and 114 the next year, as against the planned figures of 100 and 400, respectively. AFBMC approved the plan on 18 July 1958 for presentation to OSD-BMC.[40]

At about this time the Air Force obtained support for Minuteman from two different sources. On 24 July an ad hoc group of the scientific advisory committee strongly recommended to Holaday that Minuteman proceed on a weapon system basis. Several weeks later, the Weapon Systems Evaluation Group in a study of various weapon systems pointed to Minuteman as far superior to any other missile from the standpoint of cost effectiveness. Additional support had also come from Congress, which had increased the project's appropriation from $50 million to $140 million.[41]

On 11 August, Douglas formally asked for approval of the Minuteman plan, adding that the Air Force would reprogram from its own resources the $70 million required to bring the total up to the planned figure of $210 million. However, only four days earlier, Holaday, disturbed by the multiplicity and costliness of ballistic missiles in production or nearing production, had turned to JCS for advice on Minuteman's future. He wanted to know the necessity for the missile, its cost effectiveness and military worthiness, and the urgency of the proposed IOC date of July 1962--all this in the light of other missile and aircraft systems to be available in the same period.[42]

The Joint Staff was unable to formulate a reply for JCS. It appeared to USAF planners that Army and Navy representatives were delaying

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an answer quite deliberately, demanding special studies on the several points raised by Holaday and proposing drastic changes in Minuteman's concept of operation, that is, the use of hardened underground silos.[43]

Faced with the impasse in the Joint Staff, with growing pressures from within the Air Force to push Minuteman as the "gap filler," and with OSD's indecision on the fiscal year 1959 program (which had begun to affect development), the Air Staff cast about for alternate courses of action. Then, without warning and notwithstanding the lack of JCS advice, Holaday acted. On 17 September 1958 he censured the proposal for a $210 million program, finding it unjustified because it constituted an eightfold increase over the previous year's program and was not the desired orderly development but rather almost a crash program. Holaday authorized the Air Force to proceed with a program of about $100 million in fiscal year 1959--of which one-half would come from the President's budget and the other half from USAF internal reprogramming. Under no circumstance could the Air Force use the additional $90 million provided by Congress.[44]

Holaday's admonition fell on deaf ears. The Air Force remained firm in its belief in the urgent requirement for Minuteman. It appealed for authority to expand engine facilities essential to both development and production. When refused at the lower levels within OSD, Douglas took the request directly to Quarles and gained his assent on 11 October 1958. The Air Force also reopened the matter of a top MUL rating for Minuteman, but Holaday, after more than a month of

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waiting, on 6 November turned the question over to JCS, to be considered along with the points raised in his request of 7 August.[45]

At this point, in November 1958, Minuteman still lacked an approved development plan, permission to proceed on a weapon system basis, and the urgently required top MUL rating. When the Air Staff proposed to put new pressures on the Joint Staff, both White and Douglas agreed that the time was not propitious but might come "fairly soon." The appropriate time came two weeks later, on 22 November, when USAF representatives, briefed Quarles and Holaday on Minuteman's status. Based on progress to date, Holaday on 8 December 1958 approved a "weapon system" label for Minuteman and allowed activity to proceed under a high priority. He cautioned that his directive restricted the Air Force to planning activity only in the operational construction, production, training, deployment, and subsequent phases.[46]

With the upgrading of its status, Minuteman was undergoing review for possible increases in financial support. On 25 November, in presenting a development plan based on Holaday's fund limitation of $100 million, AFBMD reported that the restriction would cause a slippage of four to five months and a substantial increase in fiscal year 1960 financial requirements. Moreover, if OSD failed to approve the plan by 1 January 1959, still further slippages were inevitable.[47]

Based on the encouraging results of the 22 November meeting with Quarles and Holaday, USAF officials decided to revise the plan and seek authorization for $184 million. They would obtain the additional sum

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of $84 million as they had done before--by reprogramming. The congressional add-on of $90 million still could not be touched. AFBMC approved this scheme on 9 December and presented it to OSD-BMC two days later. Holaday notified the Air Force on 7 January 1959 that OSD-BMC had approved the plan "in principle" with one major exception--it was not feasible to establish July 1962 as a firm initial operational date.[48]

The Air Force had succeeded in pressing ahead with Minuteman, albeit at great expense to other projects. On the other hand, still pending since early August 1958 was a JCS position on the necessity for Minuteman, especially the size and timing of the USAF program. In December 1958 the Joint Staff had completed a first draft of recommendations, but Army and Navy opposition was so strong that the Joint Staff prepared two subsequent drafts in January and the Operations Deputies made still other revisions before JCS could agree.

Initially the Joint Staff took the position that Minuteman constituted a great step forward, that development should proceed apace but without interference to other missiles, and that it should have a top MUL rating. The staff did not think, however, that the initial capability date of mid-1962 was critical. Army opposition was primarily on financial grounds. At first, the Army was agreeable to Minuteman provided Titan development ceased. Subsequently, after the ICBM augmentation of January, the Army supported Minuteman except for the MUL rating and authorization of funds for production facilities. The Navy found little good about Minuteman and doubted that it could even reach

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limited operational status by fiscal year 1965. Moreover the Polaris seemed far better suited for the solid-fuel ICBM role and would be almost invulnerable.[49]

The JCS report to McElroy on 19 February 1959 stated that an early Minuteman capability was "an important military requirement" but specified no operational date other than "as soon as possible" without a crash program. JCS promised to give its views on production buildup and force levels at a later date.[50] In the final analysis, JCS had supported actions already taken by OSD officials and put off for future determination the principal questions raised by Holaday more than six months earlier.

The congressional hearings in the early months of 1959 and the demands for augmented programs to match the Russians afforded the Air Force another opportunity to push for a definite and accelerated Minuteman force objective. Such an objective became a part of the augmentation and acceleration plans (calling also for 17 Atlas and 12 Titan squadrons) drawn up and studied by USAF and OSD officials during January-April 1959.

AFBMC and McElroy concurred generally in an expanded Minuteman plan formally proposed by Douglas on 14 April. This plan provided for a force of 150 Minuteman missiles by the end of fiscal year 1963 (with a limited operational capability at the start of the year), 445 by January 1964, and 800 by June 1964. The increase was 50 over the earlier tentatively projected force level for fiscal 1963 and 400 for the following year. Such an expansion would involve a sizable addition to

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the programmed fiscal year 1960 budget and a total addition of $2.215 billion to current estimates for fiscal years 1959-64.[51]

On 12 May 1959, AFBMC reviewed and approved a revised development plan based on the expansion proposed by Douglas a month earlier. Just before leaving for the Geneva disarmament conference a week later, McElroy verbally gave the "go-ahead" to the plan except as it pertained to production. Holaday provided the formal authorization on 1 June, emphasizing that OSD would make no production decision until sometime between October 1959 and April 1960 (dates that the Air Force had indicated as the deadline) and would depend upon force-level advice from JCS.[52]

Deputy Secretary of Defense Thomas S. Gates, Jr., on 29 June asked JCS for its views on projected Minuteman force levels and buildup rates. Previous expressions of opinion by the services indicated that obtaining agreement would probably be a lengthy process. In its review on 8 June of estimates of required forces for fiscal years 1961-63, JCS had identified Minuteman as an area of disagreement. Although Admiral Burke had agreed on a 150-missile force in fiscal year 1963, he thought the missile should be made mobile instead of being static in underground silos. The Army Chief of Staff felt the 150-missile objective was over-optimistic by 200 percent.[53]

By the end of fiscal year 1959, Minuteman's position had improved greatly over that of a year before. The missile had gained considerable support at all levels, and both the Air Force and Congress regarded it

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as an optimum weapon. On 12 May 1959, General White had noted the urgent need of building a missile force large enough to validate Air Force strategic doctrine in the coming years. He established an objective force of 60 Minuteman squadrons (3,000 missiles) for planning purposes through fiscal year 1970. Congress indicated its support of Minuteman early in June, when the House on its own voted the additional funds required in fiscal year 1960 to finance the expanded program. McElroy told the Senate on 17 June that the Administration was agreeable to the action.[54] Minuteman prospects were indeed bright.

One major change in the proposed deployment of the Minuteman force occurred during the year. Originally, the Air Force planned to site the missiles in unattended, hardened underground silos, but it soon initiated studies for placing them on railroad cars. In part, the Air Force was impelled to this direction by Navy criticism of Minuteman's susceptibility to pinpoint attack in contrast with the invulnerability of the mobile Polaris. SAC was especially insistent on gaining mobility for Minuteman, and on 12 February 1959 it submitted a qualitative operational requirement (QOR) to Headquarters USAF asking for the first mobile operational unit by January 1963. General Power reemphasized SAC's requirement on 3 March, claiming that "the mobile missile force offers the greatest advantages during the time period when the U.S. is missile limited." He proposed that the "railroad" version of Minuteman be given first priority to insure an operational force of 50 to 100 by July 1963.[55]

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Advantages of a mobile system were quite obvious and most attractive, but technical and operational studies by AFBMD and SAC revealed several unsolved major operating and logistical problems. After due consideration, AFBMC, with Air Staff support, approved on 1 May the mobile concept as complementary to the primary objective of a dispersed and hardened Minuteman. The committee also approved the projected January 1963 operational date for the first mobile unit but asked for more definitive studies on the size of the mobile force. OSD-BMC agreed on 1 June.[56]

Thor-Jupiter

At the beginning of fiscal year 1959, the IRBM force objective included nine Thor and three Jupiter squadrons. Of these, the Administration had approved programming actions on four Thor units for the British (with operational attainment dates between December 1958 and March 1960) and three Jupiter units for France (with operational target dates between February 1959 and March 1960). Locales for the other five Thor squadrons were uncertain, although tentative plans called for Italy, Turkey, Alaska, and Okinawa. The refusal by the De Gaulle government in June 1958 to accept Jupiter, however, had clouded the question of where the Jupiter and later Thor squadrons would be sited.

The summer of 1958 saw little progress in clearing up the matter of bases in NATO nations, although the Italians indicated in principle a willingness to accept two squadrons. During the same period, in order to protect production and deployment schedules, OSD approved the programming of a fifth Thor unit but restricted commitment of funds to

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long-lead items. Influenced by the continued reluctance of European countries, budgetary pressures at home, and good progress by the Atlas, OSD began considering the reduction of the planned IRBM force. On 20 October, Quarles asked JCS to reexamine the necessity for the planned IRBM force.[57]

The Joint Staff recommended the retention of the dozen IRBM squadrons, arguing that they constituted the most austere, militarily acceptable program and suggesting Spain and Greece as likely alternate base sites. On 31 October, JCS reversed completely the Joint Staff position because of the discouraging financial and oversea base prospects and recommended an IRBM force of only eight squadrons.[58]

At a press conference two weeks later, McElroy remarked that he saw little future importance to land-based IRBM's, adding, "The farther you go down the road toward an operational capability of the ICBM, the less interesting it is for us to deploy additional ones of the IRBMs . . . ." On 4 December, NSC recommended and the President approved a program of five Thor and three Jupiter squadrons. Since the "order" date for additional Thor squadrons was some months away, the door remained open for additional deployment should there be an about-face on base rights by any of the NATO countries.[59] The President's decision effectively ended the two-year controversy over whether the Thor or Jupiter should go into production.

During the period of reprogramming, the Air Force and RAF continued to push deployment of four Thor squadrons to the United Kingdom. The

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first unit was to be operational in December 1958, with the other three coming along in June and October 1959 and March 1960, respectively. This schedule, established in November 1957, constituted an advance of about one year over previous schedules and was never met.

By means of a tremendous airlift effort beginning in August 1958, the Air Force successfully moved the requisite materiel. But construction difficulties (under British control), insufficient crew training (due to compressed schedules), and a totally unrealistic allowance of 15 (instead of the required 165) days to install and check out the missile and support equipment combined to wreck the schedule. Moreover, under terms of the agreements, the British had the authority to decide when a squadron was operationally ready. Thus, after the Air Force completed work on a position or complex and declared it ready, the British took over and promptly relegated the position to training status.[60]

This procedure led to optimistic claims by top defense officials and controversy with congressional leaders. For example, as late as 1 December 1958, Douglas informed a Senate committee that a Thor squadron would be operational within 30 days, as scheduled. Almost two months later, on 23 January 1959, Twining told a House committee: "We have them /Thors/ sitting there and ready to go." And there were many similar claims in subsequent months. When finally nailed down by congressional committees, McElroy on 30 April candidly admitted, ". . . none of these missiles /Thors/ is ready for immediate countdown and firing." He added that it was up to the RAF to decide and announce

when Thor was operational. A week later, Douglas also clarified his earlier remarks, reporting that currently "quite a few hours" were needed to ready and fire a Thor. However, Thor would have a reaction time of 15 to 20 minutes once the RAF completed squadron training and returned the missile to operational status.[61]

What then had been the real situation? As of 31 December 1958, missiles had been installed on 7 of 15 emplacements of the first squadron. Two of these seven actually possessed an interim offensive capability, granted several hours of preparation. The Air Force turned over to the RAF the first complete Thor squadron on 6 June 1959, almost six months behind schedule. Plans for subsequent squadrons had slipped three, two, and one months, respectively, to September and December 1959 and April 1960. Finally, the projected fifth Thor squadron was still without a home and had been rescheduled from a December 1959 operational date to July 1960.[62]

Jupiter failed to show much progress during fiscal year 1959. Originally placed on a deployment schedule duplicating that of Thor, the Jupiter program soon floundered in a sea of uncertainty over base sites and funding. [redacted]

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The United States was also discussing with Turkey and Greece the possible location of the third Jupiter squadron.[63]

Lack of agreements made deployment schedules conjectural. After a time, the Air Force gave up setting specific dates of deployment and turned to planning and scheduling actions and objectives on the basis of a given number of days. Thus, under the latest plans, the Air Force intended to deploy the first Jupiter within 190 days of "go-ahead."[64]

Air-Launched Ballistic Missile

During 1958-59 the XGAM-87 air-launched ballistic missile (ALBM), later named Skybolt, emerged as a likely rival of the surface-launched ballistic missile. Unlike the ICBM and IRBM, the aircraft carrying the ALBM could be recalled or diverted after dispatch. In the ALBM, the Air Force felt that it could combine the best performance features of the ballistic missile with the operational flexibility of the aircraft.[65]

As General White pointed out, the ALBM would "give us a capability to maintain a constant patrol of the free world skies" without fear of being neutralized by enemy measures. With the ALBM's reach of 1,000 to 1,500 miles, an aircraft could bomb without approaching a heavily defended target. Several top defense officials also expressed enthusiasm for the contemplated system. One Army officer, Brig. Gen. Austin W. Betts, OSD's Deputy Director of Guided Missiles, stated that the ALBM would "keep manned aircraft effectiveness at high levels for an indefinite period as far in the future as one can foresee at this time."

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The Special Assistant to the Secretary of Defense, Oliver M. Gale, Jr., predicted that by 1963 SAC bombers equipped with ALBM's would be America's "major instrument" of retaliation against the Soviet Union. This aspect was of immense significance, since an ALBM could easily extend the useful life of the nation's largest and most costly strategic asset--bombardment aircraft.[66]

The Air Research and Development Command first issued a call for feasibility investigations of the ALBM on 17 October 1957. Martin and the Lockheed-Convair team proposed flight test projects to check the potential of their approaches. Early test launchings from a B-47, and later from a B-58, were most encouraging.[67]

White stated on 1 July 1958 that he considered it "of extreme importance that the Air Force have a suitable ballistic ASM /air-to-surface missile/ at the earliest possible date." He directed the USAF Aircraft and Weapons Board, "as a matter of urgency" to determine ALBM availability and capability and to present recommendations to the Air Force Council "as soon as possible." On 6 November, following completion of the study, the Chief of Staff approved the start of ALBM development. For use initially on SAC's subsonic bomber fleet, he wanted an operational ALBM in 1962 with a range of not less than 1,000 miles and a small CEP. Such a missile, White noted, would complement strategic forces at a time when only a small number of ICBM's and IRBM's would be available.[68]

Just before the close of 1958 the Air Force briefed Holaday and his staff on ALBM plans. Holaday agreed that the ALBM, if fully

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effective, might well add a new dimension to strategic airpower and affect profoundly the overall force structure. But he directed the Air Force to go slowly in its financial commitments pending a JCS evaluation of ALBM cost effectiveness and impact on other strategic systems. Since selection of a contractor involved little in the way of funds, on 12 January 1959 the Air Staff directed ARDC to begin a competition and 10 days later issued a General Operational Requirement (GOR) for the missile.[69]

The JCS examination of ALBM became as controversial as the Minuteman evaluation. Initially, WSEG conducted a study and reported on 13 March that it could not provide valid ALBM data inasmuch as bid proposals were not due from industry until 16 March. The Joint Staff then recommended that JCS simply state that if developed on time the ALBM would enhance the deterrent forces. Both Army and Navy planners took exception, demanding that JCS make only a noncommittal reply until more data became available.[70]

Following an ALBM briefing on 1 April by the Air Force, JCS again took up the matter. General White wanted the reply to state that the ALBM would significantly increase aircraft effectiveness and operational flexibility and that development should proceed through a prototype version. The Army and Navy chiefs took a position tending to throw doubt on ALBM requirements because of a lack of information. General Taylor went further, decrying the possibility of prolonged dependence on aircraft.[71]

When a number of meetings failed to resolve the differences, White called on 14 April for submission of a "split" reply. Three days later,

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JCS sent divided recommendations to OSD. The Air Force chief, generally supported by JCS Chairman Nathan F. Twining, proposed priority development through prototype testing, withholding to a later date a decision for production. His Army and Navy counterparts admitted the ALBM potential but doubted the projected schedule and costs and questioned the need to extend the life of the strategic aircraft. They called merely for additional study prior to a development decision. Possibly for dramatic effect, the Army-Navy statement translated the Air Force's development cost estimate from $190 million to "1/5 billion" dollars.[72]

The split influenced OSD officials to project a delay of about six months on the ALBM development decision. On 24 April 1959, Quarles limited USAF contractual obligations to the acquisition of technical data. He also asked JCS to have ready by the fall its findings on ALBM cost effectiveness. The Air Force completed its competition early in May, selected Douglas Aircraft Company as contractor, and briefed the Director of Defense Research and Engineering, Dr. Herbert F. York, on available technical, cost, and operational features. York subsequently allowed the Air Force to proceed with contractual negotiations restricted basically to design studies, pending a decision on development that he expected to make sometime in October.[73]

Outlook for the Future

Some months after the close of fiscal year 1959, during House hearings on the fiscal year 1961 budget, General White was asked if the "so-

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called ICBM gap" was the result of deliberate U.S. policy. He replied that it was. He added, moreover, that he had no regrets that we had not kept pace with the Soviet Union, missile for missile, since our lead in aircraft more than compensated for the expected numerical deficiency in the ICBM area.

White's comments were in consonance with the President's policy enunciated in October 1958--a policy maintained despite tremendous criticism and pressures. But during fiscal year 1959 the Air Force nevertheless continued to seek accelerated, augmented, and improved Atlas and Titan programs and looked to Minuteman and the air-launched ballistic missile to overcome the missile gap by 1963-64. Prospects to this end were good, for both the Atlas and Titan programs had been augmented or accelerated and additional programs and changes stood an excellent chance of acceptance by the Administration. Despite divided JCS opinion, Minuteman had made excellent progress in fiscal year 1959, and expectations for the air-launched ballistic missile were optimistic. The IRBM's, Thor and Jupiter, had mastered most of their problems and were ready to join the active arsenal of USAF weapons.

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1. The first 14 pages are based upon a historical study, Plans and Policies for the Ballistic Missile Initial Operational Capability Program (S), written by Max Rosenberg and issued by the USAF Historical Division Liaison Office, February 1960.

2. Report of the Preparedness Investigating Subcommittee, Senate Committee on Armed Services, 23 Jan 58; AFPC Advice of Action (S), subj: Evaluation of Offensive and Defensive Weapon Systems, 30 Jan 58; memo (S) for C/S from Brig Gen C. M. McCorkle, AC/S(GM), subj: Status of the Ballistic Missile Programs, 24 Jan 58; Minutes (S), 14th AFBMC Mtg, 6 Feb 58.

3. Memo for Record (S) by Col R. E. Soper, Bal Div, AC/S(GM), subj: Secretary of Defense Review of Air Force Ballistic Missile Proposals, 10 Feb 58; memo (S) for SOD from J. H. Douglas, SAF, subj: Air Force Ballistic Missile Objectives, 10 Feb 58.

4. Memo (TS) for D/GM, OSD from Douglas, subj: Report to the President by the Security Resources Panel of the ODM Science Advisory Committee (Gaither Report), 17 Feb 58; memo (S) for D/GM, OSD from McCorkle, subj: Ballistic Missile Force Objective, 21 Feb 58; AFC 10/301 (S), subj: Ballistic Missile Programs, 24 Feb 58.

5. Memo (S) for JCS from N. McElroy, SOD, subj: Air Force Ballistic Missile Objectives, 14 Feb 58; JCS 2101/295 (TS), 24 Feb 58; memo (TS) for SOD from JCS, subj: Report to the President . . . , 24 Feb 58.

6. Memo (TS) for SOD from JCS, subj: Augmentation of the Present ICBM and POLARIS Submarine Weapons Systems, 9 Apr 58.

7. Memo (TS) for SOD from JCS, subj: FY 1959 Budget, 17 Nov 57; Air Staff Summary Sheet (TS), Maj Gen H. C. Donnelly, Asst DCS/P&P to VC/S, subj: Air Staff Position on IRBM Deployment, 30 Jan 58; memo (TS) for SOD from Douglas, subj: IRBM Program, 25 Feb 58; memo (TS) for SOD from JCS, subj: IRBM Operational Status, 28 Mar 58.

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9. History, 7th Air Div, SAC, 1 Jan-30 Jun 58, pp 62-86 (S).

10. Memo (S) for SOD from Douglas, subj: Deployment of the JUPITER, 12 Apr 58; Memo for Record by Waggoner, 23 Apr 58; msg (S), 50070, C/S to AFBMD, 26 Apr 58; memo (S) for all Deputies et al. from Col R. E. Soper, Bal Div, AC/S(GM), subj: Revised IRBM Program; Minutes (S), 19th AFBMC Mtg, 11 Jun 58; ltr (S), Gen Donnelly to Dep Comdr, USAFE, subj: IRBM Program, 19 Jun 58; memo (S) for D/Plans from Brig Gen H. T. Wheless, WPD, subj: Status of IRBM Deployments and Negotiations, 3 Jul 58.

11. Memo (S) for SOD from Douglas, subj: FY 1958 Supplemental and FY 1959 Package Augmentation, 14 Nov 57; memo (S) for AFBMC from Holaday, subj: Acceleration of ATLAS ICBM Program, 12 Dec 57.

12. Memo (S) for D/GM, OSD from McCorkle, 21 Feb 58; AFBMD Development Plan (S), 20 May 58; Minutes (S), 19th AFBMC Mtg, 11 Jun 58; memo (S) for OSD-BMC from Douglas, subj: Submission of the 20 May 1958 BMD Development Plan, 24 Jun 58.

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31. Memo (S) for Spec Asst to SOD from Brig Gen R. E. Greer, AC/S(GM), subj: Flash Test Report on Launch of Atlas 3D, 15 Apr 59; Report (S) of Ad Hoc Group of the Scientific Advisory Committee to the Secretary of Defense for Ballistic Missiles, 17-18 Jun 59; memo (S) for SOD from MacIntyre, subj: Status of ATLAS IOC, 24 Jun 59.

32. Minutes (S), 21st AFBMC Mtg, 18 Jul 58.

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43. Memo (S) for C/S from Wheless, subj: MINUTEMAN Program, 6 Nov 58.

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AAF	Army Air Forces
AC/S(GM)	Assistant Chief of Staff, Guided Missiles
AFBMC	Air Force Ballistic Missiles Committee
AFBMD	Air Force Ballistic Missile Division
AFPC	Armed Forces Policy Council
ASSS	Air Staff Summary Sheet
Bal	Ballistic
D/DRE	Director of Defense Research and Engineering
D/GM	Director of Guided Missiles
DOD	Department of Defense
D/Ops	Director of Operations
D/Plans	Director of Plans
IOC	Initial Operational Capability
Mat	Materiel
Mtg	Meeting
MUL	Master Urgency List
NSC	National Security Council
OSD-BMC	Office of Secretary of Defense Ballistic Missiles Committee
Pdn	Production
Plng	Planning
psi	pounds per square inch
R&D	Research and Development
SOD	Secretary of Defense
WPD	War Plans Division
WSEG	Weapon Systems Evaluation Group

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