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A HISTORY OF THE AIR FORCE ATOMIC ENERGY PROGRAM

1943-1953

In Five Volumes

Volume III

PART 1
SECTION 1

BUILDING AN ATOMIC AIR FORCE

1949-1953

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CHAPTER I

STAFF CONTROL, ORGANIZATION, AND POLICY

Situation in Early 1949

During the three and one half years following the end of World War II the Air Force had developed a relatively firm atomic organization within the Headquarters staff and could also show important progress in various areas of atomic weapons activity. Nevertheless, it could be said that the possibilities inherent in atomic warfare had been scarcely touched. Despite the increased number of Air Force personnel having some familiarity with atomic weapons; despite the growing prestige and influence of the special atomic project offices in Headquarters, at Kirtland, and in the Air Materiel Command; and despite the growing atomic striking power of the Strategic Air Command, problems connected with the new weapon were still handled gingerly if not with absolute reluctance in most parts of the Air Force. Special measures were all too frequently necessary to get action on matters which might have been routine in another program. To some officers within AFOAT, described by one of them as "primarily a political campaign manager's office," the process of indoctrinating the Air Force seemed to stretch ahead interminably.[1]

As has been seen in Volume II, many high officers believed that extraordinary measures would be necessary to properly integrate atomic warfare into the Air Force, with suggested methods of approach ranging from statements of policy to sweeping changes in organization. Some insisted that mere indoctrination in atomic matters was entirely inadequate—that atomic warfare was only an aspect of a

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still larger problem of achieving a harmonious balancing of strategy, current capability, and the phased development of new weapons systems through an organized application of the most advanced scientific technology. As has been seen, a complete restudy of the problem of revitalizing research and development within the Air Force had already begun at the direction of the Vice Chief of Staff, Gen. Muir S. Fairchild.* During February and March 1949 at least two other proposals of similar wide scope, both abortive, originated within the Air Force atomic organization. Col. W. L. Kennedy of AFOAT proposed setting up a Strategic Advisory Committee, consisting of outstanding colonels and reporting to the Chief of Staff, to direct "a proper marriage of strategy, aircraft design, weapon design, and allied equipment design."[2] Shortly afterward Brig. Gen. Roscoe C. Wilson, Air Force member of the MLC, proposed to Lt. Gen. Lauris Norstad, DCS/Operations, that a Long Range Objectives Panel be established "to do for the USAF what a similar panel headed by Dr. J. R. Oppenheimer had done for the AEC."[3] Colonel Kennedy's proposal was killed within AFOAT and General Wilson's by Plans Division with the concurrence of AFOAT on similar grounds—that such a project should be a function of the entire Air Staff rather than of an isolated committee. Contending that such committees or groups were justifiable only in the case of projects or programs so unique as not be readily handled in the existing staff structure (the justification for AFOAT itself), an AFOAT officer, Col. A. A. Fickel, went on to remark:[4]

> The staff function of giving direction to the development of the Air Force, on the dual basis of strategic guidance and technical guidance, is a primary function which must not, repeat must not, be delegated to a committee or group which is outside the or-

*See Volume II, Chapter 4E.

[redacted]

ganic structure of the Air Staff. The type of guidance which is required is a basic job of the Air Staff itself. This job is fully as important as that of administering the Air Force. Strategic guidance cannot be accomplished by an ivory tower organization or group which does not have the backing and support of a fully responsible staff organization.

Meanwhile, a renewed effort had begun within AFOAT to write and secure the approval of the Chief of Staff to an over-all statement of policy on the atomic program. As seen in Volume II, this had been attempted repeatedly without success during the three previous years. The proposed policy statement, besides assigning highest priority to atomic matters, would direct addressees to make a searching review of all projects, programs, and policies within their purview with the objective of accelerating action. By mid-March this statement had been circulated among a number of segments of the Air Staff at General Schlatter's direction and received favorable comment.[5]

Between March and June the policy statement, although accepted in principle by the Air Staff, continued to go through successive redrafts, with Gen. Norstad, Lt. Gen. Frank F. Everest, and Maj. Gen. David M. Schlatter participating in the effort to arrive at an acceptable version. The DCS/Materiel, Lt. Gen. Kenneth B. Wolfe, opposed the statement on the ground that it contained no exception for Operation VITTLES, then the subject of an all-out Air Force-wide effort, and apparently partly for the same reason Gen. Muir S. Fairchild, Vice Chief of Staff, rejected the "first priority" statement completely, which he thought would do no good and might cause confusion. As a result, in the fifth draft the statement was changed to read simply, "Atomic warfare shall be emphasized at all echelons," which AFOAT officers considered a serious weakening. As finally issued on 9 June 1949, the statement consisted of the following three paragraphs directed as a letter to all major commands and as a mem-

orandum to the deputy chiefs of staff: [redacted]

1. The great responsibilities charged to the Air Force in joint plans providing for the security of the United States impose a serious obligation upon us to insure at all times our capability of successfully discharging these responsibilities. The purpose, timing, and the nature of the strategic air offensive makes our ability and readiness to accomplish it of paramount importance. The core, the real impact, of the strategic air offensive is our ability to deliver effectively the atomic bomb.

2. It is the policy of the Air Force, therefore, that the training, logistic and operational requirements to conduct effective atomic warfare shall be emphasized at all echelons.

3. It is directed that you make a searching review of all programs, projects, and policies under your jurisdiction to insure that the entire Air Force vigorously supports this policy.

Reorganizing the Air Force Atomic Program, 1949-1950

As the first over-all statement of policy on atomic matters by the Chief of Staff, the letter represented an achievement for which AFOAT and its predecessor, the Special Weapons Group, had been striving for over two years. Nevertheless, it failed to give the atomic program the desired first priority, nor was it immediately followed by any specific or detailed plan of implementation, which had been long considered to be an essential accompaniment of such a statement. Some officers therefore looked on it as a first step only, and hardly more than a statement of good intentions. As a matter of fact, in addition to the policy statement, General Schlatter's staff in AFOAT had already presented on 11 May an extensive report on the atomic program to the Chief of Staff which included numerous far-reaching specific proposals, but this was not immediately acted on. Simultaneously, the Inspector General, Maj. Gen. Hugh S. Knerr, was for the first time being drawn into the atomic program. The initial result of this was to be a report during the summer which was to

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have an explosive effect. Even more catalytic, however, was the detection in early September( )of the successful detonation by Russia of an atomic bomb two years ahead of the officially estimated "earliest possible date."*

Besides these planning activities AFOAT had begun efforts early in 1949 to transfer some of its functions to other sections of the Air Staff, regarding this as a necessary preliminary to ultimate disbanding of the office. In February it urged the Director of Research and Development to assume active planning, policy, and programming responsibility for all USAF atomic activity in his area. AFOAT suggested several specific measures as immediately appropriate, including formulation and defense of the FY 1951 atomic research and development budget, bringing pressure on the AMC to intensify its atomic activities, establishment of an improved priority system for atomic projects, and establishment of a useful reports system for atomic projects.[7] In response, the Director of Research and Development proposed the establishment of an officer and a limited staff to maintain contact with the entire atomic program. AFOAT agreed to this as a transitional measure while pointing out the danger in so isolating the atomic function within an office.[8]

The above action, taken in June, had been preceded in April by an agreement between Generals Schlatter and Knerr that in view of the rapid development of an Air Force-wide program the Inspector General would establish within his immediate office an individual of "broad familiarity with the national atomic energy program" to advise him and assure him that his subordinate offices were properly informed. It was also agreed that individuals would be properly

*See below, Chapter 7G.

cleared and indoctrinated within each subordinate office. In fulfillment of this agreement David S. Teeple, a civilian, was appointed as Knerr's personal advisor, while Col. Ralph Rhudy was assigned to the Office of the Air Inspector.[9]

Despite these moves, the position and mission of AFOAT within the Air Staff remained virtually unchanged as far as remaining the principal nerve center. The dilemma in which the office found itself was succinctly stated by Col. G. Y. Jumper:[10]

> As we all know, atomic energy will never be handled well until each conventional office assumes its functional share of the atomic energy program. We in AFOAT have always recognized ourselves as a temporary necessary evil, and have dedicated our efforts to working ourselves out of business. Analogously, the mere fact of our existence makes it difficult to work ourselves out of business, because our being here provides a receptacle for cats and dogs which other people would rather not kill.

Nevertheless, as the fountainhead of Air Force atomic policy, it was essential that the office maintain a clearly defined course of action, something which every day became more difficult as the program grew in complexity. In April 1949 Col. A. A. Fickel of AFOAT recognized what he considered to be a turning point in which both the Air Force and its atomic office must shift their attention as far as possible "from political issues of position to developmental issues of our real capability." Reporting on a discussion with General Schlatter, Assistant for Atomic Energy, he stated that AFOAT in the past had concentrated on two subjects: (1) establishing the position of the Air Force relative to atomic energy, which he considered essentially a matter of indoctrinating the Air Force into assuming its rightful duties and responsibilities; (2) the development of early combat readiness, "a fairly straightforward operational readiness problem." Since an interim type of capability, subject to limitations of the

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current weapons and carriers, had been attained, the problem now became one of attaining an ultimate much improved capability based on newer weapons and delivery systems.[11] It was Colonel Fickel's opinion, and apparently that of AFOAT was well, that the key to success in this effort lay in materiel. He contended that in this effort operational problems would remain relatively straightforward, but that many unusual materiel problems would appear—that in fact all major unique problems in atomc warfare hinged on materiel. Contending that this applied equally to relations with the Atomic Energy Commission and the AFSWP as well as to the situation in the Air Force, he further stated:

> The development of operational plans and strategic concepts can be made by the normal military Air Force officer with combat experience sitting at a desk. But the development of superior means by which new plans and better plans can be implemented, requires expenditure of money, organization of programs, and allocation of personnel in materiel fields—both logistics and in R&D. These are the areas in which the unique aspects of atomic energy will make themselves felt in developing a superior Air Force. This is the area where AFOAT must put its primary effort. So long as AFOAT continues in existence as the sole agency in the Air Staff with overall staff monitorship, it must take this subject actively in hand, and not expect it to be picked up out of the vacuum by DCS/M or by AMC.

He accordingly proposed that AFOAT emphasize materiel by bringing top level personnel, experienced in materiel policy matters, into the atomic energy program, and more specifically that the Materiel Division of AFOAT be built up so that it could be transferred into DCS/Materiel in about one year.

The above proposal was followed out by the bringing of experienced officers with logistic backgrounds like Cols. J.S. Mills, R. H. Lee, C.H. Donnelly, and A.A. Denton into AFOAT during 1949, and ultimately by the progressive transfer of nearly all the office's materiel functions into DCS/Materiel during 1951 and 1952. During the latter

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two years the Air Materiel Command was also directed to take over the functions of atomic weapons storage (non-nuclear) and equipment supply, and this policy of emphasizing the materiel aspects of atomic energy conditioned many of the decisions and positions assumed by AFOAT during the period.

Meanwhile, during the summer of 1949 events of far reaching importance to the Air Force atomic program developed rapidly. As previously noted, a broad study reviewing the needs of the Air Force atomic program had reached the Chief of Staff from General Schlatter on 11 May 1949 after several months of intensive effort by his staff.[12] Since this was to become the basis of the first coordinated Air Force atomic program, which was to be implemented late in the year, it deserves analysis. Pointing out that he was taking a point of view national in scope (and therefore expressing views of highly sensitive import), General Schlatter suggested to the Chief of Staff that copies be supplied only to the top members of the Air Staff, the Commanding General, SAC, and the Commanding General, AMC. Specific recommendations by AFOAT would be based on these comments.

The study asserted the following broad thesis:

> Because of their capabilities, limitations, and availabilities, atomic weapons at this time are primarily suitable for strategic air warfare. It follows, therefore, that the major responsibility for development of atomic weapons and for planning and preparing for atomic warfare rests inherently with the U. S. Air Force.

It also contended that the preparation for atomic warfare must be integrated and not segmented:

> Atomic weapons and the airplanes which carry them should be an indivisible whole and what affects the characteristics of one has a corresponding effect on the other as much during development and manufacturing phases as in training and operational phases. All those factors which are used by the Air Force to determine force requirements and equipment characteristics, and which start with the

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national objectives, strategy, target analysis and selection, and proceed through operational factors to the design of an aircraft, have corresponding effects on the design, development, and stockpiling of atomic weapons, the production of fissile material and the exploitation of raw material sources.

The study went on to indicate two main lines of action, internal and external, by which the Air Force would attain the desired capability, these to be followed later by specific recommendations. Internally, the following objectives were delineated:

a. Educate the Air Force staff and commands in all the aspects of atomic warfare, to closely integrate the primary weapon in our strategy, tactics and techniques, and especially logistics.

b. Expand strategic vulnerability studies to provide a broad foundation for determination of requirements for atomic weapons by numbers and types for the medium and long range future.

c. Develop a medium range (three to five years) plan to furnish guidance for programs, budgets, and expenditures. Develop a long range (five to ten years) plan to guide current research and development programs and to serve as a basis for Air Force requirements.

d. Correlate atomic warfare in perspective with conventional missions of the Air Force.

e. Evaluate Air Force requirements for personnel, airplanes, and equipment as affected by atomic warfare.

f. Improve the Air Force logistic capability for atomic warfare.

Externally, the study proposed the following steps to assure the Air Force its proper position in the national atomic energy program:

a. Designate the Chief of Staff, U. S. Air Force, the executive Agent of the Joint Chiefs of Staff in full command control of the Armed Forces Special Weapons Project. The present system of three separate commanders is unsound.

b. Gradually dissolve the Armed Forces Special Weapons Project into the normal structure of the National Military Establishment.

c. Acquire U. S. Air Force custody of atomic bombs.

d. Acquire consumer-manufacturer type relationship with the Atomic Energy Commission for manufacture and development of non-nuclear components, to more closely integrate the primary weapon

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of the Air Force with the balance of its program.

e. Acquire complete control of atomic bomb manufacture and development for the U. S. Air Force, the Navy to continue on the type bomb (less nuclear components).

f. Assign primary responsibility for development and manufacture of other atomic weapons as indicated by primary interest, under current policies and procedures.

Shortly thereafter General Knerr, the Inspector General, transmitted to the Chief of Staff a sweeping report on the Air Force atomic program which castigated its weakness and called for remedial action. Although this report has not been made available for historical evaluation, it is clear that its constructive portions closely followed the recommendations of the AFOAT report of May 11. In fact, most of the factual information and conclusions were obtained directly from the AFOAT staff, which was casting about for means to arouse the top levels of the Air Staff to what it considered the weakness of the atomic program. Other information and conclusions of a critical type in the report were assembled by Maj. Gen. St. Clair Street during a personal tour of inspection of Air Force field activities in the atomic area which led him to believe that these functions, especially at Kirtland, were quite inadequate.* The report aroused a more than ordinary reaction in high staff circles both because of its sharp tone and because a copy in some manner reached the hands of the Joint Congressional Committee on Atomic Energy, causing some embarrassment to the Air Force. The report was transmitted to AFOAT for comment on 3 August 1949, and after confer-

*The final version of the Knerr report is generally considered to have been the work of David S. Teeple, civilian assistant to General Knerr. Teeple had previously served in Manhattan District and on the staff of the Joint Congressional Committee on Atomic Energy.

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ences with Lt. Gens. Curtis E. LeMay and Benjamin W. Chidlaw, commanders of the SAC and AMC, General Schlatter replied on 30 August pointing out that the Inspector General's report agreed substantially with his own except as to two points (probably relating to relations with the AEC) which he felt unwise to raise at that time. Otherwise, he found the recommendations "sound and timely," and promised to prepare a detailed program for their implementation together with additional items. Despite the feelings ruffled by the report, the general effect appears to have been to reenforce the arguments already advanced by AFOAT in May and to clear the way for the more detailed recommendations on implementation which were being prepared.[13]

On 12 October 1949, the AFOAT study in its final form was returned to the Chief of Staff, who immediately approved it as the overall plan for improving the capability of the Air Force to conduct atomic warfare.* This important study, which included the first broad program of action in the atomic area approved by the Chief of Staff, was accompanied by a letter from General Schlatter which concluded that despite some progress by the Air Force in attaining atomic capability drastic and immediate action was required by the Department of Defense, by the Air Force, and within the Air Force.[14] The letter requested the dispatch of policy statements to the JCS and to the Air Force commands and deputy chiefs of staff, as well as lists of implementing actions. In its discussion section the report stated:

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*Meanwhile, General Knerr had submitted a second report in September in addition to his previous. This likewise has not been made available for evaluation, but the general lines doubtless agreed with those of the AFOAT report of 12 October. (See Daily Diary, Materiel Division, AFOAT, 15-16 September 1949.)

> It is apparent that the USAF has not attained sufficient participation in the design, development, and logistics of atomic weapons to exploit fully the Air Force responsibility and inherent capabilities for strategic air warfare. In order to attain this participation, the Air Force must generate and stimulate action within its own Department and within the Department of Defense.

It found a major stumbling block to the attainment of an effective national atomic program in the cumbersome organizational structure within the Department of Defense, in particular the Armed Forces Special Weapons Project, which it described as "an administrative attenuation of direct collaboration channels" between the AEC and DOD. It pointed out as the best possible solution the designation of the Chief of Staff, USAF, as the executive agent for the AFSWP pending the gradual dissolution of that agency's responsibilities among the proper sections of the Department of Defense, but conceded that the time was not propitious for raising again the above proposal, which had already been twice rejected at high levels within the Defense Department.

Pointing out the current situation as to custody of nuclear and non-nuclear components of atomic bombs, the study described this as another cumbersome and inefficient arrangement which should be kept in mind for action at a later appropriate time. As another long-range goal the study proposed that the Air Force seek to attain "a more direct and effective producer—consumer relationship with AEC, similar to that existing between the Air Force and the aircraft industry." It contended:

> The airplane, crew, and the weapon, are an entity and must be developed and operated as a weapons system if the Air Force is to accomplish its atomic mission. The know-how of the Air Force should fully be exploited in the design and development of atomic weapons as it is in the means of delivery.

As an interim step toward direct participation by the Air Force in

atomic weapons research and development the study proposed that a Special Weapons Center be established at Kirtland Air Force Base. A fairly detailed exposition was given of the responsibilities and functions of the proposed Center, which would be under the direct control of Headquarters, USAF.

While conceding that the time was not ripe for pressing for a resolution of the situations involving the control of the AFSWP, custody of atomic weapons, and Air Force relations with the AEC, the study advised that the Air Force have ready for use at the propitious time plans for action in all these matters. Meantime, it proposed that the deputy chiefs of staff and the Inspector General be directed to take action immediately on 17 specific matters in addition to the above-mentioned matter of the establishment of an Air Force Special Weapons Center.

In implementation of the proposals in the study the Vice Chief of Staff sent action memorandums to the deputy chiefs on 27 October 1949 referring to the Chief of Staff's policy letter of 9 June, pointing out that the recent atomic explosion in Russia emphasized the necessity of accelerating action, and directing specific actions in each of their responsible areas.* The most detailed by far went to the Deputy Chief of Staff Operations, who was directed to[15]

1. Maintain continuous evaluation of Air Force requirements for airplanes and equipment for the atomic offensive on the basis of current and projected atomic weapons production.

2. Accelerate the development of a medium range (three to five years) war plan to furnish guidance for Air Force programs, budgets, and expenditures.

*Messages were sent by the Chief of Staff on the same date to the major commands, containing the same general statements but not directing specific actions.

[redacted]

3. Accelerate the development of a long range (five to ten years) war plan to guide research and development programs and to serve as a basis for the establishment of Air Force requirements. Adequate consideration must be given not only to new types of aircraft and missiles but also to new types of atomic weapons and warheads.

4. Conduct large scale (Air Force wide) annual maneuvers, primarily directed toward testing the feasibility of current emergency war plans and press for joint maneuvers to further test feasibility of joint war plans.

5. Expand target studies to provide a sound foundation for determination of requirements for atomic weapons by numbers and types. Specifically, target studies are required:

   a. To determine the priority and the extent to which atomic bombs can be allocated to strategic, counter air force, and tactical targets which will contribute most in achieving the war aims of the United States.

   b. To determine accuracy and efficiency criteria which short, medium, and long range atomic warhead missiles must meet before they can supplement or replace conventional atomic carriers.

6. Continue to emphasize the necessity to Joint Planners that the Army and Navy Departments should develop emergency war plans designed to exploit the advantages gained by the atomic offensive carried out under the Air Force emergency war plans.

7. Establish a USAF Special Weapons Center at Kirtland Air Force Base under direct command of Headquarters, USAF. For synopsis covering establishment of the Center, see enclosure entitled, "Establishment of a USAF Special Weapons Center at Kirtland Air Force Base under Direct Command of Headquarters, USAF."

8. Prepare a memorandum for the Chief of Staff to the Joint Chiefs of Staff recommending that in view of the present known Russian capability a thorough examination be made of the major atomic energy relationships, organization, plans, and policies which had significance in the Department of Defense. Such review should include interdepartmental organization and relationships with reference to the National Atomic Energy Program. The object of such examination should be to determine if, from the viewpoint of the Department of Defense, all aspects are now adequate to the existing situation.

The directives to the Deputy Chiefs of Staff Materiel, Personnel, and Comptroller were much less detailed than those to the Deputy Chief of Staff Operations. The DCS/Materiel was directed to establish within the existing facilities of the Air Materiel Command an

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atomic weapons research and development organization concerned with non-nuclear components to assure parallel development of the bomb and delivery vehicles; to keep current a base development plan for atomic striking forces suitable for implementing medium and long range plans; to prepare a staff study reviewing all phases of the supply system concerning the atomic bomb and all its ancillary equipment to ascertain whether present supply procedures were adequate.[16] The last directive, as will be seen, was to have far-reaching consequences. The DCS/Personnel was directed to take immediate action to expand postgraduate training of nuclear physics and electronics officers; insure continuance of the policy of furnishing atomic programs with the highest caliber personnel; expand courses on military applications of atomic energy at the Air University to emphasize the logistical and research and development aspects; reestimate the number of electronics and nuclear engineers needed for atomic warfare-guided missile and the NEPA programs and the dates when the beginning of training would be necessary.[17]

The Chief of Staff also directed the DCS/Comptroller to "categorize" the functions of the Air Force directly contributory to improving the Air Force capability for atomic warfare and give top priority to these in budgetary planning.[18] The directive became the basis for the first organized budgetary effort to distinguish the atomic projects of the Air Force from others. This was to prove a most difficult task, since "a meaningful budgetary breaking out of atomic projects is dependent upon the making of a functional budget," which was not the procedure currently followed. Nevertheless, it was agreed that the Assistant for Programming, DCS/Operations, would attempt to distinguish these projects and protect their priority, while the DCS/Comptroller

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would report on progress made and also use the information assembled in budgetary planning.[19] The Inspector General was directed to accelerate the program of obtaining Restricted Data clearances for Air Force personnel and to give the highest priority to the inspection of all Air Force atomic activities.[20]

The above comprehensive program of action was to be monitored by the Assistant for Atomic Energy, and this became a major activity of AFOAT during 1950. Vigorous action followed in many areas. One of the first actions taken was the preparation of a memorandum, signed by the Chief of Staff on 25 October 1949, proposing to the Joint Chiefs of Staff that the Joint Strategic Survey Committee conduct a review of military participation in the atomic energy program in the light of the Soviet development of an atomic bomb three years sooner than expected. This action originated in the Directorate of Plans and Operations, DCS/Operations, even before the receipt of the directive from the Chief of Staff.[21] Meanwhile, the AFSWP on its own responsibility had gone ahead on a paper, "Recommended Actions in Matters of Atomic Weapons", which also reflected the Russian atomic explosion. This resulted in a recommendation by the Chief of Staff, USA, that the Air Force Chief reconvene the ad hoc committee on the stockpile problem which had drawn up the JCS stockpile requirement.[22]

Action was immediately taken by the DCS/Operations to organize the Special Weapons Command, which it had now been decided to establish in lieu of the Center first proposed. The Command, which was officially activated on 1 December 1949, assumed the functions and responsibilities of the Field Office for Atomic Energy and the other organizations at Kirtland Air Force Base (particularly the

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Special Weapons Development Group of the Air Materiel Command). Commanded by Brig. Gen. Howard G. Bunker, its basic mission was described as follows:[23]

> The mission of the Special Weapons Command is to establish and maintain technical supervision over a test facility and group of qualified personnel, aircraft, equipment, and instrumentation that will provide for the Air Force, the Atomic Energy Commission, their contractors, and other agencies of the Department of Defense, an organization for the development testing of atomic weapons or other special weapons with their associated equipment, and for determining the adequacy of airborne vehicles to carry these special weapons. The Special Weapons Command will be the primary source of scientific and technical information pertaining to special weapons development and associated special techniques for the Air Force.

The Assistant for Atomic Energy was to provide operational and technical guidance, and the Strategic Air Command and the Air Materiel Command were directed to maintain liaison offices at the headquarters of the new command.*

On 8 December 1949 General Wolfe, DCS/Materiel, directed the AMC to carry out an extensive research and development program in the atomic weapons field which he outlined in a program guidance plan. Denying that the Atomic Energy Act prevented the Air Force from undertaking such programs, he pointed out that the Navy's [redacted] had established a precedent for such direct participation in atomic weapons development. He described atomic weapons research and development pro-

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*The Deputy Chief of Staff, Operations, took further action by organizing a Special Weapons Team in the Directorate of Plans. On 1 Dec 1949 Col. R. E. Applegate was transferred from the Rainbow Team to join Col. E. P. Mechling and other officers in the new staff section. Several officers came from the deactivated Guided Missile Group, whose planning function continued under the Special Weapons Team. During early 1950 the Team worked mainly on development policies and new uses for atomic weapons and guided missiles. Some of the specific topics were the use of atomic warheads with guided missiles, the tactical use of atomic bombs, the selection of atomic target systems, the use of nuclear energy for aircraft propulsion, quantitative atomic weapons requirements, the use of guided missiles in intermediate war plans, atomic weapons storage policy, and the use of air-to-air and surface-to-air missiles in air defense. (History of D/Plans, July 1949 to June 1950, p. 13.)

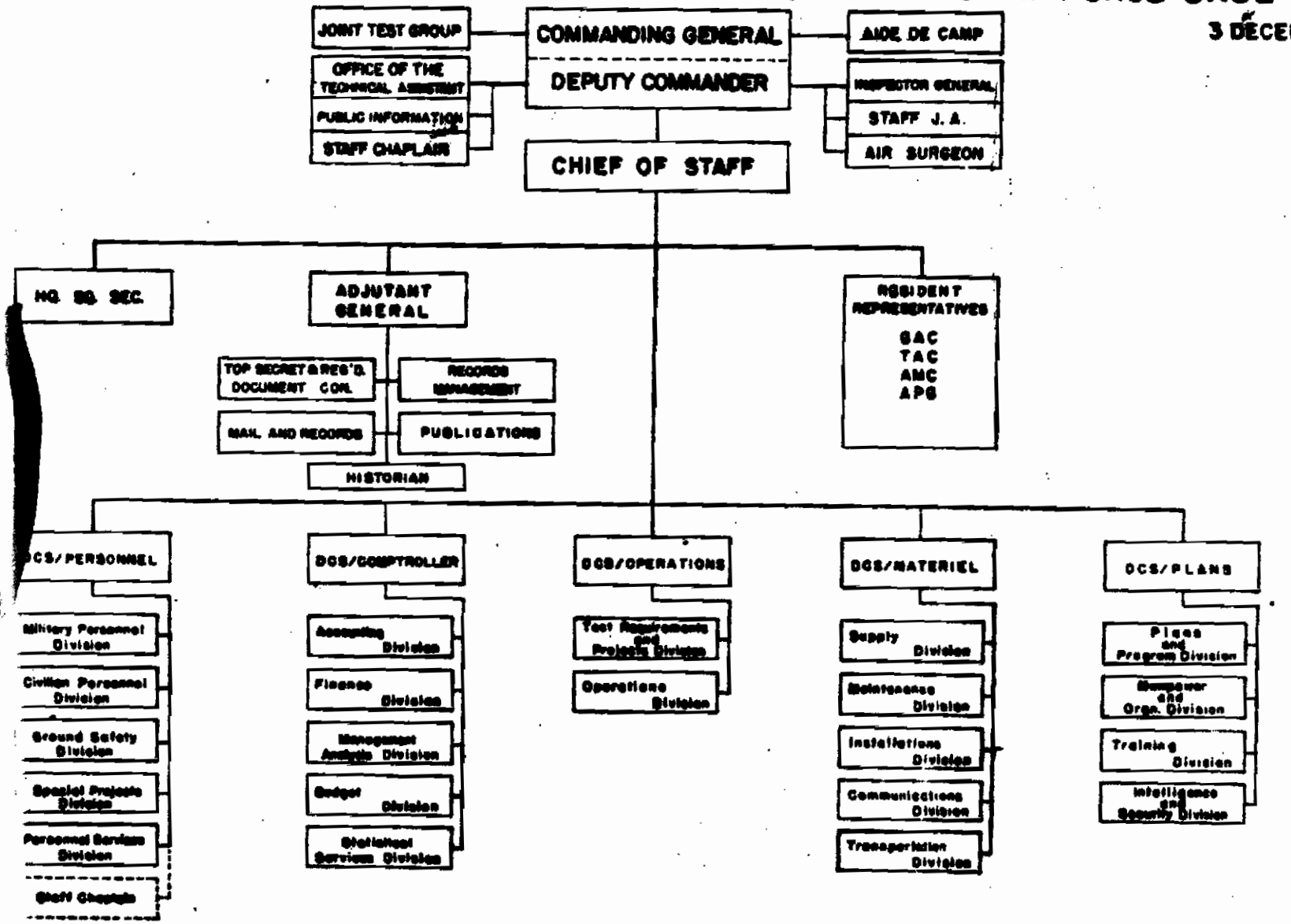
grams by the Air Force as falling in four principal categories: (1) basic weapons characteristics, including fuzing and firing, ballistics, nuclear phenomena, power applications, and new weapons systems; (2) storage depot to target, including supply and maintenance aircraft, atomic bombs, and associated equipment; (3) weapons effects; (4) defensive aspects. He also went on to designate three groups of objectives in atomic research and development for the Air Force--immediate, intermediate, and long range--covering the next 20 years.[24]

Meanwhile, another movement was under way in Headquarters, USAF, which was ultimately to have far reaching effects on the atomic program. This was a series of studies, which had begun in 1945, concerned with the position of research and development within the Air Force and the possible need for a sweeping reorganization. The earlier phase of this movement has been previously covered in Volume II.* It culminated in two analyses by special committees during 1949--the Ridenour and Anderson Committees--one civilian and the other military. Both reported in the fall of 1949, with almost complete agreement, that drastic measures would be necessary to establish research and development in its properly functioning position within the Air Force. In order to carry out the recommended program, the studies proposed that a specialized staff section of the deputy level be established within Headquarters, USAF, and that all research and development activities within the Air Force, organized into development centers, be concentrated under a new major command.[25] Despite serious objections, the recommendations were approved by the Chief of Staff on 3 January 1950 with the concurrence of the Secretary of the Air Force, and both the Deputy Chief of Air Staff for Development and the

*See Chapters 4E and 15A.

ORGANIZATION, SPECIAL WEAPONS COMMAND, KIRTLAND AIR FORCE BASE

3 DECEMBER 1951



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Research and Development Command were established on 23 January 1950. General Schlatter was appointed Commanding General of the new command and was replaced in his former position as Assistant DCS/Operations for Atomic Energy by Maj. Gen. R. C. Wilson, formerly Deputy Commander for Air of the AFSWP. Separation of the research and development activities from the other major commands, particularly the AMC, was to proceed, however, on an evolutionary basis, and until April 1951 the new command functioned on a skeleton basis as little more than a planning group.[26] This reorganization of the research and development function was of course ultimately to drastically affect the atomic program, with the Special Weapons Command passing under control of the Research and Development Command in April 1952 as one of its development centers.* More important, research and development in atomic warfare was soon to become an active phase of the work of most of the development centers.

Development of New Logistic Policy, 1950-51

One of the most important actions to grow out of the AFOAT study of October 1949 was taken by General Wolfe, DCS/Materiel, who inaugurated a policy of reducing the activity of the AFSWP in the logistic field through the standardization of atomic supply and maintenance procedures and their integration into the Air Force logistic system. In a letter to the Vice Chief of Staff on 1 February 1950 Wolfe pointed out that atomic weapons, ancillary equipment, and supplies were controlled by a variety of authorities. For example, nuclear components,

*The letter by the Vice Chief of Staff directing the transfer emphasized the need for greater activity by the Air Force in atomic research and development. (Ltr, VCS to USAF to CG ARDC, sub: Transfer to SWC to ARDC, 18 Jan 1952.)

[redacted]

complementary parts, and Restricted Data Type A items were controlled by the AEC and AFSWP, and the remaining supplies and equipment by the Air Force.[27] This had resulted in various difficulties, as well as a failure of the Air Force atomic logistic system to develop properly. He concluded that the Air Force responsibility for the operational success of the atomic offensive required that all needed material be completely integrated into the Air Force supply system, that an equipment guide should be prepared, and that the Air Materiel Command should be directed to concern itself with atomic weapons and ancillary equipment wherever issue to an Air Force organization was required. The above policy and actions were approved with the additional recommendation that such items be incorporated in Technical Orders and all Air Force supply publications, "considering the AFSWP in the same light as any commercial supplier."[28] As a result of this decision a separate Air Force class of atomic energy property (Class 09D) was established, specialized maintenance depots were set up at

and integration of atomic energy data into the Air Force system of technical orders began.

A year later a further significant step has taken in the materiel field when the Air Force by agreement with the Defense Department and the AEC entered upon the operation of certain of the atomic bomb storage sites. It also assumed full responsibility for the storage of atomic weapons at overseas operational bases. Announcing the development on 21 February 1951, Gen. Nathan F. Twining, Vice Chief of Staff, notified the commanding generals of the SAC, TAC, and AMC that the Air Force would operate new sites at

[9] These would become available between December 1951 and January 1953. In addition, he stated that

sites would probably also be established at other Air Force Bases

This

directive, known as "the Twining letter," laid down the following course of action:

1. A weapons control and allocation center was to be established in Headquarters, USAF, to maintain a current listing of all weapons assigned to the Air Force.
2. The AMC was delegated the Air Force responsibility for storage and maintenance of weapons in th
3. The AMC was delegated the Air Force responsibility for close technical supervision and coordination of site activities
4. The AMC was delegated the responsibility for accountability and for the development of supply and maintenance procedures for weapons and accessory equipment in AF custody or under Air Force operational control.
5. The AMC was directed to establish a specialized organization to accomplish the above functions. It was also directed to submit a proposed organization for the control of storage sites and for technical supervision of site activities

Further action followed later in the year. As a result of the increasing capability of the Air Force in the materiel area, General Wilson had recommended on 23 April 1951 the establishment of an office within DCS/Materiel with authority and responsibility for monitoring the atomic activities of all materiel agencies. With the concurrence of General Wolfe, DCS/Materiel, General Twining directed on

14 September 1951 that such action be taken. As a result the office of Deputy for Atomic Energy was established under the Assistant for Program Control, DCS/Materiel.[30] The Deputy was charged with the responsibility for all materiel functions—such as materiel policy, supply, and procurement; logistic planning, transportation, and maintenance—in support of the USAF atomic energy program.* Colonel A. A. Denton was transferred from AFOAT late in 1951 to become the first holder of this important position.

The letter establishing the office was followed a few days later by a directive from General Twining to the Chief, AFSWP, directing him to support the AMC in all matters concerned with atomic bombs and associated test and handling equipment furnished by the AEC. After being subjected by the Air Force to operational suitability tests, this materiel would be incorporated in the Air Force logistic system, and was to be stated in Air Force budget requirements. Quantitative requirements would be formulated by the Air Force and stated to the AFSWP; other than for this AEC-furnished equipment the Air Force would have no requirement for AFSWP-furnished materiel. The initial supply and resupply of Air Force organizations and the distribution and expenditure of AEC-furnished materiel within the Air Force was to be controlled by the AMC subject to the policies of Headquarters, USAF. This important action brought all atomic materiel except the bombs themselves within the Air Force logistic and budgetary system, and also excluded the AFSWP from the Air Force supply system other than as a channel for the materiel obtained from the AEC.[31]

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*See also below, Chapter 9.

[redacted]

As a result of the rapid advances in logistic atomic capability during 1951, Col. C. F. Peterson, Chief of the Materiel Branch, AFOAT, recommended that the Materiel Branch be abolished and that AFOAT, except for policy guidance, get completely out of materiel. He contended that so much progress had been made in integrating the logistical aspect of the atomic program into the regular channels of Headquarters and the major commands that the AMC, DCS/M, DCS/D, and other USAF agencies were comin. to AFOAT only for policy guidance. Pointing out specific advances, he emphasized the following as the most significant: (1) development of an atomic energy logistic plan which had resulted in the establishment of a separate class of atomic energy property, of specialized depots at . Air Force Bases, of specialized logistic units, of a Special Weapons Office at AMC, and of an atomic energy office within DCS/Materiel; (2) integration of atomic energy data into the Air Force system of technical orders; (3) on the job training of personnel to fill positions within the Headquarters staff sections; (4) the decision that the USAF would assume operational control of Site[redacted]12 Approval of this proposal by General Bunker, who had succeeded General Wilson as Assistant for Atomic Energy in October 1951, led to the final transfer of the remainder of the atomic energy materiel control function to DCS/Materiel in 1952.*

Another important development within the field of atomic materiel policy related to the inspection of Air Force special weapons logistic

*At this time Colonel Peterson replaced Colonel Denton as Deputy for Atomic Energy, Materiel Program Control. Remaining personnel of the AFOAT Materiel Branch were combined with those of the Development Branch to form a new Special Projects Branch.

[redacted]

organizations. On 14 March 1952 the Deputy for Materiel Atomic Energy Control, Colonel Denton, requested the Inspector General to prepare a plan for "the complete assumption by the Air Force of responsibility for the inspection of all Air Force Atomic Weapons Organizations and facilities, coordinated with a phasing out of requirements for any AFSWP inspections within the Air Force, except for technical inspections to insure standardization in the procedures for maintenance and assembly of atomic weapons at storage sites."[33] The result was to bring the Inspector General into the atomic materiel picture for the first time at the operational level.*

Preparation of the Policy-Atomic Energy

Despite the advances which were taking place in Air Force atomic logistics, some high officers believed that this activity plus the increasing atomic striking power of the SAC and TAC constituted an insufficient exploitation of the possibilities inherent in the military use of atomic energy. This feeling was intensified by the issuance of the new AFSWP directive of 12 July 1951, reissued as AFL 20-27 of 25 September 1951, which appeared to confirm the AFSWP in many of its functions. In contrast, there was no detailed policy guidance available on Air Force aims and functions as to the expanding atomic program.** In January 1952, Maj. Gen. Donald L. Putt, acting DCS/ Development, writing to Lt. Gen. Thomas D. White, DCS/Operations, requested that he prepare a document describing "the concept of atomic capability from within the framework of the roles and missions of the Air Force indicating objectives and the time element."[34] Complaining of

*Action was forced by the issuance by the AFSWP of Special Weapons Bulletin No. 30-1, 25 March 1952, which appeared in conflict with the above concept. Colonel Denton requested the Inspector General to have the Bulletin withdrawn or modified.

**See below, this chapter.

the lack of specific definition of the term "atomic capability," he went on to state:

> It is essential that the Air Force gain within its own structure and organization, complete and outstanding competency within the field of atomic energy in order that the USAF may hold a position of preeminence during the ensuing years.

He described the necessary competency as including the following elements: (1) "knowledge and understanding of the scientific facts as well as their military applications," (2) "organizational structure to assure proper consideration of atomic matters in the same light as other problems," (3) "development and contractual contacts of such ability as to assure the very best military applications to our needs," (4) "adequate logistical support," (5) "operational concepts of weapon employment to maximize the use of such weapons," (6) "maintenance of the highest standards in logical, sound, and far-reaching planning of a complete program for such applications." He urged that these objectives be geared to a program to gain stated aims within ten years and based on a sound concept.

Essentially a statement of the need for a restatement of the Air Force's objectives in the field of atomic energy, the Putt memorandum initiated a broad restudy of the atomic program. It was quickly supported by Lt. Gen. Orval R. Cook, DCS/Materiel, who agreed as to the desirability of preparing "a document setting forth the Air Force goal and the ways and means of attaining that goal."[35] He stated further:

> I concur with General Putt in his feeling that the Air Force must gain outstanding competence in the field of atomic energy, and that, in order to attain this competence, it is essential that Air Force policies, plans, and aims be stated formally and supported actively throughout the Air Force.

Cook indicated two important aspects of atomic energy to which the Air Force should give particular attention: (1) the wide scope of appli-

[redacted]

cation which might alter radically the mission and structure within a generation; (2) the necessity of constant competition with other military services, the Atomic Energy Commission, and industry for the use of atomic energy which dictated organizational and tactical flexibility along with aggressiveness in pursuit of goals. He proposed an immediate attack on certain problems in the logistical planning area relating to the Air Force's assumption of certain logistical functions of the AFSWP and AEC.

With this impetus the problem was referred to AFOAT by DCS/Operations and was under consideration during February and March. Early in the latter month Colonel Peterson, Chief of the Materiel Branch, AFOAT, completed a rather extensive report in which he reviewed certain long range objectives propounded by Col. Robert E. Greer of the same office and went on to list a large number of interim goals, especially in the materiel and logistics areas, as an approach to consideration of the problems by an ad hoc committee.[36] This committee had been proposed by General Bunker, Assistant for Atomic Energy, as a more appropriate body for formulating a broad statement of policy than his office alone. Appointed by the Secretary of the Air Force, it consisted of General Wilson* (Chairman), General Bunker, Maj. Gen. Hunter Harris, Brig. Gen. Alvin R. Luedecke, Maj. Gen. John S. Mills, Maj. Gen. L. S. Stranathan, and Colonel Peterson (Recorder). The committee met at Maxwell Air Force Base 15-18 April 1952, "for the purpose of stating the objectives of the Air Force in the field of atomic energy and of developing policy guidance aimed at achieving those objectives."[37]

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*General Wilson was now commander of the Air War College. The other members were active in the staff, operational, and logistics, phases of the atomic program.

[redacted]

[redacted]

The committee submitted its report to General White, DCS/Operations, on 27 May, who transmitted it to the other deputy chiefs for coordination on 5 June. The most serious objections came from the Office of the DCS/Materiel, which contended that the short term objectives were not clearly defined.[38] However, the DCS/Materiel withdrew these objections to avoid further delay of publication after it was agreed that a second ad hoc committee would be established to consider short range problems.* Transmitted to the Air Staff for final coordination and approval on 14 August, the document was accompanied by the following statement by the Assistant for Atomic Energy, General Bunker:[39]

> The Committee was faced at once with the decision to make as broad and permanent a statement as possible or a detailed and therefore short range statement of policy. The final report of the Ad Hoc Committee submitted by the Committee Chairman, Maj. Gen. R. C. Wilson, on 27 May 1952, reflects a compromise between these extremes. The Committee has stated the relatively permanent goals of the Air Force in atomic energy as long-range objectives and has followed these by a broad statement of policy which will remain firm so long as the long-range objectives remain unaltered. Finally, the Committee has stated short-range policies, which in some instances are recommended actions to be taken immediately, with a view to the development of an Air Force position.... The Air Staff has agreed that the Air Staff agency of primary interest will consider each subject area in Section IV...and will determine implementing details as indicated by present conditions using the broader objectives and policy statements in Section II and III of the report for guidance.

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*After approval by General White the aforesaid ad hoc committee was set up by Maj. Gen. Robert M. Lee, Director of Plans, early in July. Consisting of Colonels, it was directed "to establish a comprehensive Air Force position which would start with National considerations and work down through each step from allocation of resources to tasks to each subsidiary problem," and nine specific problems were called to its attention. The committee reported to the Director of Plans in September 1952 after having coordinated its conclusions with interested sections of the Air Staff, but no further action followed. (Memo for Lt. Gen. Thomas D. White from Maj. Gen. Robert M. Lee, sub: Air Force Position on Atomic Energy Matters, 23 June 1952; memo for D/O, Asst. for AE, D/R&D, D/Plans from DCS/O, same sub., 30 June 1952; Report of Ad Hoc Committee Formulating an Air Force Position on Atomic Energy Matters, Sept. 1952.)

[redacted]

The policy document was approved by the Vice Chief of Staff on 21 August 1952 and copies forwarded to the Air Staff pending publication over the signature of the Chief of Staff, Gen. Hoyt S. Vandenberg, on 11 September 1952 by AFOAT. Distribution was to directors and above at the Headquarters USAF and to the Commanding Generals of the major commands. Instructions were that the document be read by "key personnel." The document was described as "privileged," and therefore to be limited to Air Force agencies.[40]

Six basic objectives for the Air Force were stated in the paper as follows:[41]

1. To bring about a thorough and widespread understanding of the significance of atomic energy in the national security.
2. To capitalize on the military potential of atomic energy to insure the evolution of a concept of war which best guarantees adequate military security at a minimum cost to the U. S.
3. To attain the optimum application of atomic energy to the national scientific, economic, and industrial structure which is a fundamental of the military potential.
4. To attain the maximum stockpile of fissionable materiel and the weapons system relevant to a realistic war concept which makes most effective use of this stockpile.
5. To achieve within the Air Force the full capability to sustain and support Air Force weapons systems.
6. To develop the effective application of nuclear power for military purposes.

To achieve the above objectives the paper described both general and specific policies. In general, it emphasized that the Air Force "must exploit to the maximum the potential of atomic energy in the execution of its assigned missions" and "provide for the delivery of atomic weapons in all cases where Air Force operations promise to be the most effective and economical means of employing fissionable material in war." The document emphasized that the Air Force must proceed

by making full use of existing non-Air Force organizations for support, doing nothing to alienate or weaken them and thus diminishing the national atomic capability, but at the same time making the necessary changes and adjustments to bring Air Force resources to full employment in the national security system. This appeared to relate most directly to the Armed Forces Special Weapons Project, but might also be considered applicable to the Atomic Energy Commission and other military services.[42]

More specifically, the PAE laid down lines of policy in six areas. These may be summarized as follows:[43]

1. Control of those aspects of weapons design (including the warhead) which significantly affect the design and performance of Air Force delivery vehicles is essential.
2. The necessity that the Air Force develop a broad atomic delivery capability requires that all bombers, "appropriate interceptors," and guided missiles with comparable missions be designed as parts of atomic weapons systems, including suitable concepts, tactics, and techniques.
3. The mission of air defense of the United States places upon the Air Force "a particular and extraordinary grave responsibility" to promote the most effective possible means of acquiring knowledge of the atomic capabilities of potential enemies.
4. The special requirements of atomic energy functional activities and the rapid advances in the area necessitate central monitoring of the Air Force program by a special agency for an indefinite period of time to come. It is an objective of the Air Force, however, to develop an atomic capability in all its agencies.
5. Despite the attendant psychological and political complexities, the USAF must develop a full capability to provide atomic energy

materiel support for its air components.

6. Air Force personnel must be given a knowledge of atomic energy as applied to warfare in order to fully exploit this subject. This will be achieved through education and training at all levels and by rotating personnel through agencies actively engaged in the atomic program.

A final section of the PAE provided more detailed guidance within sixteen particular problem areas for Air Force agencies having the primary responsibility. These were as follows: dependence and capability, monitoring the Air Force program, planning considerations, weapons development, nuclear propulsion, thermonuclear weapons, weapons testing and weapons effects, storage of atomic weapons and weapons components, materiel, budget, personnel, medical, Sandia Weapons Development Board, inspection, security information and control, and consideration with respect to U. S. and friendly governments.[44] The specific lines of policy proposed in these areas will be later discussed at appropriate places in the text dealing with the subjects mentioned. In general, however, it may be noted that the actions suggested were directed toward the development by the Air Force of an independent capability in the development, storage, handling, and operational use of atomic weapons for its assigned missions, rather than relying on support from other agencies. Pending the development of the desired capability the support of outside organizations would be accepted in order not to diminish the national military strength, but this would be looked on only as an interim measure. This section of the PAE also contained policy decisions on a number of specific matters affecting the internal administration of the Air Force atomic program and certain specific objectives. These included the follow-

ing: the continued need for special handling of the atomic program at the Air Staff level by a monitoring agency, the importance to the Air Force of the research effort in nuclear propulsion, the need for concurrent development by the Air Force of a thermonuclear delivery system, the need for maintaining a special cadre of officers highly educated in nuclear science and for selecting officers of high capacity for representation on outside agencies, the need for more realistic handling of the security problem in closer accord with normal military procedures, the need for orienting the Air Force medical program to provide for proper handling of the large number of casualties expected to result from atomic warfare.

Unfortunately, the policy document failed to have the effect desired in properly orienting Air Force atomic activities and relationships, especially at working levels. The Air Force Letter on the Armed Forces Special Weapons Project which had been issued in September 1951 naturally had a much wider circulation and continued to play an influential role, while the PAE was largely restricted to upper levels.[45] Accordingly, after considerable delay a movement got under way within AFOAT to prepare and issue an Air Force Letter on the atomic energy program which would digest appropriate parts of the PAE for more general circulation.[46] This was prepared and coordinated within the Air Staff in April 1953 and issued as AFL 20-6 on 4 August 1953.

The new letter stated the Air Force mission in the atomic area as follows:

> The mission of the Air Force in the atomic energy program is to exploit the military application of atomic energy to the maximum extent possible and thereby develop and maintain a preeminent atomic capability. The military application of atomic energy is an essential element of air warfare and is of paramount importance.

[redacted]

Five principal objectives were stated:

a. To bring about a thorough and widespread understanding of the significance of atomic energy to national security.

b. To maintain a current concept of atomic warfare, which will guarantee adequate military security at minimum cost to the United States.

c. To attain the optimum application of atomic energy to the scientific, economic, and industrial structure of the nation.

d. To achieve within the Air Force the full capability to sustain and support Air Force atomic weapon systems.

e. To develop the effective application of nuclear power for military purposes.

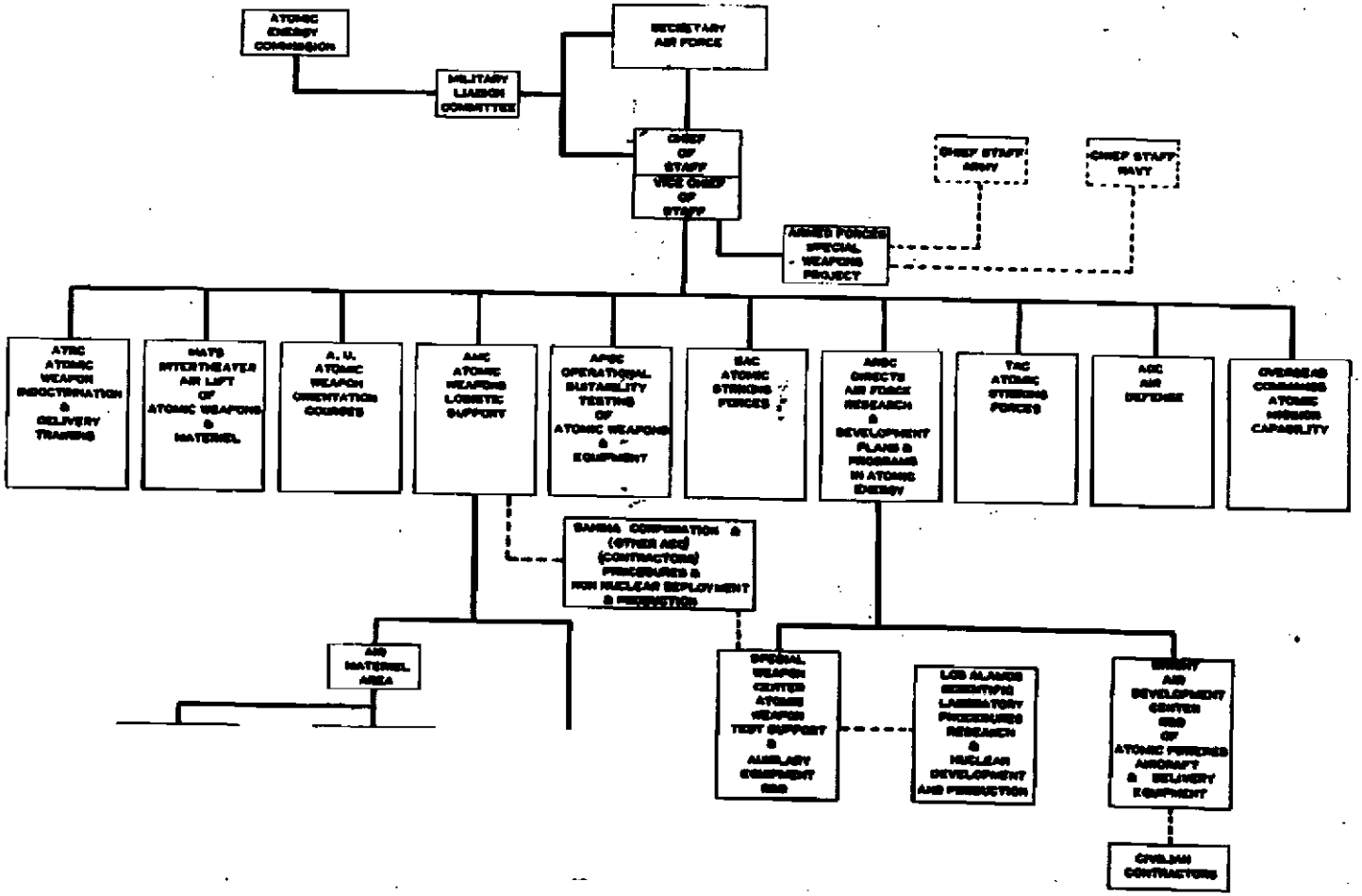
Since the letter was designed to counteract the influence of the previous letter on the AFSWP, a considerable part was devoted to discussion of the exact relationship of the Air Force to that agency. Pointing out that neither the creation of the AEC nor of the AFSWP "relieved the Air Force of its inherent responsibility to continue development of an atomic capability within its own command structure," the letter went on to explain:

> The AFSWP has been charged with responsibilities in the field of atomic energy which are identical to some of those of the Air Force. This is necessary during the interim period in which the Air Force is developing its full capabilities. Therefore, as the Air Force atomic capability expands, a dynamic situation will exist whereby the functions and responsibilities of the AFSWP, as they are related to the Air Force, will require alteration from time to time.

The directive explained that the Air Force command structure for atomic weapons operations was generally identical to that for other weapons systems except for the existence of the AFSWP, which it described as "an interdepartmental agency as distinguished from a joint or a Joint Chiefs of Staff agency" but as having within the Air Force organization the status of a major command.

[redacted]

ORGANIZATION FOR AIR FORCE ATOMIC ENERGY PROGRAM



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The letter emphasized the Air Force responsibility to "insure maximum utilization of those aspects of atomic energy which provide the most effective and efficient means of fulfilling any assigned mission" and directed major commands to "develop the capability to use atomic energy as they presently are required to use other forms of energy in various weapons or devices." The directive also went on to point out a large number of specific atomic energy functions in the various major areas of activity within Headquarters, USAF. Finally, it set forth a policy in regard to security of atomic energy information, control of personnel, and safeguarding of atomic weapons and materiel. Two principal points were emphasized: (1) "that security in technological matters is dynamic and is more likely to be effective if energy is devoted to keeping in the lead than if reliance is placed in static processes such as secretiveness"; (2) that "the Air Force should endeavor to bring atomic energy as nearly into its normal practices as possible."

Air Force Policy Toward the AFSWP

The policy of the Air Force in regard to the AFSWP became more stabilized during 1949 as the result of the failure of its efforts to have the Chief of Staff, USAF, declared executive agent or to bring about the dissolution of the agency and distribution of its functions. It may be recalled that in August 1948 an "interim" arrangement had been established by the JCS of having the Chief of Staff, USAF, declared executive agent for the AFSWP for the implementation of the emergency war plan.* In September the minority proposal that the AFSWP be dissolved, presented by the Air Force members of the MLC Panel on the Organization of Atomic Energy Activities in the National

*See Volume II, Chapter 3G.

Military Establishment, was voted down in the MLC, but passed on to the Secretary of Defense, who possessed the final power of decision. In January 1949 AFOAT recommended that the Air Force MLC members maintain as a primary objective for 1949—"to dismember AFSWP, distribute its functions among the services."[47] In March, no action having been taken by the Secretary of Defense to alter the "interim" arrangement, AFOAT revived the Air Force proposal to abolish the AFSWP, as a project to push forward in the Defense Department.

After a review of AFSWP functions by AFOAT as the basis for a specific proposal, it was concluded that the important logistic function was 95 percent in support of the Air Force and five percent in support of the Navy. Under the plan proposed most of the functions—including research and development, logistic support of the war plans, training, atomic test support, and atomic budgeting for defense requirements—would go to the Air Force as the major using service under the assignment by the Key West agreement of the responsibility for strategic air warfare. Radiological defense would go to the Army and the atomic activities coordinating function to the MLC. By June 1949 the entire Air Staff had concurred; however, the proposal was not put into the form of an action paper to the JCS. Apparently the moment was not considered propitious. It was also suggested that the JCS might be bypassed by submitting the problem to the Secretary of Defense under a current program to review the need for existing boards and agencies. Accordingly, General Schlatter, senior Air Force member of the MLC, transmitted the study to the Chairman, William Webster,* on 2 September 1949, but no immediate action followed.[48]

*He also served as Deputy to the Secretary of Defense for Atomic Energy Matters.

By January 1950, however, General Schlatter had apparently reached an agreement with Webster that the latter would submit a recommendation to Secretary of Defense Louis Johnson immediately prior to Webster's approaching resignation. This would in the main support the Air Force stand in regard to the AFSWP. Accordingly AFOAT began a new effort to coordinate its position with regard to the AFSWP and present this in the best possible light to the proper agencies within the Defense Department. A staff study along with proposed memos from the Chief of Staff to the JCS and from Secretary of the Air Force Stuart Symington to Secretary of Defense Johnson was prepared to be transmitted at the same time as the Webster recommendation.[49]

On 15 March 1950 Chairman Webster transmitted his recommendation to the Secretary of Defense that "Based on a plan drafted by the Chief, AFSWP, the activities of the AFSWP should be sharply reduced to those which necessarily must be supervised by a joint agency for economy and efficiency. All other responsibilities should become a part of the Army, Navy, and Air Force within the framework of their respective missions." The Secretary of Defense referred Webster's paper for comment to the JCS on the following day. There Admiral Sherman, Chief of Naval Operations, and General Collins, Army Chief of Staff, informally indicated their intention to oppose the proposal.[50]

By April it was clear that Secretary of Defense Johnson would not act on the Webster recommendation independently, and since there was no hope of favorable action from the JCS, AFOAT began consideration of another course. A staff study prepared within the office at the time proposed that the Air Force withdraw from the AFSWP piecemeal, assuming functions now performed for it by the latter agency as quickly as possible when this was not prevented by the charter.[51] Pointing

out five basic functions of the AFSWP--training, logistics (including depot and supply functions), research and development, dissemination of information, and command of assigned units--the study stated:

> It is within Air Force capability now to assume function a and b above, provided that certain items of equipment now available only in AFSWP are made available to the Air Force, and that certain agreements now in effect between the AFSWP and the AEC are modified. There is nothing to prevent the CS/USAF from notifying the Chief of Staff AFSWP that the Air Force will assume these functions for itself, and directing him to turn over the necessary equipment and to alter the pertinent agreements. This does not necessarily mean that the AFSWP would cease to perform these functions for Army and Navy; it does mean that a significant portion of the AFSWP reason-for-being would disappear.

The study went on to suggest that the Air Force continue to participate in the monitoring function in research and development performed by the AFSWP as a "listening post," and that the remaining two functions were of relatively slight importance.

Accepting these conclusions as outlining a logical course of action, General Wilson accordingly recommended on 27 April 1950 that the Chief of Staff transmit such a directive to the AFSWP and offered the following explanatory points:[52]

1. The military functions of the Manhattan Engineering District were assigned to the AFSWP because of the lack of service capability to assume these functions at the time.

2. The capability of each service, and particularly the USAF, has increased greatly since the formation of AFSWP.

3. The need of a minimum degree of self-sufficiency is recognized by the USAF. This is essential to insure a proper discharge of USAF responsibility in atomic warfare.

4. As a step to achieving this self-sufficiency, the USAF must develop internal logistic procedures to support its mission. It now has the capability to assume this responsibility.

5. The USAF is prepared also to assume the training of its own personnel.

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[redacted]

6. The issue of the dissolution of AFSWP is not raised. It is assumed that AFSWP will continue in being, with USAF support.

7. The Chief AFSWP is requested to assist the USAF in the establishment of procedures for USAF training and logistics in the field of atomic energy.

General Wilson at the same time presented a proposed letter to the Chief, AFSWP, containing the following significant paragraphs.

> It is my desire that the Air Force begin immediately to undertake the training and logistical functions necessary to accomplish its responsibilities in the area of atomic warfare. This will mean the establishment of courses for the internal training of individuals and units of the Air Force. It will mean also the establishment of supply depots or distribution points to control and account for the distribution of special equipment within the Air Force. It will mean the development of procedures for procurement, maintenance, surveillance, supply, storage, and issue of technical equipment and supplies required by the Air Force and within its charge.
>
> This program should be developed and phased in such a manner as to insure at all times the optimum national capability for waging atomic warfare. The Armed Forces Special Weapons Project must not forfeit its present capability to support the USAF in these acticities until it is evident that the latter has established its internal organization to the point where AFSWP support can be released without compromise to the national war potential.

Although the Chief of Staff decided against such immediate broad scale action, he apparently accepted the concept as a policy guide to be more gradually implemented with the training function to be absorbed first. Accordingly, on 1 May 1950 the Daily Staff Digest stated that 1952 budgetary planning for the AFSWP would be based on the following eight assumptions approved by the Assistant for Atomic Energy:

1. The AFSWP will continue in being.
2. The USAF will conduct its own orientation training.
3. The USAF will train its own crew members.
4. The USAF will conduct initial training of all personnel for Air Force [redacted] regardless of whether they are under Air Force operational command.

[redacted]

[redacted]

5. Maintenance of the proficiency of [redacted] will be the responsibility of the commanders of the organizations to which these units are assigned.

6. As at present, the AFSWP will conduct training for all Army and Navy personnel.

7. The AFSWP will continue to perform all of its other functions for the present.

8. Changes above will be effective 1 July 1951.

In July 1950, following the outbreak of the Korean War, AFOAT again proposed that the Air Force move to have the Chief of Staff declared executive agent, pointing out the effect of the new crisis, but this was discouraged by the Plans Division, DCS/Operations, which suggested waiting at least for completion of the intermediate war plan in order to gain a stronger position.[53] The question of the position and future of the AFSWP remained virtually quiescent, however, for the next year as the Air Force devoted itself to improving its own atomic capability.

The compromise position that had been reached on AFSWP by the services was formalized in July 1951 by the issuance of a new joint directive from the three chiefs of staff which replaced the joint directive of 8 July 1947.* The new directive grouped the functions and responsibilities of the AFSWP under the three heads of technical activities, training, and logistic services. It eliminated such broad grants of authority as "coordination of atomic energy activities," "military participation in research and development of atomic weapons," and "coordination of the activities of the Armed

*This directive was a memorandum from the Army Chief of Staff and Chief of Naval Operations setting forth a detailed description of the AFSWP's organization and functions. It implemented the broader directive of 29 January 1947 by Secretary of War Patterson and Secretary of the Navy Forrestal establishing the AFSWP. (See Volume II, Chapter 3A.)

[redacted]

Forces for developing and effecting joint radiological safety measures." As now set forth, the functions were more numerous but were also more specific and closely described. The idea was repeatedly emphasized that these were intended to assist the functioning of similar activities within the services, but not to replace them, with many to be supplied only "as requested" or "as required." The directive also stated:

> AFSWP will utilize established agencies of the Armed Forces to carry out programs for which suitable facilities already exist. Existing organizational structures will not be duplicated, nor will additional activities be established, when the AFSWP mission can be accomplished by available means.[54]

Nevertheless, many high officers within the Air Force were dissatisfied with the directive. It also developed that, as the result of a misunderstanding within AFOAT, the directive had not been fully coordinated within the Air Staff and that changes proposed as the result of criticisms from the major commands had not been incorporated.[55] These came particularly from the Air Materiel Command and the Deputy Chief of Staff for Development. The Air Materiel Command belatedly stated:[56]

> In general the proposed directive does not conform even in a general sense to Air Force objectives as outlined by the "Twining" and "Wolfe" letters. If permitted to stand as written, it would undermine the state of agreement which had already been reached with AFSWP in the logistic field.

It objected specifically to the provisions under which the AFSWP would furnish technical directives to the services, furnish direction as to minimum technical qualification of personnel, maintain an over-all inspection system, serve as sole liaison between the services and AEC in research and development matters, have responsibility in the development of support of the emergency war plan, control the procurement of all items from the AEC, conduct certain weapons maintenance

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functions, and have over-all atomic training responsibility. In addition it listed numerous other minor instances of undesirable implications and connotations.

Comments of critical tenor also came from Maj. Gen. Donald L. Putt, Acting DCS/Development, who stated:[57]

> Generally, the charter is acceptable if the concept that the AFSWP should be a permanent organization with operational responsibilities is acceptable.

However, he went on to point out that there was nothing requiring that the Project have a permanent existence, since all its functions could be handled through normal staff and command activities. He also asserted, "As written, the charter implies a restriction of service participation in Special Weapons Programs, and could cause Air Force agencies to expect AFSWP to perform functions which should be performed by these agencies," and suggested that distribution of the charter within the Air Force be accompanied by a statement of Air Force responsibilities in the field of special weapons. More specifically he objected, as had the AMC, to the preparation of technical directives by the AFSWP for use within the Air Force, as well as to the implications that the AFSWP should conduct all research and development liaison with the AEC, that it should control the procurement and resupply of AEC furnished items, and that it should administer the control systems and regulations governing accountability and responsibility for Restricted Data items.

The AMC followed up its criticisms by submitting on 21 September 1951 a full proposed revision, an action which only emphasized the embarrassing dilemma in which AFOAT was not placed, particularly since on 25 September the joint AFSWP directive was to be reissued as AFL 20-27 in fulfillment of an agreement with the other services.[58] Many

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officers felt that the AFSWP was now provided with positive policy guidance throughout the Air Force with a resulting enhancement of prestige. On the other hand, a vacuum existed as to Air Force atomic energy policy, since no comparable AFL existed to describe it. In this situation AFOAT apparently recommended against an attempt to secure a full revision, but proposed that the difficulties be dealt with by arriving at an agreed Air Staff interpretation of the AFSWP charter which the AFSWP would be persuaded to accept and by later issuing a new AFL 20-27 which would include an addition setting forth the Air Force interpretation. There is no record, however, that any formal agreement was reached with AFSWP as to an interpretation, or that anything very concrete was done immediately to ameliorate the predicted deleterious effects of the new directive.

The incident did have the effect of emphasizing the need for more concrete and widely circulated policy guidance for the Air Force and thus served to stimulate the drawing up of the official policy statement (Policy-Atomic Energy) the following year and the circulation of AFL 20-6 in August 1953 as the official publication based on it. Meanwhile, AFL 20-27 was quietly allowed to expire in March 1953.[59]

Direct attempts by the Air Force at the top level to reduce the influence and activity of the AFSWP subsided after 1950 in favor of emphasizing the long range effort to build up the Air Force's own atomic capability.* This was seen in virtually all fields—including

*In June 1953 a new effort to have the Chief of Staff, USAF, declared executive agent for the AFSWP was briefly considered within AFOAT. A possible opportunity was provided by the issuance of Reorganization Plan No. 6, which was accompanied by a promise of revision of the Key West agreement to provide for designation of executive agents for all unified commands by the Secretary of Defense. A proposed memorandum for the Secretary of the Air Force was prepared which suggested (Contd)

particularly training and logistics, as well as inspection. Setting forth the now generally accepted policy in early 1952, a high Air Staff officer wrote:[60]

> Since that time the Air Force policy has been to build up its own competence to such a level that it need not be dependent upon AFSWP for support. This has been an evolutionary process, restricted at times by JCS directives calling for AFSWP actions on behalf of the three services.
>
> On the other hand, AFSWP is designated by charter as the "middle man" between the individual services and AEC. It may, therefore, continue in the logistics business for so long as it exists. The job of coordinating and consolidating service requirements for AEC furnished equipment appears to be a useful one. There is no obvious reason, however, for restricting Air Force supply competence because of this AFSWP function. Supply levels, flow rates, and other details are matters for mutual understandings to be reached by reasonable people.
>
> The Air Force desires to develop competence in the weapon development field, gradually taking over its full share of responsibility for development of its own weapons.... We should not hesitate to take on any production job which we can do better than AEC, as efficiency enhances our war-making effectiveness. AEC has custodial responsibility for weapons until otherwise directed by Presidential order. The Air Force desires to have full custodial responsibility for all weapons needed for execution of air war plans. Manning the Operation Storage Sites is a step in this direction, and further expansions should continue until we are content that our independent capability is sufficient. Currently an AEC custodian is technically responsible for weapons in ZI operational storage. This is not

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*(Contd)
that he request the Secretary of Defense to designate the Chief of Staff, USAF, executive agent as a solution to the "cumbersome and awkward arrangement" under which the Chief, AFSWP, reported to three masters. An accompanying proposed memorandum for the Secretary of Defense argued that the Air Force had a majority interest in the organization, pointing out that of the 9,100 personnel trained by the AFSWP in 1952 6,500 were Air Force, that the Air Force manned national and operational weapons storage sites in the United States, that its operational capability in atomic warfare gave it the principal interest in the atomic stockpile, and that the major establishment of the AFSWP was located immediately adjacent to [redacted]. According to a penciled note by Col. D. S. Dunlap the matter was suspended after a conference on 1 July 1953 between representatives of AFOAT and Plans. (Memo for Gen. Bunker from Col. D. S. Dunlap, Sub: Background and Current Data Concerning the Organization and Function of AFSWP, 29 June 1953.)

[redacted]

necessarily permanent nor is it essentially hampering our progress at this time.

AFSWP is used as a political device to keep Army and Navy thumbs in the atomic pie. The Air Force has the capability now to deliver the entire stockpile on designated fruitful targets and is thus the logical parent service for major activities if AFSWP were dissolved. Army and Navy cannot let this occur. They feel that atomic weapons are just as important to them as to the Air Force. The traditional "Navy mission" requires atomic weapons, but they know that delivery of a few dozen would attrit their available aircraft to impotence. They are holding out for the day when delivery by fighters will greatly increase their numerical capability and their stake in this stockpile. The Army cannot let go of their AFSWP slice. They presently have no significant claim on weapons even though they have and a 280 mm. howitzer as dubious tools for national security. The Army, however, looks upon the Guided Missile as the device which will permit them to reascend the throne and become an effective factor in offensive warfare. To do this, they need atomic warheads, so they must hang on to AFSWP to assure getting their share.

In the long run, it appears best that the Air Force develop competence while the others play the politics with AFSWP. Fortunately, AFSWP is more of a political device for those outside to kick around than it is a political hotbed from within.

Three ways in which AFSWP activity continued to expand despite the above policy were in connection with the storage and surveillance of atomic weapons, the adaptation of atomic warheads to guided missiles, and support of atomic weapons test operations. As will be seen later, the Defense Department continued its effort to gain custody of the atomic stockpile from AEC, and the AFSWP seemed the logical organization to operate the National Stockpile Sites, maintain the inventory of weapons, and apply quality control measures for the DOD. Although the new effort to gain custody of the atomic stockpile failed in early 1953, the Secretary of Defense in October designated the Chief, AFSWP, his immediate agent for accounting for, arranging for the distribution of, and advising him as to the technical status of all atomic weapons in DOD custody.[61]

In the case of the development of atomic warheads for guided missiles the Joint Chiefs of Staff had directed the AFSWP in January 1950

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to represent the Department of Defense in coordinating "the liaison required at Sandia Base to implement the approved policies for developing atomic warheads for selected guided missiles."[62] These policies would be determined by the Research and Development Board in collaboration with the Atomic Energy Commission. In October 1951 the Chief, AFSWP, set forth in a letter to the three service chiefs of staff a rather conservative interpretation of its responsibilities as to atomic warheads, emphasizing that these were "analogous to its basic responsibilities in regard to atomic bombs" and that it would have "no responsibilities in connection with guided missile testing, storage surveillance or assembly."[63]

While the AFSWP interpretation was accepted by the three service chiefs, the Air Force letter of concurrence of 2 April 1952 contained the following statement:[64]

> It is to be noted at this time, however, that the Air Force intends to continue to develop its own capabilities throughout the atomic energy program. The responsibilities and scope of activities of AFSWP concerned with present Air Force requirements are undergoing changes and will continue to be subject to change as the Air Force develops its own capabilities. Examples of areas in which such changes have occurred recently or in which they are anticipated in the near future include budgetary, procurement and supply procedures, operation of ZI and overseas storage sites, and conduct of unit training.

The question of the responsibility of the AFSWP in the development of guided missiles with atomic warheads was raised again by the Chief, AFSWP, in January 1953 in letters to the three military service chiefs.[65] Pointing out that the work load of the AFSWP in support of the guided missile liaison officers assigned to Sandia by the services was increasing rapidly, he asked for instructions as to whether he should expand AFSWP activity in coordinating and supporting the guided missile-atomic warhead and similar projects undertaken jointly by the AEC and

individual services. In reply the Air Force stated that this liaison function should be the responsibility of the Special Weapons Center, with the AFSWP performing only liaison connected with the development of the warhead itself.[66] The same arrangement would characterize the joint AEC-Air Force program for the development of emergency thermonuclear capability for the TX-14. Although the replies by the Army and Navy were less uncompromising,[67] the proposed AFSWP expansion into the guided missiles development area was to some degree discouraged. It remained responsible, however, through its control of liaison with the AEC on the warhead for provision of detailed technical guidance on warhead development, assurance that no changes would be made in response to requirements of one service which would adversely affect possible use by another, assurance that conflicts in priority between requirements as to warhead were solved in an equitable manner, and assurance that all services were kept fully informed on all programs and the views of none on any program overlooked.[68]

It may be noted that in the case of the thermonuclear program the Air Force was able to establish the nearest approximation of the situation it really desired in the development of nuclear weapons in that the AFSWP was to a considerable degree by-passed and a direct partnership established with the AEC. This had grown out of the urgent need for an emergency delivery capability for thermonuclear weapons which caused interservice rivalries to be brushed aside. In June 1952 Chairman Dean of the AEC pointed out to Chairman LeBaron of the MLC that the thermonuclear weapon [redacted] 'TX-14) would be tested in the fall and that prospects of success were good.[69] He proposed that the Air Force be designated by the Department of Defense to work directly with the AEC in the achievement of an early

[redacted]

emergency capability. The Defense Department immediately agreed to this,[70] and the Air Force designated the Commanding General, SWC, as project officer.* In February 1953 the program was expanded to include the TX-16 and TX-17.[71] In May 1953 the AFSWP, at Navy insistence that the AFSWP continue to perform its chartered functions and that the Air Force's new activity was not an acceptable substitute, moved to assume a more prominent role in the program. With concurrence of the AEC (Military Application Division) and the three services the Chief, AFSWP, designated the Commanding General, AFSWP Field Command, a fourth principal (in addition to the Director, Los Alamos Laboratories, the President, Sandia Corporation, and the Commanding General, Special Weapons Center) in pursuance of the TX-14, TX-16, and TX-17 programs.[72] The directive from the Chief, AFSWP, also stated:

> The mission of AFSWP has not changed, and the Services not presently participating in the development of the TX-14, TX-16, and TX-17 weapons look to AFSWP to coordinate the requirements of all the services in the general field of the thermonuclear weapons and to present to the AEC and its contractors unified military views and guidance in the development, technical, logistic, and training fields. Furthermore, it is expected that, at some future time, one or more of the weapons now known as the TX-14, TX-16, and TX-17 will be developed to the point where it will be regarded as a stockpile weapon of mark quality in the same way as other weapons in stockpile. At such time, AFSWP must be ready to carry out its normal responsibilities for stockpile weapons, if required.

Since technical guidance for the Department of Defense remained in the hands of the Air Force and since the thermonuclear program increased vastly in importance during 1953 and early 1954 this situation constituted a significant though possibly temporary wedge

*The Air Force had actually already been engaged on an emergency delivery capability program for thermonuclear weapons since February 1950. (See Volume V.) The new arrangement gave the program official DOD sponsorship and a working level cooperation with the AEC.

[redacted]

into an area of AFSWP activity.[73]

The AFSWP gained an important accretion of responsibility in the area of atomic weapons testing as the result of a joint directive of 18 January 1952.[74] For tests within the continental United States it was directed to

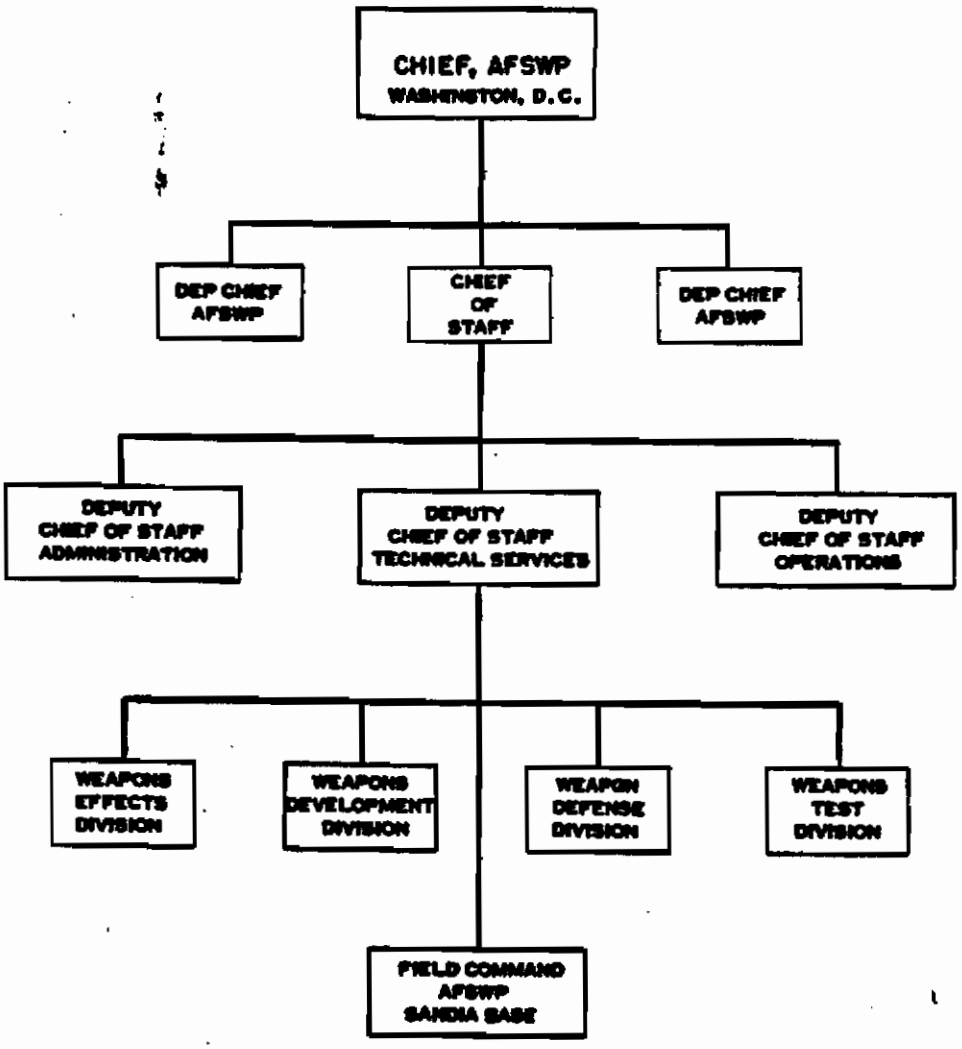
1. Exercise technical direction of weapons effects tests of primary concern to the Armed Forces and the weapons effects phases of developmental or other tests of atomic weapons.

2. Coordinate military participation and assistance in support of the Atomic Energy Commission in the conduct of tests of atomic weapons.

The directive also stated that individuals provided by the Services for the tests would normally be attached to the AFSWP, while military organizations would remain under control of their Services and perform assigned tasks on a mission basis pursuant to requests from AFSWP.

A directive of 24 April 1953 later extended to the AFSWP the responsibility for "technical direction of weapons effects tests of primary concern to the Armed Forces and the weapons effects phases of developmental or other tests of atomic weapons" conducted outside the United States.[75] It may be further noted that the AFSWP had been given a large accession of responsibility in regard to the testing of atomic weapons as early as September 1950, when the Service Chiefs directed the Chief AFSWP to assume, following Operation GREENHOUSE, the responsibility for the preparation of preliminary plans and budgets for the military phases of atomic weapons tests.[76] This also included the functions of coordinating and integrating the requirements of the Services for experimental data obtained through field tests, submitting recommendations as to the technical participation of the Services in these tests, and maintaining continuous review and analysis of results of prior tests. These functions were

ARMED FORCES SPECIAL WEAPON PROJECT



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reaffirmed in the AFSWP directive of 12 July 1951.[77]

Since both atomic weapons testing and the development of atomic warheads for guided missiles continued to grow in importance, the activities of the AFSWP continued to increase during 1951, 1952 and 1953 despite the policy of the Air Force to develop its own atomic capability in all areas and its considerable success in carrying out this policy. As a result of the DOD directive of 16 October 1953 the activities of the AFSWP in atomic weapons custody also seemed likely to increase rather than diminish. Rivalry among the services for atomic weapons and the need for a centralized, coordinated contact with the AEC at the working level seemed to be the principal factors in continuing the existence of the AFSWP far beyond the time when any shortage of military service atomic energy talent existed, the prime argument for the original establishment of the organisation. Although its activities had been circumscribed in certain areas, such as training, the tendency of others to expand and even for new functions to appear made it difficult to foresee any near-term end to the agency.

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Chapter II

RELATIONS WITH THE AEC

The relations of the Air Force with the Atomic Energy Commission were generally harmonious during the period 1949-1953, despite the existence of three major subjects of policy difference. Each of these—control of access by personnel of the military departments to atomic energy information, custody of the nation's atomic weapons, and the degree and type of participation by the military departments in the development of atomic weapons—was either settled or greatly alleviated through new agreements representing concessions to the military viewpoint. Although the Air Force was only one of the three services concerned in these matters and its viewpoint had to be reconciled with those of the other two military departments and of the other agencies of the national security system, it was a prime mover in pressing for a more stable settlement in all three areas. This of course reflected its dominant role among the services in the national atomic program.

Revision of the Military Control System for Restricted Data

As seen in Volume II, the requirement that military personnel having access to Restricted Data (other than the limited amount falling into "Type B") have a special "M" clearance in addition to their normal military clearance severely handicapped the development of an expanded atomic warfare capability in the Air Force.* After AFR 205-3 placed the new policy in effect in September 1948 the backlog of

*See Volume II, Chapter 5C.

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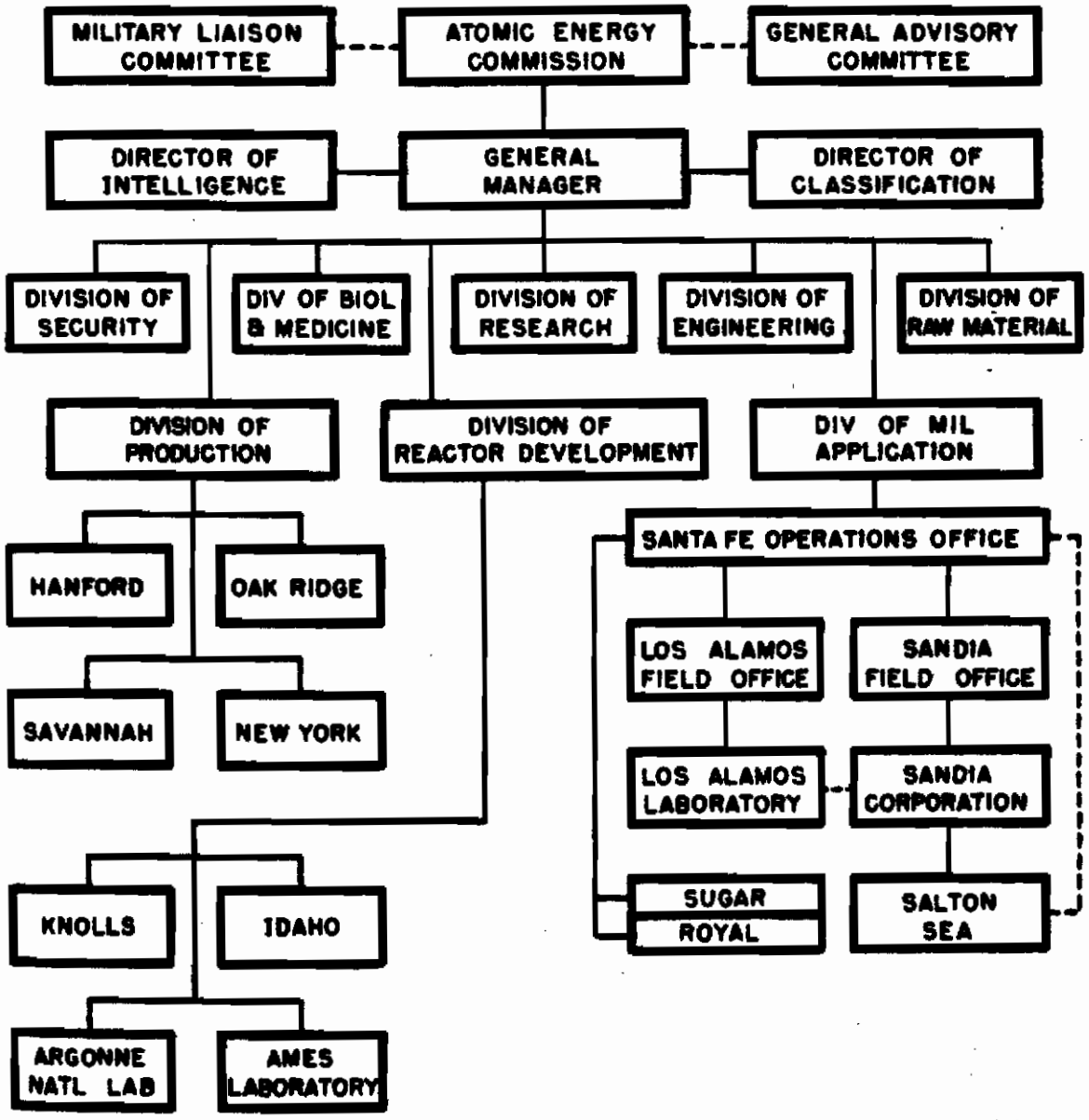
ATOMIC ENERGY COMMISSION



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clearance requests steadily piled up within the Office of Special Investigations, charged with carrying out the necessary background investigations.* Since the processing of an "M" clearance required approximately four to five months and an operational expansion of the Strategic Air Command was underway during 1949 and 1950, it proved to be impossible to reduce the backlog without an inordinate expansion of OSI investigating and processing activities. Because of the severe restriction on the Air Force budget and the reduction to a 48 wing program, this was not considered desirable.

As a result of this acute situation the Air Force undertook early in 1950 to secure a modification of the personnel clearance requirements for access to Restricted Data. Most of the dissatisfaction with the current system based on the Lilienthal-Forrestal agreement of December 1947 emanated from the Strategic Air Command, which had an extensive operational build-up under way. In March 1950 that command had 19,000 clearance requests for access to Restricted Data in process. Meanwhile, the Joint Classification Guide, designed to permit widespread dissemination of Type B Restricted Data with military safeguards only, had failed to alleviate the situation greatly because of its general language and the unwillingness of field commands to interpret it to permit access to Restricted Data without a specific Q or M clearance. The SAC urged simply that operational atomic weapons be removed from the Restricted Data category and protected by military classification only. Failing that, it desired that the Classification Guide be drastically revised and liberalized.[1]

*It should be kept in mind, of course, that the Q-M clearance system was somewhat less restrictive than the older policy pursued by Manhattan District. The increased difficulty arose from the vastly greater number of clearances now being required.

At Air Force urging, the MLC brought the matter to the attention of the AEC in June 1950, pressing for the elimination of the M clearance, handling of Restricted Data received within the Defense Department under appropriate military classification safeguards only, and liberalization of the Classification Guide in the light of experience acquired since its promulgation in January 1949. Negotiations continued during the summer, fall and winter. The Armed Forces Special Weapons Project meanwhile worked to produce a more "realistic" Classification Guide which could be submitted to the AEC for concurrence.[2] At first consideration was given by the AEC to the possible revision of the Atomic Energy Act to provide for an exemption of Department of Defense personnel from the provisions of Section 10, which would permit the use of military safeguards on Restricted Data entering military channels, and also to provide for greater flexibility in grading and handling Restricted Data. It appeared, however, by early 1951 that it might be more expedient to handle the entire matter along the lines originally proposed by the Air Force—abrogation of the Lilienthal-Forrestal agreement and a reinterpretation of the Act to permit elimination of the M clearance and handling of Restricted Data within the Department of Defense according to military standards rather than those prescribed by the AEC.[3]

On 2 February 1951, after concurrence from the AEC and Department of Justice, Secretary of Defense Marshall directed that access to Restricted Data within the Department of Defense and its contractors be governed by military clearance procedures and that such information be classified according to criteria jointly determined by the AEC and DOD. The effect of the directive, when implemented by specific action by the military departments, was to eliminate the M clearance and

special handling procedures for Restricted Data as such. The directive did not affect the Q clearance required for access by Department of Defense personnel to Restricted Data within the possession of contractors of the AEC.[4]

Action was immediately taken by the Air Force to put the directive into effect within Headquarters and the major commands.[5] Considerable delay was experienced, however, in putting the new Classification Guide into effect within the Air Force, it being finally released on 24 April 1951. Revision of AFR 203-5 was delayed even longer as the result of disagreement between AFOAT and the Security Plans and Policy Branch, Inspector General, over whether special handling of Restricted Data should be entirely abrogated.[6] AFOAT was finally successful in its demand for complete elimination as permitted under the Marshall directive.

The Custody of Atomic Weapons

In addition to their campaign for liberalizing their approach to Restricted Data, the military services continued to press actively for full custody of atomic weapons. As previously seen, the first effort in 1948 had been a failure, with control remaining vested in the AEC.* Nevertheless, the Department of Defense was not totally excluded, since the AFSWP remained responsible for providing physical security at the stockpile sites and actually serviced and inspected the non-nuclear components. Custody was less technical and more actual for the AEC in the case of the nuclear components, which were stored

Beginning in late 1948, detailed

*See Volume II, Chapter 2X.

procedures were established for expeditiously transferring weapons for operational use to the services at the order of the President.

Nevertheless, the military services remained quite dissatisfied with this arrangement, which violated the concept of operational readiness and restricted a flexible strategic development. The situation became even more complex as the atomic striking power of the nation increased and as units of the Strategic Air Command were moved overseas, as the Navy demanded weapons for storage and as a tactical air atomic striking capability was developed.

As early as September 1948 the three service chiefs had directed the Chief, AFSWP, to train sufficient personnel to enable the National Military Establishment to take over custody when authorized,[7] and he reported this capability to exist a few weeks later. The subject of custody of weapons was not, however, again raised by the services until March 1950, when the Military Liaison Committee forwarded to the Atomic Energy Commission a Report on Future Storage Requirements for Atomic Weapons, which concluded:[8]

> The Department of Defense should have operational control of the recommended sites, as at the present sites, with present authority extended to include operational control of the non-nuclear components including war reserve kits and spares at the National Sites.

The AEC appeared to receive this conclusion favorably, and for a time it was anticipated by the MLC that the AEC would seek the approval of the President to the transfer of custody of non-nuclear components and to the delegation of responsibility for routine maintenance of

nuclear components.[9]

This, however, was not done, and the matter was worked out on a more limited basis by securing Presidential approval during 1950 for individual transfer from the AEC of non-nuclear components (1) to the AFSWP in May, for training use, (2) to the Air Force in July for storage at overseas bases, and (3) to the Navy in August 1950 for storage Before the end of the year non-nuclear components had been moved to the

By agreement among the military services the bombs deployed to operational bases overseas were under the accountability and security responsibility of the service concerned, while necessary functional surveillance was performed by its units subject to technical direction and control by the AFSWP.[10]

In February 1951 a second Report on Future Storage Requirements for Atomic Weapons recommended the expansion of the existing system of storage sites to a total of

This would take care of an expected increase in the stockpile between the end of FY 1951 and the end of FY 1956.[11] It was estimated that the cost of these additional facilities would be $96,000,000, which would under existing arrangements have to be borne mainly by the AEC. Meantime, in January the AFSWP prepared a review for the NLC of the situation in regard to control of the stockpile, with recommendations for the future. This stated the viewpoint that acquisition by the Department of Defense of nuclear components in sufficient number to match non-nuclear components

[9] For additional details see below, Chapter 9B.

already transferred represented "the irreducible minimum requirement to effect the necessary operational flexibility and to meet the requirements of national security in the present situation and for the immediate future." As alternative possibilities the study pointed that the President might direct (1) that all atomic weapons be turned over to the custody, control, and accountability of the Department of Defense or (2) that a substantial part of the weapons stockpile (both nuclear and non-nuclear components) be turned over to the Department of Defense without Presidential commitment as to when or where they might be used.

The Military Liaison Committee, after further consideration of this problem, on 26 April reached the conclusion that the Department of Defense should again seek the approval of the President to the transfer of the stockpile of atomic weapons, both nuclear and non-nuclear, to its custody from the AEC. The MLC, in forwarding its conclusions to the JCS, contended that the situation as to custody had changed since 1948 in at least five respects: (1) the world situation had greatly deteriorated and the President had declared a state of national emergency; (2) the stockpile had grown to proportions that made problems of surveillance, maintenance, and security beyond the present capabilities of the AEC; (3) the technical competence of the DOD to handle weapons had been established; (4) the deployment of non-nuclear assemblies overseas had forced assumption of full control of these by the military; (5) atomic weapons had become standardized. Arguing that the factors, mainly technical in nature, which had weighed against transfer in 1948 were no longer valid and that the factors, mainly operational in nature, which had favored transfer were more weighty than ever, the

[redacted]

MLC paper rejected specifically the current arrangement as unsatisfactory. It stated:[12]

> The proposition that the military should do all the work of storing, maintaining, and guarding atomic weapons at storage bases, if [redacted]. The seeds would be planted for misunderstanding and delay in the event of emergency as well as impairment of the speed and secrecy with which changes in deployment could be made.
>
> The non-nuclear assemblies of atomic weapons do not in themselves constitute weapons. The immediate availability of some non-nuclear assemblies at advanced bases leads to a sense of security or readiness which does not exist in fact. While the logistic burden may be eased by advanced base deployment, the time element is not appreciably improved, nor is the risk of confusion by the direction of action through parallel channels removed. In the preparation of plans for use, the atomic weapon must be considered as a unit.

Apparently the MLC realized that there was little hope of immediate action on the above proposal because of policy considerations of a high order, as it meanwhile was proceeding with an effort to reach a clear understanding with the AEC as to the exact responsibilities of both the DOD and AEC in the storage and handling of the stockpile. The objective was to arrive at an agreement which would permit the military services the maximum of flexibility in the use of the stockpile weapons and yet satisfy the AEC contention that it could not surrender actual custody without a Presidential directive to do so.[13]

By thus considering the matter of relative responsibilities separately from the custody problem, the situation was simplified and made susceptible to a compromise solution. An agreement was reached at the working level between Carroll Tyler, General Manager of the AEC, and General Montague, Commanding General of the AFSWP Field Command, late in 1950, and this was transmitted to the MLC in January 1951 by the Chief, AFSWP, with certain recommendations for changes. After further negotiations between the MLC and the AEC, the agreement

[redacted]

was concurred in by both of them by 21 August. Responsibilities for handling, storage, surveillance, accountability, and all other stockpile operations were described in detail, without important change in the already existing situation.[14]

Although it is not practicable to review this agreement in detail, a few salient principles may be pointed out. The weapons stockpile was divided into two categories—AEC weapons (stored at the national stockpile sites) and DOD weapons (stored at operational sites.) The Department of Defense assumed responsibility for both the external and internal security of all stockpile structures, but at the national sites the AEC retained certain controls [redacted] The AEC also retained virtually complete responsibility for quality assurance and modification. Functional surveillance was assumed by the Defense Department for its own weapons only, this being retained by the AEC as a responsibility at the national sites, though DOD personnel were to be employed in carrying it out. Records of state of readiness for the stockpile were to be maintained jointly at the national sites and by the DOD for weapons issued to it. Budgeting for all except training weapons and for tools and equipment was to be the responsibility of the AEC. Costs of construction of all initial facilities for storage sites within the Zone of Interior was to be borne by the AEC, while costs of those outside the Zone of Interior were to be borne by the DOD.

The above agreement was finally ratified on 9 November 1951. Almost immediately the question was raised by the AFSWP of the procedures within the Department of Defense in handling the enlarged custody responsibilities. Pointing out that additional operational

storage sites would become active during 1952 and 1953 under the control of the military services, that each service planned to establish its own logistic structure for atomic weapons, and that the types of weapons would soon greatly increase, the Chief, AFSWP, emphasized that certain criteria must be maintained and proposed that he be designated as agent for the Armed Forces in exercising centralized control over all sites.[15] This proposal was in essence supported by the Director of Military Application, AEC, who urged that all agreements between the various services and the Santa Fe Operations Office be alike and that one agency coordinate the distribution of weapons.[16] After consideration by the Joint Strategic Plans Committee and modification of the proposal as the result particularly of Air Force objections, agreement was reached by the Joint Chiefs on 29 February 1952. The term "centralized control" was specifically defined and AFSWP functions more closely limited in the directive actually sent to the Chief of that agency.[17] It may be noted that the AEC and Air Force also reached agreement in May 1952 as to the procedures at the operational sites within the United States placed under control of the Air Materiel Command, these functioning under the same arrangement as that concluded between the AEC and AFSWP.[18]

Meanwhile, while the question of relative responsibilities under the system of divided custody was being settled, the long standing contention of the Department of Defense that it should have over-all custody had been quiescent, but not forgotten. On 11 December 1951 the Joint Chiefs had again raised the issue in a memorandum to the Secretary of Defense in which they expressed the view that the current system of divided responsibility for storage, surveillance, maintenance, and security of the stockpile was harmful to the best interests of the

[redacted]

United States and that the Armed Forces should have sufficient numbers of atomic weapons in their custody to assure operational flexibility and military readiness.[19] Passed to the Special Atomic Energy Committee of the National Security Council, this proposal was included in limited form in a document entitled "Agreed Concepts Regarding Atomic Weapons," which was approved by the President on 10 September 1952.[20] As set forth in this document, the Department of Defense would have custodial responsibility for stocks of atomic weapons outside the Continental United States and for such numbers within the country as might be needed to assure operational flexibility and military readiness. The paper also recognized that the Department of Defense should provide the physical security and services required for the operation of all storage sites.[21]

Apparently at the behest of the NLC, the AFSWP examined the altered custody situation as of 30 September 1952 in a staff study. Currently, the study pointed out, the DOD exercised custodial responsibility for weapons deployed to overseas sites [redacted] training weapons, and maneuver weapons. Working agreements had meantime brought greatly increased DOD participation in weapons production, handling, safeguarding, and maintenance, both of nuclear and non-nuclear components. The AFSWP argued that the growth of the stockpile during the coming decade would place the storage and care of atomic weapons in the category of big business, and that this called for business-like methods and clear-cut functions and responsibilities. Three major problems were considered to be involved: security, availability, and storage. The study proposed essentially that the DOD continue to be responsible for security and that availability be satisfied by the custody of the non-nuclear and

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nuclear components of atomic weapons which are stored at overseas storage sites, [redacted] and in all national and operational storage sites in this country, except for such weapons as might be returned to the AEC for quality inspection--not to exceed five per cent at one time. The AEC would, however, retain legal and "technical" custody of fissionable material. The study also outlined nine practical points of procedure. After concurrence from the MLC on 9 October, the plan was forwarded to the Joint Chiefs and to Secretary of Defense Lovett.[22]

Secretary Lovett used the study as the basis for a new proposal, on which he asked on 21 October the views of the Joint Chiefs. Secretary Lovett proposed that the Special Committee of the National Security Council be asked to recommend to the President the issuance of an Executive Order which would effect a complete reorganization of the custody situation. This would include transfer of the entire stockpile of weapons, both nuclear and non-nuclear components, to the Department of Defense and assumption by it of responsibility for storage and security, as well as the accomplishment of such surveillance, modification, and maintenance mutually agreed on with the AEC as appropriate for storage sites. The AEC would have been left only with responsibility for the establishment of standards for surveillance, for quality control measures, and for major retrofit and modification programs.[23]

Although the Joint Chiefs strongly endorsed this proposal as satisfying their own concept of a satisfactory custody situation, no immediate action was taken, and in January 1953 the Secretary of Defense, after discussions with the Secretary of State and Chairman of the AEC, concluded that the proposed action was inadvisable at that

[redacted]

time, because of the political implications of a major change in the custody situation. In particular, it appears to have been considered desirable to have the matter decided by the incoming administration after time for a thorough review. In March the Joint Chiefs brought the matter to Secretary of Defense Charles E. Wilson, reiterating their view that the national security demanded the transfer and asking that the previous Secretary's decision be reconsidered.[24] They pointed out that the deficiencies of the current system had already been recognized in the Presidential approval of "Agreed Concepts Regarding Atomic Weapons," which provided for military responsibility for weapons outside the United States and a sufficient supply within it to insure operational flexibility, and went on to urge that a complete transfer was necessary.[25] They argued that the present system of the AEC holding custody responsibility but the military manning and operating the sites (except in case of the non-nuclear components of weapons deployed overseas or released for training) was cumbersome, inefficient, and dangerous to security, and went on to propose that in the event of the desired transfer one agency of the Department of Defense, preferably the AFSWP, be charged with responsibility for central control and accountability for entire stockpile.

Secretary Wilson did not elect to take up the matter of transfer of custody of weapons. He did, however, adopt the second part of the proposal and designated the Chief, AFSWP, as his immediate agent for advising him on the technical status of weapons in DOD custody, maintaining a centralized system of accounting for them, and arranging for their distribution to various sites in quantity determined by JCS war plans. The Chief, AFSWP, was ordered to report to the

secretaries of the military departments of their representatives as to a number of other procedures at National and Operational Sites operated by him, including scheduling modification programs, inter-site transportation, internal security, functional surveillance, and budgeting for facilities. The secretaries were made responsible for DOD weapons at overseas and Zone of Interior sites under their control.[26] It may be further noted that the principal existing policy statement on the custody, use, and establishment of requirements for atomic weapons--Agreed Concepts Regarding Atomic Weapons--was repealed by action of the President on 11 January 1954.[27] These actions appeared likely to stabilize the situation in regard to custody for some time to come.

The DOD-AEC Agreement on Weapons Development and Production

Another area which was stabilized by a formal agreement was the relative responsibilities of the Atomic Energy Commission and the Department of Defense as to the control of the development, standardization, and production of atomic weapons. As already seen in Volume II several early weapons development proposals originated within the individual services and were pressed directly with Manhattan District or the AEC.* In 1946 the Army Air Forces and the Navy each made direct agreements with Manhattan for the establishment of nuclear propulsion projects. When the newly established atomic energy organization began to go into effect during 1947 some of these, particularly Project NEPA, were subjected to critical review by the Committee on Atomic Energy of the RDB, which insisted on a statement of military necessity by the Joint Chiefs before it would

*See Chapter 12B. For the course of specific weapons developments after 1948 see Volume IV.

[redacted]

approve the project on a somewhat reduced scale. The attitude of the AEC, which at first looked askance at the project and then developed an interest in it, was also important.

By late 1947 the concept that all proposed new atomic weapons developments should first be dealt with in stated JCS requirements was assuming definite form. [On 29 October 1947 the JCS first stated quantitative requirements for atomic weapons, and the MLC had already proposed in August that a coordinated statement of atomic weapons qualitative requirements be prepared by the AFSWP for JCS approval.] Nevertheless, the Navy proposal for the development of a [redacted] was established by the Secretary of Defense in early 1948 as a project on the strength of approval by the Committee on Atomic Energy of the Research and Development Board, supported by concurrence from the Army. During 1946 and 1947 several statements of Air Force qualitative requirements for atomic bombs prepared by the Tactical and Technical Liaison Committee and submitted directly to Manhattan District or to the AEC through the AFSWP, had experienced very rough going, and not a great deal of attention appears to have been paid to them until December 1947. The entire matter of atomic development requirements was greatly clarified during 1948, partly as a result of the directive in March after the Key West conferences by the Secretary of Defense extending and defining the authority of the Joint Chiefs of Staff. Later in the year the Secretary also established a Weapons System Evaluation Group to assist the JCS in arriving at qualitative weapons requirements. By the end of the year the Air Force had prepared and coordinated within the DOD a complete statement of desired characteristics for implosion-type weapons which was transmitted to the AEC by the MLC in

[redacted]

[redacted]

May 1949.

Nevertheless, arriving at atomic weapons qualitative requirements and the establishment of development projects did not become a one-way activity originating in the Department of Defense. Although the requirement for the Mark V weapon was covered in the over-all statement mentioned above, it had actually got under way during 1948 under the AEC's own sponsorship after concurrence from the Air Force and Navy.* The thermonuclear development project was another case in point. Research in this area was conducted by the AEC during 1948 and 1949 on a limited scale with almost no guidance from the military departments or the Joint Chiefs. Actually, no fixed requirement for the development of a thermonuclear weapon was stated by the Joint Chiefs prior to the actual directive, emanating from the President in January 1950, that a full-scale development project be established.** It should also be noted that both the Air Force and AFSWP played a considerable role in influencing atomic development activities at the working level. The Navy's [redacted] project, NEPS, and NEPA were also instances of full scale service participation in atomic development projects.***

In general it can be said that by the end of 1948 a loose system for arriving at qualitative requirements for atomic weapons had been established, but that it functioned imperfectly, with many exceptions. As the largest user of the end products the Air Force was probably the most dissatisfied of the three services with the existing arrangement, which left the AEC virtually a free hand in determining which

*See Volume II, Chapter 13D.
**See above, Chapter 1 D; also Volume IV, Chapter 5.
***See Volume II, Chapters 13 C, 15 C and D.

[redacted]

development projects it would carry out itself and which allocate to the military services. This is seen clearly in a statement prepared in April 1949 by Generals Schlatter and Wilson, two of the Air Force's principal leaders in the atomic field, who recommended that the National Military Establishment and the Atomic Energy Commission reach an understanding that the military services would engage actively and extensively in atomic weapon research and development.* Arguing that the NME had both a legal and moral right to participation in these activities, they proposed that the AEC continue to be responsible for research and development on the nuclear portions of atomic weapons but that by explicit agreement the NME be allocated primary responsibility for research and development on all other components and on all equipment uniquely associated with atomic weapon systems. To give the NME an immediate definite voice in weapons development they proposed the establishment of a joint AEC-NME technical guidance group which would recommend research and development programs to meet military requirements, these to be subject to AEC and NME approval. They also proposed the dissolution of the APSWP and the allocation of its activities among the services, based on their operational missions as determined by the JCS.[28] No action followed on this proposal, the last part of which suggests some of the difficulties which would have been faced in carrying it out.

Nevertheless, by mid-1951 it had become obvious that with the steady expansion of the national atomic program and its complex organizational ramifications a more clearly delineated system was needed, with accurate and specific demarcation of the relative

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*Maj. Gen. D. M. Schlatter and Brig. Gen. Roscoe C. Wilson were Air Force representatives on the Military Liaison Committee.

responsibilities of the DOD and AEC and description of procedures. The MLC and AEC first attacked the problem directly through the appointment of a Joint Study Group in October 1951, and in December Secretary of Defense Robert Lovett appointed an Ad Hoc Committee headed by R. L. Gilpatrick, Assistant Secretary of the Air Force, to consider the same subject. Meanwhile, in November Secretary Lovett asked for a formal expression of the views of the Joint Chiefs of Staff as to the Department's interest in the use of atomic weapons.[29]

In answer, the Joint Chiefs became the first agency to present a concrete concept, though it was couched in rather general terms. In regard to the development and production of atomic weapons, which was only one of the subjects dealt with by them, they emphasized that the relationship between the AEC and DOD should be that of producer and consumer and that it was the unilateral responsibility of the Defense Department to determine how many and what type of atomic weapons were needed. They conceded that numerical requirements might well be reviewed by the Special Committee on Atomic Energy of the National Security Council with respect to the impact on the national economy and that ideas and suggestions from the AEC as to the nature of new weapons and improvements to old weapons and technical considerations affecting employment would be welcomed. The Joint Chiefs emphasized that since the decision as to whether new weapons filled a Defense Department need remained its responsibility, the Department must also be responsible for stating the military characteristics for these weapons. The paper also took up other phases of warfare and made important policy pronouncements on these, emphasizing particularly the responsibility of the Joint Chiefs to advise the President as to the necessity for the military use of atomic weapons, to prepare

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strategic plans for their use, to direct the forces using them, and to determine delivery methods. The paper also urged that two changes be made immediately in the national atomic energy control system: that the Defense Department be invested with responsibility for custody of all weapons and that it be authorized to communicate Restricted Data to allied nations to the extent necessary to conduct combined operations.[30]

The entire matter of atomic development responsibilities and procedures remained under study until May 1952. At that time, after receiving a report from the Joint MLC-AEC Study Group, Chairman Gordon Dean of the AEC proposed a general basis of understanding with which the Gilpatrick Committee concurred in June. Dean presented five basic points, which may be summarized as follows:

1. The AEC would conduct vigorous programs of warhead research and development directed toward new and radical weapons systems, and would engineer, test, and manufacture warheads and bombs for specific military applications.
2. The AEC and DOD would cooperate fully in the above field.
3. Proposals for new weapons or systems would originate both in the military services and the AEC.
4. When proposals reached beyond the study phase the DOD would assign cognizance to one of its agencies, and the latter would agree with the Military Application Division as to the assignment of specific development, production, and stockpiling tasks, subject to review by both the DOD and AEC.
5. The assignment of development projects would be on the basis of (a) the agency's competence and capabilities, (b) a logical plan for the build-up of this factor, and (c) the desired rate of

accomplishment of the project.

In his reply Gilpatrick, accepting the statement in behalf of the ad hoc committee with concurrence from the Secretary of Defense, suggested that the proposed policies be made the basis for the establishment of detailed implementing procedures, which would be worked out between the MLC and AEC so as to achieve "full understanding of these policies, tasks, and responsibilities at all levels."[31]

The final draft of the agreement was prepared in collaboration by personnel of the AEC (DMA), MLC, and AFSWP. After considerable amendment it was approved by the MLC on 4 December 1952, when it was forwarded to the AEC. After some further delay it was approved by the AEC at its meeting of 19 February 1953 and by Secretary of Defense Charles E. Wilson on 21 March 1953. The document, which was quite detailed and specific, consisted of four parts: (1) Objective, (2) General Outline of Functions and Responsibilities, (3) Synopsis of Functions and Procedures, (4) Definitions.[32]

Although the agreement is too extensive to be reviewed in detail here, its basic premises, which were stated with much greater concreteness than in the Dean-Gilpatrick letters, may be summarized as follows:

1. Unless otherwise provided by law or agreement, the development and production of atomic weapons would be complementary responsibilities of the AEC and DOD.
2. The development and production of nuclear systems were primary functions of the AEC.
3. Exclusive of nuclear systems, responsibilities for the development and production of atomic weapons were to be assigned by joint agreement on each weapon or class.

4. The determination of military characteristics, suitability, and acceptability (standardization) was a primary function of the DOD.

It was agreed that both agencies would pursue aggressively the study of new and radical concepts for military application. Weapons development and production was also broken down into six phases, which were described in detail: (1) weapon conception, (2) program study, (3) development engineering, (4) production engineering, (5) first production, and (6) quantity production and stockpile. The exact role played by each agency in each stage was described in some detail, and all terms were defined.[33]

That the above agreement did not entirely satisfy the Air Force regarding its role in guiding and sharing in the development of atomic weapons is quite certain. There were obvious conflicts, for instance, with some of the objectives stated in the Policy-Atomic Energy (PAE). As late as October 1952 Maj. Gen. Howard E. Bunker, Assistant for Atomic Energy and one of the formulators of the PAE, stated in answer to objections voiced by DCS/Development relative to certain facts of that document:[34]

> The Air Force is responsible for developing atomic weapons; the only qualification being "as necessary in fulfillment of assigned roles and missions." This applies equally to all Air Force weapons, and difference being that we have defaulted in atomic weaponry because it was (1) once falsely believed to be illegal to develop atomic devices and (2) it was easier to let someone else hand us a device professed to be suitable for the air mission. The extent to which the Air Force develops atomic weapons in any time period is a function of management. Whether we take on the physical work in our own laboratories or farm it out to reliable contractors is of no consequence. It is important, however, to realize that we are responsible for getting what we need.

Nevertheless, AFOAT did not oppose the AEC-DOD agreement when it came up the following year, contrary in many respects as it was to the above stated concepts. In explanation, the following comment

was offered:[35]

> In developing the Agreement...the Special Projects Branch oriented the succeeding draft toward recognizing the ultimate DD responsibility for the existence of appropriate weapons, and maintaining the DD freedom in atomic research and development, an issue frequently in question due to general misinterpretation of the Atomic Energy Act and the inertia of programs based on the concept that atomic energy activities are the AEC's private domain.
>
> The Agreement, although falling short of a sound, long-term delineation of responsibilities, provides an interim expedient which will facilitate specific assignment of tasks associated with the development, standardization, and production of atomic weapons.

In the light of the circumstances—including the attitude of the other services, the willingness and demonstrated capability of the AEC in atomic weapons research and development, and budgetary considerations—it is difficult to see any other stand the Air Force could have taken.

The relative responsibilities of the AEC and DOD in atomic research and development were thus amicably delineated, and what had once threatened to become an area of controversy became instead one of routine cooperation. The reasons seem quite clear. During the 1949-1953 period, at least, the AEC had shown itself quite amenable to the military viewpoint as to the priorities to be assigned its various weapon projects as well as quite successful in satisfying specific weapons requirements. It had at its command an impressive array of scientific talent and generous allocations of budgetary funds, both of which it devoted overwhelmingly to weapons development. Indeed the AEC was publicly criticized for laggard action in atomic areas where no military requirement had appeared. All three of the services could show important gains in terms of weapons which made them willing to accept the situation—the Navy's atomic submarine, [redacted] and share of the smaller atomic bombs; the Army's atomic cannon and atomic warheads for its rockets; and the Air Force's variety of fission weapons and soon to be available thermonuclear bomb. Even more important, the

rush of events made it essential to utilize existing systems and organizations functioning without too serious faults to the utmost.

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20. Policy Statement: Agreed Concepts Regarding Atomic Weapons (Annex A to JCS 1848/18).

21. Memo for General Bradley from Robert A. Lovett, SOD, subj: Custody of Atomic Weapons, 21 Oct 1952 (Enclosure to JCS 1848/18).

22. AFSWP Staff Study on Custodial Responsibilities, 30 Sept 1952 (Appendix to JCS 1848/18); MLC Minutes of 9 Oct 1952.

23. History of D/Plans, July-Dec 1952, p. 40-41.

24. JCS 1848/23, 5 March 1953, Enclosure A.

25. JCS 1848/23, Enclosure B.

26. Memo for Sec of Army, Navy, and Air Force, Chm JCS, and Chief AFSWP from Dep SOD, sub: Custody of Atomic Weapons, 16 Oct 1953 (JCS 1848/26, 22 Oct 1952, Enclosure).

27. Note by Joint Secretariat to Holders of JCS 1848/18, 27 Jan 1954.

28. R&R, Asst for AE to D/R&D, sub: Policy on Allocation of Responsibility for Research and Development Programs, 11 April 1949.

29. Agenda Item for MLC Meeting of 4 Dec 1952, Capt J. S. Russell, sponsor, sub: AEC-DOD Agreement Re. Development, Production, and Standardization of Atomic Weapons, 28 Nov 1952; memo for Chm JCS from SOD, sub: JCS Views.

30. JCS 2215, 11 Dec 1951, enclosure.

31. Ltr, Gordon Dean to R. L. Gilpatrick, no sub: 15 May 1952; ltr, R. L. Gilpatrick to Gordon Dean, no sub: 3 June 1952.

[redacted]

32. MLC Minutes of 15 Apr 1953, Announcement by Capt R. P. Hunter; Agreement between AEC and DOD for Development, Production, and Standardization of Atomic Weapons, signed by Gordon Dean, Chm, AEC, and Charles E. Wilson, SOD, undated.

33. Ibid.

34. Memo for DCS/D from Asst for AE, sub: Air Force Objectives, Policies, and Goals with Respect to the National Atomic Energy Program, 28 Oct 1952.

35. History of AFOAT, Jan-June 1953, p. 7.

CHAPTER III

CHANGES IN THE NATIONAL ATOMIC ENERGY ORGANIZATION AND POLICY, 1949-1954

A number of changes occurred within the national atomic energy organization and policy during the period which were to affect the course of the Air Force program either directly or indirectly. The two most important were legislative actions by Congress in 1949 and 1954 under which the National Security Act and Atomic Energy Act respectively were drastically revised. In 1953 the President, acting under the Reorganization Act of 1949, ordered a broad reorganization of the Defense Department. In further implementation of this action the Secretary of Defense, exercising his statutory powers, revised the Key West and Newport agreements of 1948 and effected certain other changes within the Defense Department, including reorganization of its atomic agencies. It should also be noted that the continuing international crises of the period strongly influenced the Air Force's atomic program through increased emphasis on its atomic capability, recognized as the core of the nation's military strength, and by making large funds available for both an operational and developmental expansion.

Changes Within the Defense Department

Early in 1949 a movement gained impetus to carry out a legislative revision of the National Security Act of 1947, which had set up the National Military Establishment as a somewhat loose assemblage of the Departments of the Army, Navy, and Air Force and a number of other agencies, including the Research and Development Board, and the Joint Chiefs of Staff. The whole had been placed

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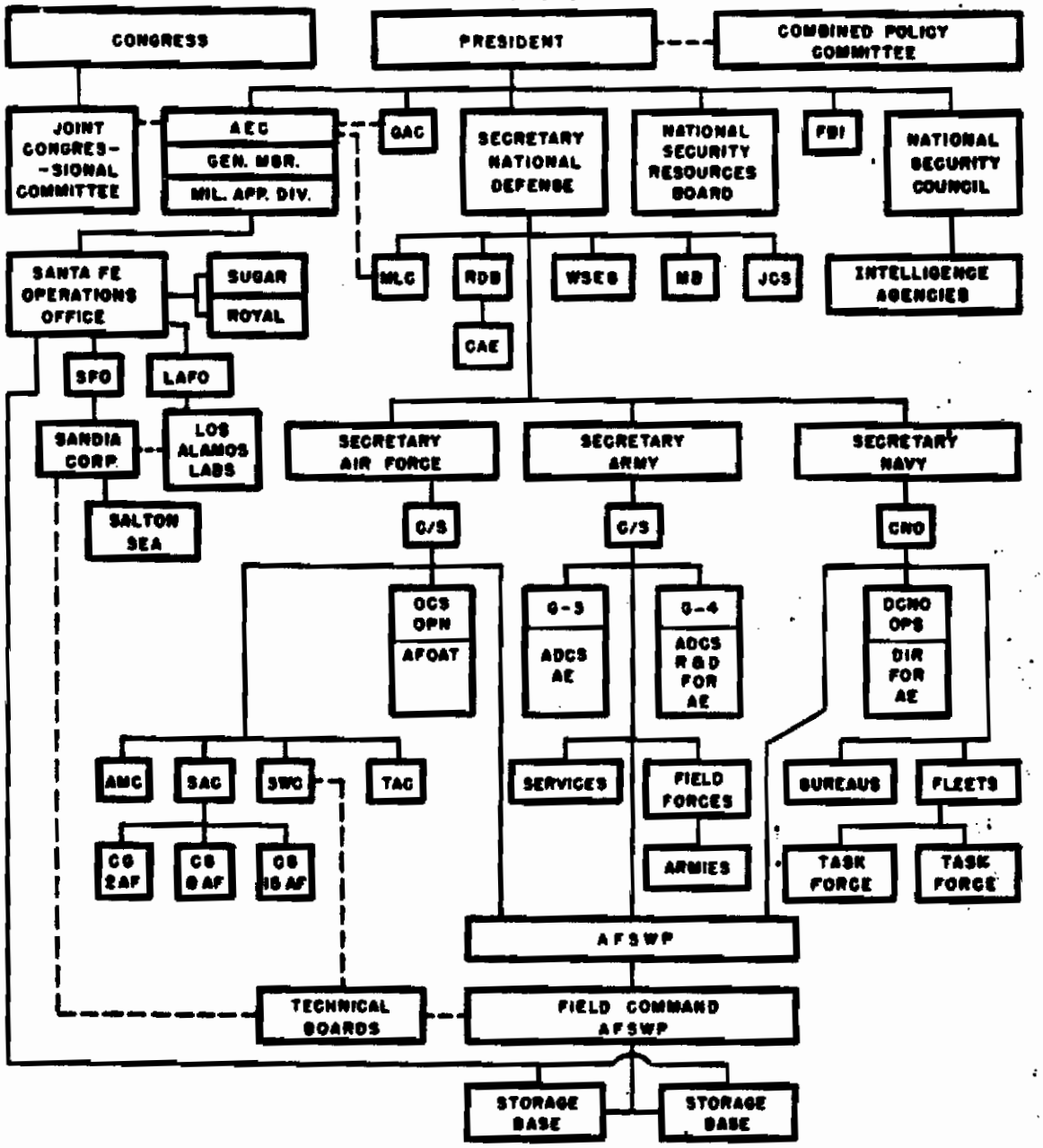
NATIONAL ATOMIC ENERGY ORGANIZATION



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under the general direction of a newly created Secretary of Defense, but the new organization was not recognized as an "executive department," that status being retained by the Army and Navy, and also assumed at that time by the Air Force. The controversy over the budget in 1948, in which the Air Force had won an appropriation for its 70 group program over the objection of the Secretary of Defense,* along with other instances of the unwieldiness of the existing system, convinced Secretary Forrestal and others of the need of strengthening the authority of the Secretary, which he had originally opposed.[1]

With the added support of the Hoover Commission, the amendments were passed and became effective in August 1949. The Army, Navy, and Air Force lost their status as "executive" departments, becoming "military" departments under a new executive department, the Department of Defense. Their secretaries not only lost their cabinet status but their statutory membership on the National Security Council.** At the same time the power of the Secretary of Defense was greatly increased, he being given "direction, authority, and control" over the new department as well as a more specific control over the activities of the Research and Development Board and the Munitions Board. A permanent chairman was also designated for the Joint Chiefs of Staff, and the staff of that agency was greatly increased in size.[2]

As a result of this new legislation the Secretary of Defense issued new charters to the Research and Development Board and the

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*This was actually an empty victory, since the appropriation was made subject to Presidential sanction as to the necessity for expenditure, and this was not forthcoming.

**The Chairman of the AEC apparently was added to the Council shortly after this time as an appointive member, although the new act does not appear to have provided for this.

Military Liaison Committee during the latter part of the year.[3] These, however, did not occasion any material change of function. In fact, the organizational system within the Defense Department for control of the atomic energy program remained quite stable until the advent of the Eisenhower administration in early 1953.

On 30 April of that year the President transmitted to Congress Reorganization Plan No. 6, in which he undertook to effect certain changes within the Department of Defense in accordance with the procedures provided in the Reorganization Act of 1949. The Plan, which was approved by Congress on 20 June and became effective on 30 June 1953, abolished the Research and Development Board, the Munitions Board, and certain other agencies; and provided for the appointment by the President of six additional Assistant Secretaries of Defense and a Deputy Secretary of Defense. This marked the end of the system of boards which had arisen during and after World War II, since each of the total of eight Assistant Secretaries was given cognizance over an area of activity within the Department of Defense.* The Reorganization Plan also strengthened the authority of the Chairman of the JCS by giving him full control over the Joint Staff. In a message accompanying the bill the President spoke of the necessity of more effectively centralizing authority within the Defense Department and of the Joint Chiefs concentrating on their statutory functions of operational planning and of advising the Secretary and President. He stated that to achieve these ends the Secretary was engaged in revising the Key West Agreement to provide that the unified commands

*Both Reorganization Plan No. 6 and the Functions Paper which followed it were based in large part on recommendations submitted by Robert A. Lovett, outgoing Secretary of Defense, to President-elect Eisenhower in a letter of 18 Nov 1952. These were supported in the report on 11 Apr 1953 of an ad hoc committee headed by Nelson A. Rockefeller.

would be assigned to various military departments by the Secretary himself, who would also control their operations through the civilian secretaries of the military departments.[4]

The action forecast to revise the system of control for the unified commands was taken by the Secretary of Defense on 1 October 1953, when he issued a paper, "Functions of the Armed Services and the Joint Chiefs of Staff," which replaced the Key West directive issued by Secretary Forrestal in 1948.* Although the paper left the JCS the power to establish unified commands, it provided that the Secretary of Defense should assign each one to a military department which would serve as the executive agency for it. The channel of responsibility now passed from the Secretary of Defense through the secretaries of the military departments, who were each directed, however, to authorize the chief of staff of the service in question to act in the name of and under the direction of the Secretary of Defense "for the strategic direction and for the conduct of combat operations in emergency and wartime situations." The chief of staff was enjoined to keep his secretary, the Secretary of Defense, and the Joint Chiefs fully informed of his actions. Deprived of its "general direction of all combat operations" as provided in the Key West Agreement, the JCS was left essentially as a planning and advisory agency for the Secretary of Defense and the President. The new paper further increased the authority and degree of control exercised by the Secretary of Defense by providing in an added preliminary statement that no function in any part of the Department should be performed independently of his "direction, authority, and control" and by provision

*The new directive had been concurred in by the Joint Chiefs on 13 September 1953. They suggested two slight revisions.

[redacted]

that all operations by the Armed Forces in pursuance of their common functions should be carried out under his direction. Literally interpreted, the directive gave him full and direct control over all elements of the Armed Forces subject only to the authority of the President.[5]

Aside from the above described changes in the operational control of the unified commands, there were only a few additional revisions of importance in the document. The functions of the individual services, for instance, were left entirely unchanged. Provision was made for co-equal status of the Commandant of the Marine Corps with other members of the JCS on matters directly concerning that agency, but this merely recognized what had already been specifically provided for by statutory legislation.*

On 25 July 1954 the "methods of operation" of the Joint Chiefs of Staff were further described at some length in a new directive by the Secretary of Defense.[6] Although the procedures to be followed within and by the Joint Chiefs of Staff were set forth in some detail, their functions or responsibilities do not appear to have been either lessened or enhanced to any material degree. Probably the greatest amount of emphasis may be said to have been placed on the importance of the Joint Chiefs assuming a broad perspective in dealing with their problems, they being enjoined to ignore service differences; give due weight to economic, industrial, and scientific factors; and establish a close working arrangement with other agencies of the Department of Defense.

In implementation of Reorganization Plan No. 6, the functions of

*This is to be found in Public Law 416, 82d Congress.

[redacted]

the Committee on Atomic Energy of the Research and Development Board were temporarily suspended on 14 April 1953, along with those of its parent organization.[7] The RDB was reconstituted as the Office of the Assistant Secretary of Defense for Research and Development in June 1953, and in January 1954 there was established under it a Research and Development Coordinating Committee on Atomic Energy.[8] As reorganized, the Committee performed the same general functions as the old Committee on Atomic Energy (CAE), but was constituted and operated in a somewhat different manner. A member and deputy member were to be designated by each secretary of the three military departments and by the Assistant Secretary of Defense for Research and Development. The latter would also designate the chairman and provide the supporting staff. Provision was also made for the designation of representatives by the Chief, AFSWP, and the Chairman of the Atomic Energy Commission. The Committee was enjoined to "have due regard for the statutory functions of the Military Liaison Committee." In addition to the Committee itself a Technical Advisory Panel on Atomic Energy, appointed by the Assistant Secretary of Defense, was established with the function of supplying advice and guidance to the Committee.

This reorganization does not appear to have altogether clarified the situation as to the control of research and development projects in atomic energy. In April 1954 the Assistant Secretary of Defense for Research and Development complained that the new Coordinating Committee on Atomic Energy had been ignored by the JCS in approving and transmitting to the AEC two new development projects requested by the Air Force.[9] He pointed out that proper procedure called for his review of all requirements for atomic weapons

approved by the JCS to determine whether new development was involved. If this were the case, approval by the Coordinating Committee would be required before DOD funds could be released for its share of any joint AEC-DOD development. It appeared likely that the Assistant Secretary would win his contention as far as participation in the purely research and development aspect of the problem of determining atomic military requirements. It was the viewpoint of the Air Force that the JCS should maintain firm control over operational atomic weapon requirements for an indeterminate period to come.[10]

The position of the Air Force relative to the other services steadily improved during the period 1949-1953, although not to the extent desired by some of its leaders. Although Secretary Forrestal's balanced force concept had been established during 1948, the same year had also seen the Air Force's atomic capability recognized as the most vital element of the nation's military strength.* The JCS itself had tied the projected strength of the Army and Navy to the 70 group program, which had overwhelming Congressional support; and although this was reduced somewhat to 66 and later to 48 groups during the economy drive of 1949, the strength of the Army and Navy was reduced accordingly. It was also significant that the JCS had formally included the SAC within the Unified Command Plan with the Chief of Staff, USAF, as executive agent. He also continued as executive agent for AFSWP for the implementation of the emergency war plan. The Air Force's position was further strengthened as the result of the B-36 controversy in late 1949, when charges from high Naval sources that the B-36 had not been carefully evaluated and that procurement procedures had been improper collapsed before a

*See Volume II, Chapter 4.

Congressional investigating committee.

The investigation was the occasion of a direct attack by high Naval officers on the concept of strategic atomic warfare as supported by the Air Force.[11] This took two main and somewhat contradictory lines—one that the atomic bomb was much less effective than supposed and the other that its use against the enemy cities would be immoral. These arguments failed to win any extensive Congressional support, and the decision by the President in early 1950 to accelerate the development of the thermonuclear bomb along with the assignment by the DOD to the Air Force of the responsibility for developing an early capability for its delivery seemed on the other hand almost a full acceptance of Air Force strategic theory.

With the outbreak of the Korean War the Air Force received another great impetus. Its program objective was raised from its current 48 successively to 58, 80, 95, and 143 wings, the latter to be achieved by the end of FY 1954. The last increase was to be carried out unilaterally without further increase of the other armed services.* This was by unanimous decision at all levels, including the Joint Chiefs, the Secretary of Defense, the President, and the Congress. In 1953 the goal was cut back to 120 wings, but was soon restored to 137, almost the previous level.*

It should be remarked that in 1951 the concept, established in 1946, of maintaining the Air Force's atomic capability centered within a strategic atomic striking force, later organized as the SAC, had been abandoned in favor of the objective of giving all bombers in the Air Force an atomic capability.[12] In January of the same year the Vice Chief of Staff, USAF, directed concerted action

*See below, Chapter 8A.

to insure the earliest possible tactical atomic capability, and in August the TAC was directed to organize, equip, and train a tactical atomic air force for deployment by April 1952.[13] The resulting unit, the 49th Air Division, was later transferred to the [redacted] as part of the USAFE with a retardation mission.*

National Policy on the Employment of Atomic Weapons

During the period 1946-1948 a fairly well marked policy in regard to the use of atomic weapons by the United States had emerged, and there was little if any alteration in this from 1949 to 1953. The latter period witnessed a further great increase in international tension which served only to confirm the policy of regarding atomic weapons as a major instrument of national security. The only official restriction on the use of the atomic bomb by the United States had been the terms of the Quebec Agreement of 1943, under which the United States and the United Kingdom had pooled their atomic development programs. This executive agreement, which provided that the atomic bomb would not be used against a third party without the consent of both nations, was superseded on 7 January 1948 by a modus vivendi which nullified all agreements existing among the United States, the United Kingdom, and Canada in the atomic field.[14] Although henceforth there was no official restriction on the use of atomic weapons by the United States, the subject continued to have a strong political flavor, both internationally and nationally. This meant essentially that military considerations alone would not determine a decision on the use of atomic weapons, although there was little if any doubt that they would be promptly employed in any open warfare with the Soviet Union.

*See below, Chapter 5B.

[redacted]

As seen in Volume II, the Atomic Energy Act of 1946 placed no restriction on the right of the President, as Commander-in-Chief of the Armed Forces, to equip them with the atomic bomb and to order its employment like any other weapon. Saying nothing of the manner of or circumstances determining military employment, the Act merely authorized him to direct the Atomic Energy Commission "to deliver such quantities of fissionable materials or weapons to the Armed Forces for such use as he deems necessary in the interest of national defense."* [15] In its explanation of the provisions of the Act the Special Committee which had prepared it merely stated regarding this section: "In view of their enormous military significance, atomic weapons are subject, under the bill, to full

*No essential change was made in the wording of this section (6(a) (2)) in the revised Act of 1954, where it appears in Chapter 9, Section 91.b. Unfortunately a rather widespread impression has grown up within the Department of Defense that one or both of the atomic energy acts prohibits the use of atomic weapons without specific Presidential sanction. That this is not the case can be seen by reading this section, which is the only one referring to the subject of military use. The Congress here established the manner of transfer and deliberately refrained from placing any restrictions on military use, thus giving the President, as Commander-in-Chief of the Armed Forces, a carte blanche. By authorizing the President to have atomic weapons transferred to the Armed Forces, they were placed thereafter in the category of other weapons with which the services were equipped. The President's control over the use of weapons actually in the possession of the Armed Forces derives from his Constitutional powers as Commander-in-Chief, and these permit him to prohibit or authorize the use of any weapon from bayonets to thermonuclear bombs as long as the weapon is not specifically outlawed by a formal treaty having Constitutional force. It is doubtful that the Congress has any authority within this area, and any restriction on the manner or circumstances of the use of atomic weapons or even procedures to be taken prior to their use might well have been considered to be of doubtful legality and even an outright intrusion on Presidential powers as described in the Constitution. While the Congress can and frequently does pass on the selection of weapons by the Armed Forces through its investigative powers and control of the necessary appropriations, this is quite another matter than determining the circumstances of their use.

control by the President as Commander-in-Chief." All determinations as to production rates, custody, and transfers are to be made by him.[16]

In early 1948 the question of the use by the United States of atomic weapons was discussed in high governmental circles for the first time since the end of the war. This was doubtless related to the continuing impasse in the United Nations over the control of atomic armaments and the intensification of the Cold War culminating in the Communist coup in Czecho-Slovakia and the Berlin Blockade. Secretary of the Army Kenneth Royall announced his intention to raise the question of United States policy on atomic warfare at the National Security Council meeting of 20 May 1948. He stated that the position of the United States with respect to the employment of atomic weapons and the governmental organization for the expeditious application of atomic warfare required early and careful review.[17] Two top members of the Air Staff at this time expressed viewpoints to Secretary of the Air Force Symington which reveal Air Force policy in the matter. Expressing opposition to raising the question at all because of the possibility of raising doubts regarding possible non-use of the bomb, Chief of Staff Vandenberg urged that since the matter had been raised it be limited to discussion only.[18] Maj. Gen. S. E. Anderson, Director of Plans and Operations, recommended to Symington that he urged the Council to break the problem properly into two parts and consider only the first—the position of the United States toward the employment of atomic weapons.[19] The second—the specific governmental organization for the expeditious application of atomic warfare—would be left to the War Council, on which only the National Military Establishment was represented. He stated the current Air Force position as follows:

a. The use of atomic weapons in any future conflict is essential if this country is to avoid military defeat.

b. The actual planned use of atomic weapons may, in itself, achieve victory.

c. If the use of atomic weapons does not accomplish victory, it will establish conditions under which a reasonable assurance of victory may be achieved.

After discussion, during which the Secretary of State made known his opposition to an irrevocable determination to use the atomic bomb in the event of war, the National Security Council on 3 June 1948 directed its staff to prepare a report on the position of the United States with respect to the initiation of atomic warfare in the event of war, including consideration of the time and circumstances of employment, and the type and character of targets against which the atomic bomb would be employed. The study was completed on 10 September 1948 and transmitted to the Joint Chiefs of Staff for comment before consideration by the National Security Council as [ ] On the recommendation of the Joint Strategic Survey Committee the JCS quickly approved the main conclusions, stated in paragraphs 12, 13 and 14, on September 15. The study was then considered by the National Security Council, and the following day (September 16) the Council approved the conclusions except for paragraph 14, which was apparently discarded as repetitious.[20] Now designated [ ] the paper in general recommended against a fixed determination to use or not use atomic weapons or to describe the time and circumstances under which they would be used. The summarizing paragraphs stated simply:

12. It is recognized that, in the event of hostilities, the National Military Establishment must be ready to utilize promptly and effectively all appropriate means available, including atomic weapons, in the interest of national security, and must therefore plan accordingly.

13. The decision as to the employment of atomic weapons in the event of war is to be made by the Chief Executive when he considers such decision to be required.

The above statement, which had the status and force of a Presidential directive,* represented the only official policy on the use of atomic weapons by the United States for the entire period of this history. On 6 April 1949, however, President Truman did publicly elaborate on this policy somewhat by stating his willingness to order the use of atomic weapons "if necessary."

During the early part of 1950 the entire strategic policy of the United States was reexamined in the light of the Russian development of an atomic bomb. The final report was prepared by the NSC staff after conferences with such prominent scientists as James B. Conant, J. Robert Oppenheimer, Chester L. Barnard, Henry D. Smyth, and Earnest O. Lawrence. After concurrence by the JCS with certain reservations, it was approved by the Secretary of Defense and Secretary of State. The principal conclusions were approved by President Truman as a statement of national policy on 30 September 1950 as NSC 68/2. The paper reaffirmed the objectives of the United States with respect to Russia as previously stated in NSC 20/4. To cope with the Russian threat, now greatly intensified by the development of an atomic weapon, it outlined a substantial increase in air, ground, and sea strength; atomic weapon capabilities; and air and civilian defenses. The policy on the use of atomic weapons remained unchanged, the paper rejecting the idea of declaring a policy of non-use of atomic weapons unless used by the other side.[21]

*The President served as presiding officer with the power to negate or approve all actions by the council.

By the summer of 1950, when the second great post-war crisis erupted, it had become customary to refer atomic matters coming up within the National Security Council to a Special Committee consisting of the Secretary of State, the Secretary of Defense, and the Chairman of the AEC.* On 25 August 1950 the President notified the Committee of his decision to deploy non-nuclear components to over-seas areas and of his intention to have it advise him on any further actions.[22] On 30 November 1950 President Truman again publicly confirmed his willingness to use atomic weapons, stating:[23]

> Consideration of the use of any weapon is always implicit in the very possession of that weapon.
>
> However, it should be emphasized, that, by law**, only the President can authorize the use of the atomic bomb, and no such authorization has been given. If and when such authorization should be given, the military commander in the field would have charge of the tactical delivery of the weapon.

He also indicated to newspaper reporters that he had already considered the use of atomic weapons in Korea, following the serious defeat suffered by the American forces. This occasioned great international excitement and provoked an immediate visit to Washington by Prime Minister Clement Atlee of Great Britain. The result was a joint communique on 8 December in which President Truman stated that it was his hope that world conditions would never call for the use of the atomic bomb, and that it was also his desire "to keep the Prime Minister at all times informed of developments

*The Special Committee was apparently first established in November 1949, specifically to advise the President on the proposed project to develop a thermonuclear bomb. (Ltr., President H. S. Truman to Ex. Sec., NSC, 19 Nov 1949.)

**Since the Atomic Energy Act of 1946 says nothing of this matter and no other law on the subject existed, the President apparently referred to the Constitutional provision giving him sole command of the Armed Forces and the implied right to authorize or prohibit the use of any particular weapon.

which might bring about a change in the situation." This, of course, did not alter the stated determination to use atomic weapons if necessary.[24]

Early in 1951 the National Security Council apparently considered that the time had arrived to establish more clearly defined procedures for reaching a decision as to the use of atomic weapons and directed its staff to prepare a study on the subject. The study, transmitted for comment to the Secretary of State, the Secretary of Defense, and the Chairman of the Atomic Energy Commission, proposed that any recommendation for use originate with the Joint Chiefs of Staff and that subsequently the President secure the views of the Special Committee on Atomic Energy of the NSC and, if time permitted, of Congressional leaders before reaching a decision.[25] The Joint Chiefs, asked for comment by the Secretary of Defense, strongly opposed the suggested fixed procedures as an imposition on the Constitutional authority, functions, and duties of the President and of the statutory functions of the JCS as defined in the National Security Act of 1947.[26] It was obviously the JCS viewpoint, as evidenced in these and other papers, that if the atomic bomb was to be retained in its status as a special weapon, whose use would hinge on the personal decision of the President, no further impediments should be placed in the way of a decision than a reliance on the position of the President as head of the Armed Forces directly advised by the military chiefs and by such other advisers as he chose to call.

Nevertheless, although the specific procedures described were not established, the President did direct the Special Committee on Atomic Energy of the National Security Council to pass on the directives which he had to make in the atomic area which affected all

three of the departments represented on the committee. According to a statement in the Presidential atomic energy policy paper, "Agreed Concepts Regarding Atomic Weapons," approved on 10 September 1952, this was interpreted to mean that the President wanted the advice of the Special Committee before any decision with respect to the major production objectives of the atomic energy program, the preparatory deployment of atomic weapons, and the use of atomic weapons. A further statement added that this, however, was not to be interpreted as limiting the statutory function of the Joint Chiefs of Staff as the principal military advisers to the President. The paper also stated specifically that in the event of a positive decision the President would authorize the Secretary of Defense to use atomic weapons under such conditions as the President might specify.[27]

National strategic policy was twice reexamined during 1953 by the new administration, resulting in two summaries of policy. NSC 153/1 appeared in June,* but was soon supplanted by NSC 162/2, which was approved by the President on 30 October. With regard to military

*NSC 153/1 was approved by the Council on 10 June 1953. This paper, which was described as superceding NSC 20/4, 68/2, 135/3, and Part One of 149/2, described the Soviet orbit as having a growing military capability, particularly an atomic and possible thermonuclear capability, which might give it within a few years the power to damage the United States critically. It proposed countering this threat by emphasizing the offensive capability to inflict massive damage on the Soviet war-making capacity, by building a Continental defense system sufficient to prevent disaster and preserve a mobilization base, and by strengthening civil defense (including a reduction of urban vulnerability). The paper did not specifically take up the question of the use of atomic weapons by the United States, although their use was certainly implied. The preliminary nature of the paper, actually an early version of NSC 162/2, was seen in that an Annex, U.S. Objectives vis-a-vis the U.S.S.R. in the Event of War, was taken without change from NSC 20/4 of November 1948. A note stated that this section was under review and was continued in effect as a response to NSC 79. (Enclosure to JCS 2101/93, Decision 5 June 1953.)

policy toward the Soviet Bloc, the principal differences were a shift toward greater concentration of military forces and a greater emphasis on massive atomic retaliation as a deterrent to aggression, together with a stated determination to thereby reduce defense costs and lessen the strain on the national economy.[23]

With special reference to atomic weapons, the paper concluded that they had given Russia a continuously mounting capability to inflict serious damage on the United States, but that at the same time they provided the major deterrent to Russian aggression. They were described as thus indispensable for American security, and thus to be considered as available for use in war as any other munition. This policy statement was soon implemented by the movement of nuclear cores overseas for the first time to certain designated locations.*

Meanwhile, there was little or no indication that any effective system for the international control of atomic energy and the elimination of atomic weapons would be adopted. As seen in Volume II of this history, the above two elements had both appeared in the plan presented to the United Nations Atomic Energy Commission in June 1946 by the American delegate, Bernard Baruch.** The Baruch plan, based in turn on the Acheson-Lilienthal Report, had advocated the establishment of an International Atomic Development Authority with the following principal powers:[29]

1. Managerial control or ownership of all atomic energy activities potentially dangerous to world security.

*See below, Chapter 9.

**See Volume II, Chapter 14.

2. Power to control, inspect, and license all other atomic activities.
3. The duty of fostering the beneficial uses of atomic energy.
4. Research and development responsibilities of an affirmative character intended to put the authority in the forefront of atomic knowledge and thus to enable it to comprehend, and therefore to detect, misuse of atomic energy.

The plan also called for the automatic punishment of any nation found to be illegally in possession of fissionable material or to be engaged in the manufacture of atomic weapons. This of course meant that the veto power held by the permanent members of the Security Council on actions by it must be abrogated. It also implied that all major weapons in the hands of any nation would be destroyed and that the United Nations would itself control a police force of sufficient size to deal with any malefactor, although details of these procedures were left to later considerations.[30]

The Russian government in essence rejected the Baruch plan as "an unwarranted infringement of national security." It proposed instead that all nations destroy their existing stocks of atomic weapons, exchange atomic information, and reduce their other armaments on a pro rata basis prior to agreeing on any plan of international control. Although it indicated that it would agree to a limited form of inspection, the Soviet government refused to consider the surrender of the veto power over actions by the United NATIONS Security Council against a nation violating the agreement. Russia did not alter its position during discussions within the United Nations Atomic Energy Commission extending to May 1948. The Commission overwhelmingly voted in favor of the American plan, which was also approved by the

United Nations General Assembly on 4 November 1948.* Repeated efforts were made by the United States and other nations to resolve the deadlock during the period 1949-1950 without avail. On 11 January 1952 the United Nations Atomic Energy Commission and the Commission for Conventional Armaments were merged into the United Nations Disarmament Commission, and even this move toward simplifying the situation was bitterly resisted by Russia and its satellites.[31]

On 8 December 1953 President Eisenhower, answering in a personal address a resolution of the General Assembly proposing that the Disarmament Commission seek through a subcommittee of the principal powers for an acceptable solution to the problem, stated the readiness of the United States to meet with other nations involved to seek the desired solution to the atomic armaments race. He also proposed that the United Nations act immediately as a further step to establish an international atomic energy agency to which all governments would contribute fissionable material "to the extent permitted by elementary prudence." The agency would devote itself to peacetime applications of atomic energy. Although extensive discussions were held between the United States and Russia during the first part of 1954 on the subject of the proposed agency, the Soviet government notified the United States on 9 May that it would participate only on the basis of a prior prohibition of atomic weapons in line with its earlier stand. Although it appeared that another impasse had been reached, President

*It may be noted that the Joint Chiefs of Staff approved the United States position on international control on 14 June 1949. (See JCS 1669/15.)

Eisenhower announced on 19 May that he intended to proceed with the plan without Russia. Subsequently the Atomic Energy Act of 1954 specifically authorized him to participate in an International Pool for the peacetime use of atomic energy.[32]

Although the Air Force participated in the above development of an established national policy with regard to the use of atomic weapons only indirectly, through such channels as the Joint Chiefs of Staff, it nevertheless developed during the period 1949-1953 a rather detailed viewpoint as to the proper national defense policy, which was increasingly centered on the use of atomic weapons to counteract various advantages in manpower and geography enjoyed by Russia. These viewpoints were set forth specifically in October 1953 by Major General R. M. Lee, Director of Plans, in connection with the review then under way by the JCS on various aspects of the national security policy. The fourteen principal points, most of which related directly or indirectly to the employment of atomic warfare by the Air Force, may be concisely summarized as follows: (1) that atomic weapons have a revolutionary and decisive importance; (2) that the major threat to the security of the nation was from the USSR; (3) that force in being constituted the major deterrent to aggression; (4) that a more aggressive Cold War was desirable, even at the threat of war; (5) that the United States should engage in peripheral wars only if no limit is placed on weapons and its capability to engage in general war is not compromised; (6) that greater reliance should be placed on nuclear weapons by the United States in order to exploit technological advantages and avoid a protracted attrition of resources; (7) that the offensive striking force must possess the ability to inflict massive damage on the

Soviet war making capacity; (8) that the United States must be assured survival from a nuclear attack through complementary action by an offensive deterrent force destroying the enemy force at its base and by a continental defense force adequate to prevent a decisive attack; (9) that the Federal budget should not be balanced at the expense of the national security; (10) that foreign aid should be concentrated on the United Kingdom, France, Germany, and Japan, and to less extent on Italy, Turkey, Greece, Yugo-Slavia, and Formosa; (11) that D-day forces should take priority over post D-day mobilization programs; (12) that Western Europe must be denied to the USSR and the United States must therefore continue active participation in NATO; (13) that the United States should seek to establish a strong Japan and to prevent Communist expansion in Southeast Asia; (14) that because of the importance of the Middle East for oil and bases, Western Powers must accept responsibility for military defense and should seek to establish a politically and economically stable situation there.[33]

Revision of the Atomic Energy Act of 1946

Although the Atomic Energy Act of 1946 itself had pointed out the many unknown factors in the field and probable need for revision, there seems to have been a universal reluctance to tamper with the Act for several years after its passage. This showed up particularly in the prolonged controversy between the AEC and DOD over the interpretation of the security provisions. Both parties seemed unwilling to approach Congress for a clarifying amendment, agreeing instead on a somewhat cumbersome compromise which ultimately had to be discarded as unworkable.* As a result the first four amendments

*See Volume II, Chapter 5B.

to the Act, all that were made during the first five years following its passage, were limited to minor changes in organizational matters, most of which resulted from the passage of the National Security Act of 1947 and 1949.

The first of these, enacted 3 July 1948, rearranged the terms of office of the commissioners and slightly increased their salaries.[34] The second, enacted on 4 March 1949, retroceded certain lands to New Mexico.[35] The third enacted 11 October 1949, gave more specific statutory form to the Military Liaison Committee by providing that it should consist of representatives appointed by the three service secretaries and a chairman, either civilian or military, appointed by the President.[36] Appeals by it against AEC decisions would go to the Secretary of Defense and go from him to the President. The fourth, enacted 23 September 1950, provided that the General Manager of the AEC would be appointed by the Commission rather than the President.[37] There was little or no controversy over any of these measures, nor any extensive discussion.

Discussion of more serious changes in the Atomic Energy Act began during 1950 as the result particularly of the log jam in security clearances of the Q and M types within the military services occasioned by the operational expansion in atomic capability.* The Department of Defense desired two things in particular: (1) classification of atomic energy information (Restricted Data) entering military channels in accordance with military standards of sensitivity and similar treatment for it; (2) access by military personnal to this information in accordance with military standards of security

*See below, Chapter 10.

and without other special clearances. In negotiations which have been detailed previously it was agreed that the matter would be handled by abrogation of the Lilienthal-Forrestal agreement and a reinterpretation of the appropriate sections of the Atomic Energy Act rather than by requesting an emendation of the law.

Another matter about which the military services had become greatly concerned by early 1951 was the prohibition by Section 10 (a) (1) of the Atomic Energy Act of the release of Restricted Data to foreign nations. The Department of Defense wanted specifically to release information to the United Kingdom and Canada following the conclusion of various defensive agreements, including the formation of the North Atlantic Treaty Organization in 1949.

Military expediency therefore seemed to dictate some release of information in these cases, and possibly also for the joint international commands being formed in Europe.[38] After extensive discussion between the AEC and DOD the Congress passed and the President signed on 31 October 1951 an act authorizing the AEC to give non-weapon Restricted Data to a foreign nation after a unanimous vote by the AEC, a favorable recommendation by the National Security Council, and the approval of the President.[39] The Defense Department, however, had already made clear to the AEC that the proposed amendment was too limited to be of any material benefit. At about this time the Secretary of Defense took more positive action in the matter by requesting the JCS on 21 October 1951 to submit recommendations as to a suitable amendment which would permit cooperation with foreign governments on atomic energy matters on broader terms and under less restrictive conditions.

The JCS reply of 20 November delineated three areas in which authorization for the release of information was desired: scientific information, atomic intelligence, and weapons data needed in joint operations. This was approved by the Secretary, a draft of the proposed amendment prepared by the Assistant Secretary, and this sent to the MLC for further coordination; however, no separate amendment resulted. The whole matter was ultimately postponed for inclusion with the more extensive revision of 1954.[40]

Four amendments were passed during 1952, but apparently none of them originated with or particularly concerned the Defense Department. On 5 April 1952, the Congress eliminated the requirement that the Federal Bureau of Investigation conduct a background investigation of all new employees of the Atomic Energy Commission and its contractors, that responsibility being assigned to the Civil Service Commission.[41] The requirement for FBI investigation was retained, however, in the case of positions designated as "sensitive" by the Commission, groups or classes specially designated by the President, and persons on whom derogatory information was developed. This amendment was essentially an answer to the FBI protest at the increasing investigative load which was described as threatening the efficiency of its primary functions. On 17 July 1953 an act was approved authorizing the AEC to enter 25 year contracts for utility services to its Oak Ridge, Paducah, and Portsmouth installations.[42] On 31 July 1953 another amendment made certain specific changes in the Atomic Energy Act, the most important of which was to remove the statutory requirement for any other administrative division than the Military Applications Division within the AEC.[43] Less than a month later, on 13 August, the Commission's specific exception from state and local

taxes was repealed.[44]

It should be noted, however, that a number of other proposed amendments had been and remained under consideration. By May 1951 the number had increased to twelve, on eight of which the Department of Defense had already expressed concurrence. These eight, however, concerned relatively minor matters either clarifying details of the Act or confirming certain interpretations. On four other more important matters negotiation between the AEC and DOD was in progress. These were (1) changed security clearance procedures (Sect. 10 (b) (5) (B) (i); (2) participation in production of fissionable materials outside the United States by American citizens, (Sect. 5 (a) (3) (c); (3) transmittal of Restricted Data to foreign nations (Sect. 10 (a) (1); and (4) export of fissionable materials to foreign nations (Sect. 5 (d). Some of these had been under consideration at least since May 1950. While space does not permit analyzing each phase of the stand taken by the AEC and DOD on these four matters, in general it may be said that the AEC desired to be freed from some of the restrictive language of the original act. In the second and third cases, for instance, it desired to be granted the right to authorize American citizens to participate in the production of fissionable materials outside the United States under certain conditions (as by scientists engaged in research in foreign universities) and to export fissionable material under certain conditions (as in aiding Canada to establish research reactors in return for supplies of uranium ore). The DOD, while conceding the logic of such authorizations, wished each instance to be strictly controlled by the President or his designated agents, rather than the AEC. The DOD, on the other hand, was pressing increasingly for legislative au-

thorization to release necessary Restricted Data on operational weapons to the leaders of allied military forces.[45]

Although all of the above matters remained under consideration during 1951 and 1952, no specific legislation on the above four subjects was approved by the Joint Congressional Committee on Atomic Energy. Late in 1952 it began to give attention to the possibility of recommending legislation to permit the generation of atomic energy for industrial purposes. This would necessarily include either the sale or lending of fissionable material for use in private reactors, which would directly affect the availability of such materials for military use. The subject came strongly to the fore on 10 December 1952, when the Chairman of the National Security Resources Board recommended to the President that the Atomic Energy Commission draft for submission to Congress an amendment to the Atomic Energy Act specifying the conditions under which private interests might be authorized to operate commercially in the field of atomic power research, development, and production. Reviewing this matter, the Joint Chiefs of Staff recommended on 20 February 1953 that the Department of Defense give strong support to a vigorous long-range program for the application of atomic energy to industrial purposes, expressing the view that this could be made compatible with military purposes. While rejecting the idea that a finite limit could be placed, at least for an indeterminate period to come, on the quantity or diversity of atomic weapons, the Joint Chiefs concluded that the industrial utilization of fissionable material could be harmonized with military needs as approximately determined over interim periods.[46] The Department of Defense later supported the concept of licensing private industries to utilize atomic power

in hearings conducted by the Joint Committee during the spring of 1953; however, no bills immediately resulted, apparently because the new national administration and the majority of the Committee favored a broad rewriting of the entire act which would dispose of all pending proposed amendments.

On 17 February 1954 President Eisenhower submitted to Congress a number of recommendations in regard to amending the Act, among which he emphasized "widened cooperation with our allies in certain atomic energy matters," "improved procedures for the control and dissemination of atomic energy information," and "encouragement of broadened participation in the development of peacetime uses of atomic energy in the United States." Shortly afterward the Joint Committee prepared in cooperation two bills, which were introduced into the House and Senate on 15 and 19 April as H.R. 8862 and Senate 3323. These proposed amendment of each of the twenty-one Sections of the Atomic Energy Act.[47]

As a result of the public hearings during May and June a number of changes were made in the proposed acts, and because of these the revised bills were reintroduced as H.R. 9757 and S. 3690 on 30 June 1954. These had been unanimously approved by the Committee, but three statements of reservations as to various aspects were filed, each signed by two or more members.[48] The Department of Defense position was presented on 4 June 1954 by Assistant Secretary of Defense for Research and Development Donald A. Quarles, who was accompanied by representatives of the three services, all of whom were also members of the MLC. Individual presentations by military departments, the Military Liaison Committee, and the Department of Defense had been made also to the Joint Committee in executive

session on 4 May. Secretary Quarles stated that the Department of Defense strongly recommended enactment of the revised bill as "a realistic and constructive approach to atomic energy legislation," subject to minor revisions. These revisions, which he contended would serve to make the bill even better express the objectives set forth in the President's speech of 17 February, were eight in number, but three related only to minor changes in verbage and need not be reviewed here.[49]

The remaining five may be summarized as follows: (1) redefinition of the term "atomic weapon" in Section 11d to exclude the carrying vehicle and auxiliary equipment;* (2) elimination of the term "utilization" from the definition of Restricted Data in Section 11r in order to avoid a possible involvement of operational information within that category and consequent complications; (3) removal of the requirement in Section 123 that proposed agreements for cooperation with other nations be formally submitted to the Joint Committee for approval, so that these would be left for the executive decision of the President; (4) elimination of the authorization in Section 142d that the AEC might remove from Restricted Data classification information primarily concerned with weapons utilization for the use of the Defense Department only, since this would be of little value for the Department in comparison with the broader authorization set forth in (2) above; (5) removal of the requirement in Section 141b that weapons information disclosed to foreign nations be limited to size, weight, and shape only in favor of allowing such information

*The narrower definition was highly important to the Defense Department because it would permit the divulgence of operationally important weapons information to other NATO nations.

[redacted]

on design and fabrication to be disclosed as the President determined to be essential; (6) removal of the requirement in Section 143 that the Secretary of Defense make a special finding that the security procedures and standards of the Department were adequate and in reasonable conformity with those of the AEC. Secretary Quarles also made the following general statement of policy:[50]

> From a strictly military standpoint it should be recognized that the more nearly atomic weapons can be treated as conventional weapons, the more surely can their maximum defense values be achieved. It is in the spirit of this concept that we have approached this proposed legislation, recognizing however that there are still compelling consideration that prevent the full realization of this military objective.

The Defense Department was successful in achieving adoption of only one of these proposed revisions—the first.[51] Nevertheless, the new legislation, entitled the Atomic Energy Act of 1954, represented the attainment of a number of objectives for which the military services had been contending for years. First, in the field of control of atomic information the Defense Department was given joint authority with the AEC in determining whether Restricted Data relating primarily to weapons should be released and the Commission was directed to remove from Restricted Data category all such information which the Commission and Defense Department had jointly determined could be adequately safeguarded under military security standards. The Commission was also authorized to permit any of its employees or contractors to give access to Restricted Data to properly designated Department of Defense personnel, thus removing a longstanding irksome requirement for the "Q" clearance for them under such conditions.[52] Second, the President was authorized to allow the Defense Department to communicate to another nation or regional defense organization Restricted Data necessary for

"(1) the development of defense plans, (2) the training of personnel in the employment of and defense against atomic weapons,* (3) the evaluation of the capabilities of potential enemies in the employment of atomic weapons." The Department was prohibited, however, from releasing Restricted Data "relating to the design or fabrication of atomic weapons except with regard to external characteristics, including size, weight, and shape, yields and effects, and systems employed in the delivery or use thereof."[53] In addition to Presidential approval that of the Joint Committee was also required in this case.

Undoubtedly the most important provision of the new act, however, was non-military in nature--the establishment of a system under which licenses might be issued by the Commission for commercial applications of atomic energy, following a finding by it that the application in question was of practical value. This included the right to distribute "special nuclear material" to licensees for use at a reasonable charge, the material itself remaining the property of the United States.[54] In referring to these provisions, Assistant Secretary Quarles had stated for the Defense Department that they represented an objective "which we strongly support but whose implementation falls more properly within the jurisdiction of the AEC."[55] It may be noted further that the Commission, subject to the approval of the President and Joint Committee, was authorized to participate in international arrangements on atomic energy and the President was specifically authorized to enter into an International Atomic Pool for peacetime applications of atomic energy.[56]

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*The Act did not authorize the transfer of atomic weapons to a foreign nation, however. Although the weapons might conceivably be used by a joint force, foreign personnel would not be allowed access to the interior of the weapons and they would have to remain in the custody of U. S. military personnel.

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SECTION II: OPERATIONAL EXPANSION

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Chapter IV

EXPANSION OF THE STRATEGIC ATOMIC STRIKING FORCE

Strategic Requirements and Expansion

In early 1949 the Strategic Air Command's expansion was still proceeding under the original concept, stated in early 1946, of maintaining a separate and distinct atomic striking force, although this was not to be identified as such within the budget. The Joint Chiefs of Staff had stated a minimum numerical requirement in early 1948 for this force in terms of aircraft, crews, and assembly teams, based on the estimated stockpile and desirability of delivering it within

Basically, the requirement was for 225 modified aircraft by 1 January 1949 and 400 by 1 January 1953. At the earlier date the Air Force had not been able to come close to meeting the first requirement despite the pressure put behind the GEM Program, since it had only 124 modified aircraft, 21 tankers, and 90 trained atomic crews. It expected, however, to exceed the 1 January 1950 requirement for 270 modified aircraft well before that date, as well as the requirement of 220 crews by that date. In February 1949, Col. M. F. Summerfelt of AFOAT estimated that the Air Force would have 303 modified aircraft by 1 January 1950 and 464 by 1 January 1951, forecasting intercontinental raids of bombs per mission. by the latter date (delivered by atomic carriers and diversionary aircraft).[1]

Organizational plans in early 1949 called for an atomic striking

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*See Volume II, Chapter 6D.

[redacted]

force of 6 medium bomber and 4 heavy bomber wings, plus 2 strategic support squadrons. These were to be maintained at 50 per cent overstrength in aircraft and 100 per cent overstrength in crews. In April 1949 the Air Force reported to the MLC that the atomic striking force now consisted of 4 understrength wings, all under the Eighth Air Force, as follows:

509th	(MB)	48 B-29's	43 crews
43rd	(MB)	32 B-50's	35 crews
2nd	(MB)	33 B-50's	17 crews
7th	(HB)	25 B-36's	21 crews

Forty tankers were now available to support these, with 124 scheduled by 1 January 1950. Three other medium bomb wings, (the 93rd, 97th, and 301st) were partially equipped, but were not considered fully trained. To these were assigned 29 B-29's and 41 crews. Full capability of the four wings reported as operational was not expected to be achieved until 1 July 1949, and the date of full capability for the entire ten wings of the atomic striking force remained highly indefinite.[2]

In October 1949, the Air Force reported to the MLC that the number of modified planes had risen to 195, consisting of 27 B-36's, 65 B-50's, and 103 B-29's, distributed among 9 wings, of which 3 were heavy and 6 medium.* Also available were 224 fully trained atomic crews and 56 partially trained. Apparently, however, most of the wings were only partially operational.[3]

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*These were the 7th, 11th, and 28th Heavy, and the 2nd, 43rd, 93rd, 97th, 301st, and 509th medium. The 11th Heavy had only 5 modified aircraft, and the 28th only 1.

[redacted]

By January 1950 the number of modified planes and trained crews had risen to 225 and 263 respectively. The bombers consisted of 95 B-29's, 96 B-50's, and 34 B-36's, and these were supported by 78 tankers.[4] In general the SAC program at this time called for 10 medium bomb wings, 4 heavy bomb wings, and 3 reconnaissance wings through fiscal 1953.[5] By the end of fiscal 1950 the Air Force reported 6 medium and 1 heavy bombardment atomic wing fully trained and equipped, and altogether there were said to be 264 modified aircraft available. The planned minimum striking force was now scheduled to consist of 9 medium and 4 heavy wings, equipped with B-36's, B-47's, and B-50's, 2 strategic support squadrons of C-97's; 3 strategic reconnaissance groups; and 2 fighter wings. The number of assembly teams available had increased from 11 to 22 during the year, with 10 assigned to SAC bases for forward inspection and the other 12 assigned to stockpile sites for rear assembly.[6]

During the remainder of 1950 and the first half of 1951 the expansion of the strategic atomic striking force continued quite slowly, only one medium bomb wing being added. On 1 May 1951 the force was reported to consist of 282 operational medium and heavy bombers, organized into 7 medium and 2 heavy bomb wings.* The principal factor in the slower build-up appears to have been delays in the delivery of the B-47. Meanwhile, under the enlarged Air Force now planned, the strategic atomic striking force had been reprogrammed to achieve by 1 July 1952 a strength of 11 medium bomb wings equipped with B-29's, B-50's, and B-47's; 4 heavy bomb wings equipped with B-36's; 3 strategic

*On 25 April 1951 Lt. Gen. Curtis E. LeMay, Commanding General, SAC, had reported to Gen. Hoyt S. Vandenberg, Chief of Staff, USAF, the same as in January. (Ltr., CS SAC to Atg DCS/O, Hq USAF, sub: Increase in SAC Atomic Delivery Capability, 1948-1954, 18 Aug 1958, Enclosure 1.)

[redacted]

support squadrons equipped with C-124 [redacted] strategic reconnaissance wings; and 7 fighter wings (escort).[7] Use of the fighter escort force for atomic weapons delivery does not appear to have been at this time under consideration, although a unit of F-84's and B-45's was being organized within the Tactical Air Command for delivery of atomic weapons.[8] More attention appears to have been given at this time to the conversion and retrofit of aircraft to carry the MARK 5 and 6 bombs as well as the MARK 4 than to a rapid increase in the number of atomic bombers. The striking power of the SAC was expected to be doubled or tripled during 1951 through this process and through the conversion of the stockpile to improved

Two heavy bomber wings, one light bomber wing, and one augmented fighter bomber wing were added during FY 1952, raising the strength of the atomic striking force to four heavy bomber wings, seven medium bomber wings, and one augmented fighter bomber wing.* These were equipped with 447 heavy, medium, and light bombers (B-29, B-36, B-50, and B-45 types) and 104 fighter bombers (F-84 types). To support atomic delivery forces 32 assembly units of various types had been trained, while 13 other units were undergoing training. Assembly units at national stockpile sites were said to have a capability of assembling] while Air Force units operating field storage sites overseas were said to have a capability of maintaining

were deployed overseas, while one was in training at Sandia Base. each capable of

were ready for deployment.

ad been trained and deployed overseas.[10]

*The light bomber and fighter bomber wings were under USAFE rather than SAC, but were included at this time in enumerations of the over-all force.

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For the following year, fiscal 1953, the strategic atomic striking force was programmed to increase to six heavy bomber wings equipped with B-36's; ten medium bomber wings equipped with B-47's; B-50's, and B-29's; and five strategic fighter groups equipped with F-84F's and G's. The force would also be supported by four strategic support squadrons equipped with C-124's.[11] The above figures, however, were not attained, since in September 1953 the strategic atomic striking force for the emergency war plan was reported to consist of approximately 545 bombers organized into two B-47, six B-50, one B-29, and four B-36 combat ready wings and two partially combat ready B-36 wings.[12]

This, of course, did not include the atomic-capable strategic fighter units, which numbered about five partially capable wings at this time. The strategic fighter atomic capability increased rapidly in late 1953. On 10 September the SAC was reported to have 29 strategic fighters, all F-84G's, capable of delivering the Mark 7 weapon by VAR or LABS bombing techniques, together with 10 qualified crews. By October the number had risen to 53 aircraft and 28 crews.[13]

With respect to atomic capable medium and heavy bombers, specific figures are available for the beginning, middle, and end of the fiscal year 1954, as well as for combat ready bomber crews. These were stated as follows:[14]

[redacted]

	1 July 1953	31 Dec 1953	[redacted] 30 June 1954
B-36	108	149	151
B-47	206	317	405 (9 wings)
B-50	205	137	90 (2 wings)
B-29	220	108	135 (3 wings)
Totals	739	711	681
Crews	398	494	666

On 1 August 1954, shortly after the end of the fiscal year 1954, the strategic capability was reported to consist of 6 heavy bomber wings, 4 heavy reconnaissance wings, 17 medium bomber wings, and 6 strategic fighter wings. The characteristics of these were as follows:

Wings	A/C Types	Assigned	Op. Ready	Crews	Op. Ready	An. Op. Cost
6 HB	B-36	173	148	199	148	$399.5 m.
4 SR	RB-36	114	69			270.6
15 MB	B-47	690	432			966.0
2 MB	B-50	90				
6 SF	F-84F&G	374		530	NA	193.1

All of the 6 heavy bomber wings had delivery capability for the Mark 5 and 6 bombs, and 4 also possessed a limited capability with the Mark 8 and 18. In addition 41 aircraft assigned to 5 wings had an emergency capability with the TX-14, TX-17, and TX-24 thermonuclear bombs. The 4 heavy strategic reconnaissance wings had a delivery capability with the Mark 6 bomb. In the case of the medium bomber

*Some discrepancy exists between these figures, obtained directly from the SAC and figures given below for a shortly subsequent date, assembled by the Directorate of Management Analysis, Headquarters, USAF.

[redacted]

[redacted]

[redacted] wings, 16 had a capability with the Mark 5 and 6, 2 with the Mark 8 and 11, and 8 with the Mark 18. The 6 strategic fighter wings had partial capability with the Mark 7.[15]

SAC Atomic Weapons Carriers

The aircraft used for the carriage of atomic weapons by the SAC from 1948 through 1953 consisted of the B-29, B-50, B-36, B-47, and F-84G.* Since there were only a small number of B-45's and these were primarily intended for reconnaissance use, they may be disregarded. During 1953 SAC was in process of developing a considerable atomic capability with its strategic fighters, but this was only partially attained at the end of that year. Almost the entire SAC atomic operational capability rested until 1951 in its medium bomber force, composed of B-29's and B-50's. This meant dependence on foreign bases and air refueling for its emergency war plan commitments. Although the B-36 provided some intercontinental capability after 1951, the bulk of the atomic striking force remained the medium bombers, which began to include increasing numbers of B-47's. Although the B-50 and B-36 were introduced in SAC in 1948, the mainstay of the SAC atomic striking force until 1952, when the B-47 became operational in quantity, was the B-29.[16]

For the design and modification of atomic weapons carriers the reader is referred to other sections of this history. Performance factors of the existing and programmed types of operational atomic carriers were stated in early 1949 as follows:

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*See Volume II, Chapter 11 and 12, and Volume V.

[redacted]

[redacted]

	Combat Radius (NM)	Cruising Speed (K)	Combat Speed (K)
B-29A	1800	216	315
B-29B	2150	211	326
B-50A	2210	238	352
B-50B	2350	246	350
B-36B	3680	201	315
B-36C	3220	198	360

At the end of 1948 the SAC included eleven B-29 wings, one B-50 wing, and one B-36 wing, but there was full atomic operational capability only in one wing of B-29's, the 509th. However, modified aircraft, including B-50's and B-36's were beginning to reach the SAC in some quantity, 124 being reported on hand on 1 January 1949, of which 65 were B-29's, 42 B-50's, and 17 B-36's.*[17]

Ultimately, by the end of 1953, ten additional B-29 wings were activated; however, several of the eleven functioning at the beginning of 1949 were meantime in process of conversion to B-50, B-56, and B-47 wings. Of these reactivated B-29's, 180 were modified for the carriage of atomic weapons by September 1953, when the phase-out of atomic-bomb-capable B-29's began. By the end of 1954 all B-29's had been phased out of the SAC atomic striking force.[18]

The B-50, as explained elsewhere, was an improved version of the B-29 intended as an interim replacement for and supplement to it. However, its performance was not sufficiently advanced over the B-29B to justify its production in quantity as a complete or longer term replacement. The expected early appearance of the B-47, which first flew in late 1947, and the planned use of range extension procedures and overseas staging bases brought about the designation of that aircraft for this role. For longer range missions, particularly of the

*See Volume II, Chapter 6D.

intercontinental type, it was also planned to produce a limited number of B-36's.* [redacted]

Except for a few planes earmarked for reconnaissance, nearly all of the approximately 230 B-50's ultimately to be assigned to the SAC were modified aircraft intended for the atomic striking force. To the one wing existing in January 1949 were to be added (by conversion from B-29's) four more. These five B-50 wings comprised a solid bulwark of strength for the atomic striking force down to the end of 1953, when their conversion to B-47's began. The last two B-50 wings were converted early in 1955.[19]

As seen in Volume II, the B-47 was one of two early postwar multi-jet bombers which reached the production stage as possible replacements for the B-26. Both it and the B-45 were designed to carry the atomic bomb, but the B-45 was unable to carry the Mark 4 or 6, the result of an excess of secrecy by Manhattan District.** The X model of the B-47 flew in December 1947; however, its radical design, including swept-back wings, underslung engine nacelles, and bicycle landing gear lead to a forecast of a long developmental period. Nevertheless, its high performance and growth potential as compared to rival designs resulted in a decision by the Air Force in late 1948 to place a first order for about sixty of the aircraft.[20]

Although the SAC had apparently not participated to any great extent in the early planning for the development of the B-47, by 1949 it was displaying great interest in the aircraft as a possible replacement for the B-29 and B-50. Several factors appeared to

*See Volume II, Chapter 12A and B.

**See Volume II, Chapter 12B.

[redacted]

influence this attitude. The B-36A had proved disappointing, particularly with respect to speed, while the XB-49, the jet version of the flying wing, seemed of doubtful utility for operational purposes.* The entire B-52 program had been reoriented along new lines; and it seemed likely the B-47 would be the only high performance bomber available for a long time to come, especially since the B-54 (improved B-50) and B-55 designs had been discontinued. Although the range of the early B-47 (estimated at 1400 miles) was marginal for many purposes, this was subject to growth with improved engines. Meantime the refueling systems currently under development and the proposed network of overseas bases could greatly extend its range and operational usefulness.

Having been notified by Headquarters, USAF, in September 1949 that it would receive 108 B-47's during 1950 and 1951, the SAC proceeded to plan for the conversion of two B-29 wings by January 1952. This proved impossible to carry out, since the first B-47's reached the SAC nearly a year late, in October 1951. B-47's had begun to leave the production line in June 1950, but numerous deficiencies had been found, and an Air Force Board recommended modifications before delivery to SAC. To avoid undue delay it was agreed that SAC would accept the first 90 articles without extensive modification and that those would later be returned for modification after planes were delivered with production line modifications.[21] Pending the arrival of planes modified to achieve operational suitability, these would be used for training. Meanwhile, the number of aircraft on order was increased to 400, and SAC revised its programming plan late in 1951 to provide for at least 11 wings instead

*See Volume II, Chapter 12.

of four. Actually, the SAC received only 32 B-47's by October 1952, of which only 8 were modified and considered combat capable.

Conversion was in full swing during 1953, at the end of which 10 B-47 wings were among the 21 medium bomber wings in being, though only 3 were combat ready. At that time, the SAC had 281 B-47 aircraft and 394 crews, of which 264 and 136 respectively were reported combat equipped or combat ready. At the end of 1954 the B-47 force had risen to 22 wings, out of 24 in the medium bomber force of which 15 were combat ready. The inventory then totalled 889 aircraft.[22] Each B-47 wing contained 45 B-47's and 20 KC-97 tankers.

Although the medium bomber force remained the backbone of the SAC for the period under discussion, the airplane which best accorded with the long-term Air Force strategic concept of intercontinental bombing was the B-36.* This aircraft represented the only real intercontinental capability for the command during the period, since the B-29, B-50 and B-47 depended on carefully coordinated systems of refueling and overseas bases. Since throughout the period the national government pursued the policy of holding nuclear components in this country prior to the outbreak of war and since the overseas bases were considered quite vulnerable to enemy action, the B-36 force was considered to constitute a necessary and valuable backup.. In the public mind it even came to typify the SAC.

The B-36A and even the B-36B failed to closely approach the requirements which had been stated in 1941. As seen in Volume II the SAC remained doubtful about the utility of the aircraft until at

*For a full discussion of this concept see USAF Historical Study No. 89: The Development of Air Doctrine in the Army Air Arm, 1917-1941, Chapter 3.

[redacted]

least 1948, when the exigencies of the time dictated its acceptance despite its deficiencies.* Eighteen of the B-36's were among those modified for atomic delivery under the early GEM Program, and a few of these were received by the SAC in late 1948.

By 1 August 1949 contracts had been let or procurement directed for 170 items, and it was planned to procure 79 more from FY 1950 and 1951 funds. Fifty-two aircraft had been delivered, including 22 B-36A's and 30 B-36B's. Delivery was expected to be completed during fiscal 1952. It was planned to use the above aircraft to equip 4 heavy bombardment and 2 strategic reconnaissance groups, each comprising 30 aircraft. The remaining 69 were to be used for attrition and replacement. This represented a considerable increase over the earlier program. A favorable factor had appeared in that it had been found possible to add as a retrofit four supplementary jet engines arranged in two pods to the aircraft, greatly enhancing its top combat speed.[23]

The above program was fairly closely adhered to, except that the two strategic reconnaissance wings were also made heavy bombardment. The first two wings became operationally ready in 1951, a third in 1952, and a fourth in 1953. At the end of October 1953 the SAC had 136 combat equipped B-36's of a total of 180 in inventory; 177 crews were available, of which 118 were combat ready. One other wing became operationally ready in 1954, while a sixth was considered capable of an EWP mission. During the same year the Featherweight Program was carried out, and this with certain other modifications gave greater range and altitude. SAC received its final B-36 in August 1954,

*See Volume II, Chapter 12A.

[redacted]

[redacted]

bringing the command inventory to 209.[24] However, phaseout of the B-36 did not begin till 1956.

It can readily be observed that none of the above bombers satisfied SAC requirements for a suitable delivery vehicle for the atomic bomb. Beginning in early 1950 the SAC gave increasing attention to the longer term problem of the development of an atomic bomb carrier of much greater effectiveness. It was admitted that the B-36 would become obsolescent after 1951 along with the B-50. Meanwhile, the B-47, while remaining operationally effective, would be reaching the limits of its growth, and the foreign bases on which it was dependent would become increasingly vulnerable to attack.

Two principal possibilities appeared--one was to anticipate the successful development and use of one or more of the ground-to-ground missiles under development; the other was to press for the rapid development and production of the B-52; the multi-jet long range bomber which had been under development since 1948. A compromise proposal was to extend the life of the B-36 by adapting it for the carriage of the Rascal air-to-ground missile. Supplied with detailed information by the Air Materiel Command in February 1950 on the status of all these programs, the SAC had reached rather definite conclusions within a short time which it consistently adhered to. These views, set forth several times during the year in statements both to Headquarters, USAF, and before the Board of Senior Officers, were approved in substance by them.

The SAC concluded from the analyses of the guided missiles program submitted by the AMC that operational guided missiles would not be available soon enough to replace the heavy and medium bombardment forces of the command at the end of their normal spans of

[redacted]

life.* Accordingly, the SAC recommended that various expedients be employed to extend the lives or enhance the usefulness of the B-36 and B-47. The B-36 would be given greater range by adding floating wing tips and greater speed by the improved turbo-jet (4360-57) or a turbo-prop engine. Since the B-47 was already programmed for an operational life to 1958 and its speed was already near the limitations imposed by its subsonic design, it was considered impracticable to extend its life. However, it was recommended that floating wing tips be applied to extend its radius and that a turbo-prop engine also be considered. The SAC concluded that no practical means existed to extend the life of the B-50 (and, of course, the B-29) beyond 1955.[25]

The SAC saw as its principal need down to 1960 in terms of weapons vehicles as a bomber/reconnaissance aircraft with a speed of 500 knots and combat radius of 4,000 nautical miles. It estimated that such an aircraft, based in North America, could strike 97 per cent of the targets listed in the current emergency war plan in round trip flights. The SAC supported the continued development of the B-52 as the aircraft which could most nearly satisfy its requirements, since that project called for specifications of 492 knots combat speed at 48,000 feet and for 3800 nautical miles

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*These forces included at the time the B-36, B-50, and B-29; the B-47 was also programmed to become operational in 1951. At this time the SAC was programmed for a build-up to 10 medium bomber, 4 heavy bomber, and 3 reconnaissance wings through 1953.

[redacted]

radius (with floating wing tips).* It proposed that the B-52 be used to replace both the B-36 and B-50 after 1954. [redacted]

The SAC reaffirmed its viewpoint with little change in September 1950 to Headquarters emphasizing the non-availability of any other new weapons vehicle either aircraft or missile prior to 1955 and pointing out the increasing need for intercontinental capability to replace the vulnerable overseas bases, now open to Russian atomic weapons.[26] In meetings in late 1950 the Board of Senior Officers recommended immediate letting of contracts for production of the B-52 as soon as possible at the rate of 4 per month. This was approved by the Chief of Staff and Secretary of the Air Force in January 1951, and contracts were let for 13 B-52A's and ancillary items in February.[27]

The SAC continued to push for rapid development and production of the B-52, and was strongly supported by Headquarters USAF. By August 1953 the Director of Operations, Headquarters USAF, was ready

*At the same time the SAC rejected the long range turbo-prop plane advocated as the optimum solution in RAND Project R-1735. The SAC pointed out the limited nature of the report, such as its failure to consider the carriage of a proposed fusion bomb, floating wing tips, and the intercept course computer. Disagreement with RAND was also expressed on numerous points, such as the required speed (too low), the assumed defenses (described as guided missiles only), the assumption that SAC would employ a homogeneous force, the limited size of the plane (which would not permit carriage of guided missiles), the contention that high speed and altitude would significantly reduce CEP, the conflict with a general development trend toward high performance guided missiles, the late availability (which might be 1959), and the failure to challenge the Russian defense force by high performance. (Ltr, CG SAC to Chm. Senior Officers Board, sub: RAND Project Report No. R-1735, 2 May 1950, in Summary Minutes of Seventh Mtg., BOS, Sect. V. A swept wing B-36, a turbo-prop B-47, and proposals by Republic and Douglas were also rejected.

[redacted]

to state an operational concept, al[redacted] was informational rather than directive. It was now planned to use the B-52 solely as a replacement for the B-36. The first production B-52 was expected in July 1954, the first wing would become operational in late 1955 or early 1956, and all B-36's would be replaced by B-52's by late 1959, the production rate being 6 per month. The requirement for an RB-52 would be satisfied by a reconnaissance capsule in the bomb bay, requiring 20 man hours, the 7 wings would include 33 aircraft each (268 including spares) and about 8 overseas staging bases would be required. The aircraft would not be flown in close formation, but utilize the cell concept, and would be capable of 3 sorties per month. In general, the B-47 and B-36 bases would accommodate the aircraft.[28]

The Strategic Air Command began to give serious consideration to the USAF guided missile program, which had been left almost entirely in the hands of the Air Materiel Command, in 1951. The SAC showed particular interest in three of the missile projects under way—Rascal-Shrike (MX-776), Snark (MX-775), and Navaho (MX-770). The report received from the AMC in early 1950, prior to the SAC's statement of requirement for strategic air vehicles, had not been encouraging, but greater activity developed during 1951 due to some promising test results, a greater flow of development funds, and a reorganization in the research and development area.

During 1951 the SAC also developed a guided missiles philosophy and policy which was to remain firm for several years to come. First, the SAC stated its desire "to get into the guided missiles business" and bring guided missiles into the war plan, both at the earliest possible date. Second, both of these objectives were

[redacted]

[redacted]

were to be accomplished without sacrifice of combat capability, since the responsibility of the SAC in maintaining the nation's atomic warfare deterrent capability must be kept foremost. Consequently, the attitude of the Command was both interested and conservative.

The Rascal project had been established as a bridge between the piloted strategic bombardment system and a completely pilotless strategic bombardment system. It was expected to provide the earliest capability and would presumably supply greater effectiveness in delivery and reduced attrition for aircraft such as the B-36 by enabling the director plane to remain outside the heavily defended area immediately around the target. By August 1951 Headquarters, USAF, was planning for the activation of two squadrons of Rascal carriers in 1953, one of B-36's and one of B-50D's. A missile stockpile of 200 items, considered sufficient for 3 months of operations at a sortie rate of 3 per month for the B-50 and 2 for the B-36, was contemplated. The B-50's were to be modified first, beginning in June 1952. The B-50's were to operate from overseas bases, the B-36's from the Zone of Interior with post-strike staging overseas. The Rascal, which was to be designated shortly the B-63, was to carry the XW-5.*[29]

Some planning, but less detailed, had also taken place with regard to the Snark, which was to be designated the B-62. Two squadrons had been programmed for with a stockpile of 60 missiles. These would be deployed from the Limestone Air Base area. Planning for use of the Navaho was more indefinite, although it was considered a later

*Channels were not set up to permit the flow of design information between the services and the AEC regarding the atomic warhead until March 1950. The Air Council determined that guided missiles should bear aircraft designations in September, 1951.

[redacted]

[redacted]

replacement for the Snark.

The SAC remained somewhat lukewarm toward all the above projects, particularly the Rascal, although not opposing it outright. The command expressed doubt as to the utility of the Rascal in terms of the operational penalty in using it, holding that if an air-to-surface missile were used it should be of much greater range, preferably at least 1600 nautical miles. The SAC also wished to limit the program to a few B-50's or, even better, B-29's until the system was proved, holding that the small number of B-36's should be husbanded for operational use. The SAC was much more favorably disposed toward the Snark than the Rascal, stating that the former would create an additional capability rather than giving limited improvement to an existing one.[30]

In late 1952 this attitude of the SAC became even more pronounced. Reporting in August that it was engaged in developing operational concepts for strategic missiles, the SAC recommended near deletion of the Rascal program, continuation of the Snark as a step toward better missiles, and acceleration of the Navaho and Atlas programs. It stated that the Rascal system presented "operational problems so severe as to make its utility open to serious question" and that in addition performance penalties imposed upon director aircraft limited employment to a relatively small percentage of targets. Concluding that the cost of modifying aircraft did not appear to be justified by the operational gains, the SAC recommended a severe reduction of the program so as to eliminate all B-36 and B-47 aircraft.[31]

The SAC urged that any production of near-term missiles be governed with the end of expediting long range high speed carriers such

[redacted]

as Navaho and Atlas. In this light the SAC found Snark, unlike Rascal, to be a logical step in the production of high performance, long range missiles. It also found Snark to offer some promise as an operational system and not so severely limited as Rascal as to percentage of suitable targets.[32]

Despite the above recommendations, the Rascal program remained in effect with little change, including use of both the B-36 and B-47 as carriers and director aircraft. Even the B-52 was now being considered as a director carrier. Intensive work began in late 1952, involving cooperation among the SAC, Special Weapons Command, Wright Air Development Center, Sandia Corporation, and the AFSWP, on the development of atomic warheads for the Rascal and Snark, including suitable adaption equipment and fuzing and firing systems. This development activity was still underway at the end of 1953.[33]

Much more important than guided missiles in enhancing the atomic delivery capability of the SAC were the strategic fighter wings, all of which were developing such capability late in 1953. Under the 70 group Air Force program effective in 1948, the SAC was allotted two fighter escort wings, and these were assigned to the Command in November of that year. The 95 wing program which was instituted following the outbreak of the Korean War brought an increase from 2 wings in October 1950 to 7 by October 1951, but this fell to 3 by the end of the year due to demands from FEAF. Under the 143 wing program inaugurated in June 1952, the SAC was immediately assigned 4 strategic fighter wings and scheduled ultimately to reach 10 such wings. This was cut back to 9 in the 120 wing reduced program adopted in 1953, but was raised again to 10 under the 137 wing program. At the end of 1953, the SAC had attained a strength of 6 wings.[34]

On 29 January 1952 the SAC requested of Headquarters, USAF, that all its fighters be modified for the carriage of atomic weapons. This was accepted in principle, after evaluation by the Aircraft and Weapons Board, by the Air Force Council, which stated that henceforth fighters of the strategic air force should be considered primarily as strategic strike aircraft rather than fighter escort.[35] Since F-84G's (incorporating refueling provisions and an improved engine) were necessary to make the modification tactically useful, reequipment with these aircraft required some time. The SAC, of course, benefitted from the development programs associated with the Project to equip, train, and deploy the 49th Air Division. The SAC's own Programming Plan 19-52 was ready in October 1952, and all fighter escort wings were redesignated strategic fighter wings in December 1952.[36]

Under the program plan each wing was to maintain an atomic delivery capability in 75 aircraft and a delivery capability of

was to be assigned for each 2 wings, and the first was assigned in March 1953. At the end of 1953 all 6 wings were in process of developing an atomic weapons delivery capability. Four had been assigned a place in the Emergency War Plan under *

and were partially qualified. Like those trained by the Tactical Air Command, the fighter wings of the SAC adopted the LABS techniques and equipment in addition to VAR. By October 1953 SAC planners believed that all listed in SAC OP 50-53 for Eighth Air Force fighters could be hit by strategic fighters

*See below, this chapter.

[redacted]

using Mark 7 bombs; however, no bombs were specifically allocated for this use. Presumably they would have to be obtained after the beginning of war from bombs earmarked for theater commanders or from the JCS reserve. In this sense, the SAC atomic capability with its fighters was limited.[37]

Organizational Control and Deployment

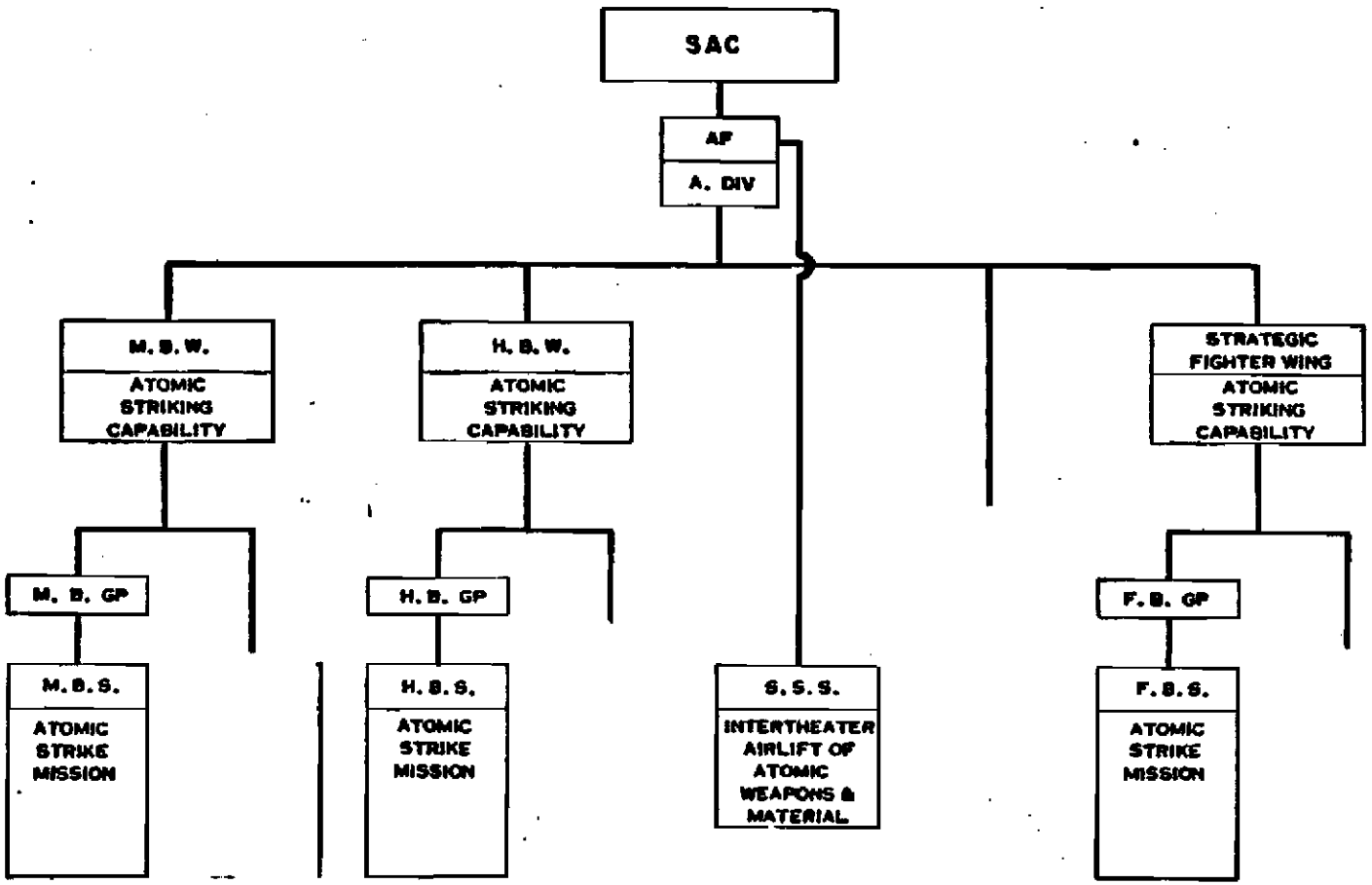
The first major sub-unit of the SAC containing an atomic capability was the 58th Bombardment Wing, which was assigned to the command on 13 June 1946. It included three active groups, of which only one, the 509th, had atomic capability. The 58th Bombardment Wing, which constituted a part of the SAC Fighter Air Force, was deactivated after its three active groups were transferred to the newly reactivated Eighth Air Force in November 1946. The earliest atomic build-up was concentrated within the Eighth Air Force, but ultimately extended also to the SAC's other operational air forces--the Fifteenth and Second.*

As an air command with world-wide operational capability, the SAC was soon forced to adopt other organizational expedients than the numbered air forces which it controlled. In March 1951 the Seventh Air Division was established with headquarters in the [redacted] for control of the base facilities in that country. Its mission was the pre-strike support of fighter, medium bombardment, and reconnaissance wings that would move into the [redacted] of heavy bombardment (B-36) and medium bombardment (B-47) wings.

*See Volume II, Chapter 6B.

[redacted]

NOMINAL SAC ATOMIC AIR FORCE



[redacted]

The wings were to be accompanied by additional support personnel and equipment for absorption within the Seventh Air Division. Command of the Division would pass at that time to the Eighth Air Force.[38] Although two other such commands were established, the Fifth Air Division [redacted] and the Third Air Division [redacted] these did not become functional until early 1954.*

The assignment by the SAC by the JCS of a retardation function in 1951, together with the acquisition by the United States Air Forces in Europe of an atomic capability of tactical air nature, further complicated the matter of atomic warfare control and led to the establishment by the SAC of a number of so-called [redacted] which functioned directly under Headquarters, SAC, as a means of coordinating the delivery of atomic weapons for tactical air purposes, including retardation. Under an agreement concluded between General LeMay and General Gruenther in May 1952, the first of these [redacted]. Under the arrangement agreement General Norstad, Air Deputy to SACEUR, would act as the channel of communication, excluding foreign nationals from access to Restricted Data.

[redacted] as explained in

*By the end of 1953 the Seventh Air Division was charged under the emergency war plan with supporting 8 medium bombardment wings, 2 medium reconnaissance wings, 6 fighter wings, 13 tanker squadrons, 2 special rescue flights, and 135 heavy bombers.

[redacted]

Chapter 8, Coordination Centers were also established in Europe and the Far East by General LeMay, as agent for the Chief of Staff, USAF, and the JCS, to monitor the course of atomic operations and to channel information to the Joint War Room in the Pentagon.

The strategic deployment of the atomic striking force was closely geared to the emergency war plan through the established policy of holding the bulk of the force in the United States until the outbreak of war. Any large scale realistic deployment was severely restricted down to the first part of 1949 by various factors, including the small number of modified aircraft and trained crews available, the small number and capacity of trained assembly teams, the complex nature of available atomic bombs, the location of operational storage sites, and limitations in the characteristics and number of transport planes. Although certain units of the SAC had been deployed to Britain and Germany during the international crisis of 1948, these had no atomic delivery capability. The first SAC emergency war plan, No. 1-49, was drawn up and approved by Headquarters, USAF, during the first part of 1949. It represented the atomic weapons supplement to JCS plan TROJAN, and was prepared by the SAC in compliance with a JCS directive issued under the Unified Command Plan.[40]

Not exclusively atomic in nature, SAC EWP 1-49 provided for the deployment of SAC forces to the and Alaska and for coordinated attacks employing atomic weapons, supplemented by conventional bombs. It included operations by the Eighth Air Force, Fifteenth Air Force, 311th Air Division, and 3rd Air Division, supported by the Military Air Transport Service, Continental Air Command, Air Materiel Command, and Armed Forces Special Weapons Project. The initial phase was to consist of the delivery of

[redacted]

listed in JCS 1974.

Deployment was to begin on E Day plus one from the Zone of Interior, and all medium bombardment units were to be in place by

Heavy bombers were to stage through Alaska.[41]

During late 1949 and early 1950 the situation changed somewhat in that three medium bombardment groups with some atomic capability

in the event of war it was planned to reenforce these with three additional groups by E Day plus six and deliver an initial strike against Russia of bombs. The situation began to change rapidly in regard to both existing storage and future planning following the outbreak of the Korean War in late June 1950.

*Some construction to support assembly and storage had already been accomplished at two of these points under a previous agreement. See below, Chapter 12C.

[redacted]

[redacted]

During the period 1949-1953 a succession of programs were carried out to permit the SAC to reserve its principal atomic forces in the United States and yet be able to effect a rapid operational deployment in the event of war. As seen in Volume II a mobility plan had been begun during 1948 under which each aircraft was provided with packaged essential supplies which would enable it to move rapidly to its war station and operate for a period of up to a month. Obviously, however, certain items could not be fitted into this program, and presumably these would be supplied by the or other of our allies at the pre-strike bases.

Later, as the system of overseas bases began a more extensive

[redacted]

growth, beginning in 1950, a program designated Evening Star (later Seaweed) was effectuated to prestock the overseas bases with logistic items

Beginning in 1954, despite the construction of the new base systems, a trend set in toward less reliance on overseas bases and a greater intercontinental capability. Factors influencing this were the increased Russian air striking capability with nuclear weapons, the anticipated appearance of the intermediate range guided missile, and the anticipated operational use of the B-52. In accord with this trend the SAC developed the FULL HOUSE concept,

Under this concept even the B-47 units would fly missions non-stop from the United States or effect pre-strike staging at The concept was presented to the Air Council in April 1954 and began to be reflected in SAC operational plans in May 1954. Reflecting great advances in

*Actually a program known as Project SKINCOAT, to pre-stock bases for SAC operations, had been begun in 1948. See History of Headquarters USAF for FY 1950, p. 68.

[redacted] the refueling program as well as increased range in the B-47, it would greatly accelerate the initial strike under the emergency war plan.[46]

The Retardation Mission

The mission of attacking targets specifically for the effect of retarding Soviet military advances in Western Europe was apparently first stated as a SAC objective in the Joint Outline Emergency War Plan OFFTACKLE, which was approved as JCS 1844/46 on 24 January 1950. However, the SAC Emergency War Plan 1-49, which was approved two days later, was based on an earlier plan TROJAN (JCS 1844/32) and on the target list approved in JCS 1974, which included no retardation targets. SAC was also directed in JCS 1844/55, the implementing directive to OFFTACKLE, to coordinate with other JCS commanders, [redacted] on procedures and plans for employing SAC forces in their support against the contingency of their requests and JCS approval.[47]

Although SAC immediately included the retardation mission in Europe in its new proposed EMP 1-50, the new mission did not affect the target system, since the JCS had failed to approve a revised system to replace 2056 and including the broader objectives of the atomic offensive. This was not done until JCS 2056/218 was approved 1 July 1953. SAC EMP 1-50 was never approved, but EMP 1-51, which was approved by JCS 2056/27 on 22 October 1951 was similar in that it mentioned the retardation mission while failing to designate specific targets. The JCS did, however, direct that the Air Force designate a minimum one medium bomb wing for retardation and stated that they would also direct the proportion of bombs to be employed

[redacted]

[redacted] for strategic and retardation purposes. This was done to meet Army and Navy objections to the failure to earmark units specifically for retardation.

Retardation planning reached a much more concrete stage in January 1952, when Gen. Dwight D. Eisenhower, SACEUR, was notified that he could plan on the basis of [redacted] use in the defense of Western Eurasia. The bombs would remain in the possession of other commands while

These would be delivered by SAC, by a new USAF tactical air force to be deployed to Europe, and by Navy carrier-based aircraft.[48]

Lt. Gen. Curtis E. LeMay, the SAC commander, had already reached agreement with General Eisenhower and his air deputy Lt. Gen. Lauris Norstad on 6 December 1951 on the nature of the SAC-SHAPE relationship for retardation. Under this, General Norstad, who also served as Commander-in-Chief, Allied Air Forces in Central Europe, would

A Headquarters, AAFCE, study concluded that the most effective use of [redacted] for the European [redacted] mission would be in attacking enemy air forces

It was pointed out that sufficient aircraft would be available to deliver the weapons at any rate desired and that [redacted] would even be in flight-bomber range. The operational forces consisted of one SAC medium bomber wing which was already deployed in

[redacted]

the [redacted] five SAC medium bomber wings which would be deployed after D-Day and the 49th Air Division* which would be available under USAFE control by July 1952.

Support elements for atomic operations also existed in the form of

It was pointed out that coordination ha already been made between the SAC and SACEUR under which General Norstad acted as SACEUR staff officer for atomic plans and SAC established a command element (XRAY) in Headquarters, USAFE. Gen. Matthew B. Ridgeway, sucessor to General Eisenhower as SACEUR, used this study in an appeal to the Joint Chiefs for a larger allotment of bombs, holding that on which his planning was proceeding was insufficient.[51]

In spite of the conflict with the strategic air mission of the command General LeMay, the SAC commander, accepted the retardation mission without objection. In a letter of May 1951 to Maj. Gen. Thomas D. White, Director of Plans, Headquarters, USAF, he stated that all retardation target which could be identified prior to hostilities should be assigned to the SAC, since these were non-tactical (i.e. fixed) targets. In addition, he contended that

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*The division consisted of a light bomber wing of 2 squadrons of B-45's (35 aircraft) and a fighter bomber wing of 3 squadrons of F-84G's (100 aircraft).

[redacted]

because of the limited number of bombs and suitable delivery aircraft the other retardation targets of fleeting type should also be assigned to the SAC, although without earmarking a definite number of bombs or bombers, and that appropriate command structure communications and procedures should be established.[52]

Nevertheless, the increase in the atomic capability actually controlled by SACEUR during 1952 and 1953 led in March of the latter year to an informal agreement between Gen. Omar Bradley, Chairman of the Joint Chiefs, and Gen. Hoyt S. Vandenberg, Chief of Staff, USAF, that the SAC should be relieved of its retardation responsibility. Strong opposition developed, however, in the War Plans Division, which recommended against initiating formal action within the JCS. The arguments advanced clearly show the effect of atomic weapons in breaking down the boundaries between strategic and tactical air power. While conceding that retardation was inherently a tactical air mission and that it decreased somewhat the SAC effectiveness in its primary strategic mission, the War Plans Division contended that the advantages gained for the Air Force were greater than the disadvantages. First, the inherent flexibility of air power was maximized and the best aircraft for each mission could be used. Second, surrendering the retardation mission would foster an Army-Navy coalition to accomplish an Air Force task which only the SAC was currently capable of executing. Third, the only source of suitable aircraft within the Air Force was the SAC, until the TAC received two wings of B-66's programmed for 1956, since the study by Group BAKER had indicated a requirement for a large number of Mark 6's which could only be carried by SAC aircraft (with the exception of a few Navy AJ's).[53]

[redacted]

With the approval of General White, now Deputy Chief of Staff, Operations, the matter was dropped, and the SAC continued its responsibility for a retardation mission secondary to its primary strategic one.

Operational Planning

As seen elsewhere, the targets to be struck by the strategic atomic force, the type and number of bombs in stockpile, the number allocated for various roles and missions, and even the number of atomic modified delivery aircraft had come to be matters for JCS determination by the end of 1948.* Operational planning for the SAC had come to consist of taking the JCS approved target list and working out the most expeditious, potentially effective, and economical means of delivery, using available materiel and manpower. The SAC was frequently asked to comment to the JCS on target systems as to operational feasibility, but could not alter them.

The first emergency war plan prepared by the SAC and approved by the JCS was EWP 1-49.** Limited to the initial deployment of the SAC forces and initiation of the atomic campaign, it was prepared by the SAC in compliance with a directive contained in JCS 1974. The initial plan provided for the delivery of

*See Volume II, Chapter 6H and below Chapter 8B.

**The SAC had prepared several earlier plans for an atomic offensive. These were tentative in nature, since they lacked JCS approval. The earliest was apparently Project 14-47, set forth in January 1948, which called for the delivery of . Actually this was an objective plan, since neither sufficient aircraft nor bombs existed at the time to implement it. A much more realistic plan was VENTUROUS, completed as the SAC operational plan for the USAF atomic plan HARROW in December 1948. (Ltr., CS SAC to Actg DCS/O, sub.: Increase in SAC Atomic Delivery Capability, 1948-1954, 18 Aug 1958, Enclosure 2; see also Volume II, Chapters 6F, 7F, and 7G.)

[redacted]

against [redacted] listed in the document. SAC medium bomber forces were to deploy to the [redacted] and heavy bomber forces would stage through Alaska in operations including the 8th Air Force, 15th Air Force, 311th Air Division, and 3rd Air Division. Support would also come from the AMC, MATS, CONAC and AFSWP. Deployment would begin on E plus 1, and all five medium bomber units would be in place by E plus 6. Atomic bombs would be supplemented by the use of conventional bombs.[54] The plan was intended as the atomic weapons supplement to TROJAN (JCS 1844/32.)

SAC EWP 1-49 was approved by the JCS, subject to certain reservations, on 18 January 1950. In particular, the JCS had meantime approved a much broader and more specific target system contained in JCS 2056, 31 August 1949, and the Commanding General, SAC, was enjoined to bring the EWP into conformity with this.* The SAC was also directed to provide sufficient details on logistics requirements to enable supporting planning and evaluation by the JCS and to make provision for the emergency support of other JCS commanders.[56]

In reply the SAC reported that it was already engaged on EWP 1-50 to cover Phase 1 of OFFTACKLE (JCS 1844/46 and 55), and would include the necessary revisions in it, since EWP 1-49 to support TROJAN was already obsolescent. The new EWP would include the retardation mission, but without affecting the target system through the designation of particular retardation targets. EWP 1-50 as completed by SAC and forwarded to Headquarters, USAF, on 16 May 1950 was based on force capabilities of 1 July 1950 and provided for the following deployment: (1) 2 heavy bomber wings and 1 heavy reconnaissance wing from

*A few days later, on 24 January 1950, the JCS approved OFFTACKLE. (JCS 1844/46.)

[redacted]

the Zone of Interior in winter or Alaska in summer; (2) 2 medium bomber wings and 6 tanker squadrons from the Northeast Area; (3) 6 medium bomber wings, 1 2/3 medium reconaissance wings, 5 escort fighter wings, and 2 tanker squadrons

the 8th Air Force, operating heavy bombers and heavy reconaissance from the United States and Alaska; the 15th Air Force, operating from the [redacted] and the 3rd Air Division, providing logistic support from [redacted]. Supporting forces would be the AMC, MATS, CONAC, [redacted] JCS commanders in Alaska, Europe, and elsewhere, AFSWP, and miscellaneous British [redacted] military forces.[56]

The concept of operations called for an early retaliatory strike with heavy bombers [redacted]. Meanwhile, other medium bomb units would deploy to the [redacted]. Tankers and medium bombers from [redacted]. The second strike would be launched from the [redacted] while the [redacted]

The plan was returned to the SAC for revision in September 1950, principally on the grounds that the plan considerably exceeded USAF capabilities, particularly in the logistics requirements at the forward bases. The situation as to deployment had also been changed by

[56]These bombers were modified for in-flight refueling. See Volume II, Chapter IID.

[redacted]

a heavy commitment of SAC forces to the FEAF.[57] Meantime, action would be taken by Headquarters, USAF, to remedy numerous deficiencies at

It was the view of some in Headquarters that the SAC had intended EWP 1-50 as a statement of short-range requirements or desirable goals and that its actual operational order would necessarily have been more modest.

During the remainder of 1950 and the first part of 1951 SAC EWP 1-49 remained in effect. Meanwhile, the Air Force program was being rapidly expanded on an emergency basis. In order to attain a closer correlation between the Emergency War Plan for SAC and the expanding, but fluid Air Force potentiality, EWP 1-51 was prepared in Headquarters USAF by a team from SAC headed by General Sweeney in conjunction with the Air Staff. Completed and submitted to Headquarters, USAF, on 7 March 1951, it was approved by the Chief of Staff and submitted for approval to the JCS on 24 April. Although the Navy offered numerous minor objections, the principal objections came from the Army, which described it as essentially a capabilities or limited requirements plan of outline type rather than a detailed emergency war plan. The Army also insisted that specific units be earmarked for the retardation mission.[58]

To compose the conflicting viewpoints an ad hoc committee was appointed to function under the Joint Strategic Planning Committee. The Committee recommended a compromise version of the plan in September 1951, and after concurrence from the Joint Logistics Plan Committee the plan was approved by the Joint Chiefs on 22 October. The final version provided that the Air Force would

[redacted]

No specific allocation of bombs was made, it being provided that the JCS would direct the proportion of bombs employed by the SAC to be used for strategic and for retardation purposes.[59] An important factor in the long delay in establishing a new EWP to replace 1-49 was the failure of the JCS to approve a new target system to replace that set forth in JCS 2056 as a basis for planning. JCC 2056, which had been approved 24 Oct 1949, continued to provide the basis for the new EWP 1-51, since the SAC reported that the interim system adopted by the JCS in early 1951 (described in JCS 2056/9) would create severe operational problems. As a result, pending the approval of a more permanent target system, 2056 remained in effect.[60]

The new plan, EWP 1-51,* provided for an offensive by 6 heavy bomb wings operating from the United States and [redacted] operating from the [redacted]

*SAC EWP 1-51 was the latest approved plan which the author was able to secure for historical presentation. Apparently, however, it remained in effect throughout 1952 and at least the greater part of 1953. A successor plan 1-53 was reviewed in Headquarters during the summer of 1953 and returned on 6 August with the recommendation that it be revised to reflect the new 120 wing program objective, but otherwise approved. (Ltr, D/Plans to Com SAC, sub: SAC EWP 1-53, 6 Aug 1953, in OPD 381 SAC 23 Mar 1949.)

[redacted]

The exact tactics and techniques to be followed by the SAC in its strategic atomic strikes can be presented only in summary form and only for the early part of the period covered by this volume. This material has been considered to be highly sensitive despite the time lapse and has still been made available only in part.

During the early part of the period 1949-1950, three bomber types were relied on--the B-29 and B-50 medium, and the B-36, heavy. According to plans current during early 1949, when no air refueling system was yet operational, these aircraft would operate from bases in the [redacted] and Alaska. Although the Russian air defense capability was not greatly feared, the length of the missions required unescorted operations, and it was planned to take every advantage of darkness and inclement weather. Since the high latitude involved produced a fluctuation in hours of darkness of from 4 to 15 per night, accurate timing would be of great importance.[62]

Tactics would vary somewhat according to the depth of penetration, the season of the year, and the resistance affected. No escort was planned for those strikes occurring during the winter and autumn months, although local fighter protection would be maintained where possible during take-offs and landings; however, during summer months fighter escort was planned where practicable during the daylight portion of the flight when this extended to the periphery defenses.

The atomic bomber force, small in number at the time

[redacted]

[redacted] bases, remaining there only long enough to be loaded and serviced. The atomic bomb carriers would normally be in the ratio of [redacted] other bombers the latter being loaded with conventional bombs and ECM equipmen

The above tactics were set forth officially in December 1948, and for the initial attacks a possible attrition loss of [redacted] was accepted for the duration of the air atomic compaign. [redacted] it was considered that ample capability existed to deliver it even if maximum losses were suffered. Actually it was believed that the air defense capabilities of the enemy would decline rapidly with a consequent reduction of losses.[65]

These tactics remained basically unchanged at least until near the end of 1950, although of course refined in detail. Writing to

[redacted]

[redacted]

Maj. Gen. Kenner S. Wilson, Assistant for Atomic Energy, in November 1950 Maj. Gen. Thomas S. Power, Deputy Commander, SAC, reiterated the SAC's intention to take maximum advantage of cover provided by darkness and inclement weather and to exploit the electronic countermeasures capability. He went on to state:[66]

No further information on specific tactics to be followed in strategic atomic strikes has been available for this history. Obviously, these tactics must have been affected by the development during the period of such factors as increasing Russian air defense capability, increasing numbers of foreign bases available, increasing size of stockpile, availability of bombs of greater yield and with a wide range of yields, increased delivery capability in terms of modified aircraft, addition of the B-47 to the medium bomber force, and the addition of an extensive refueling capability.

[redacted]

[redacted]

[redacted]

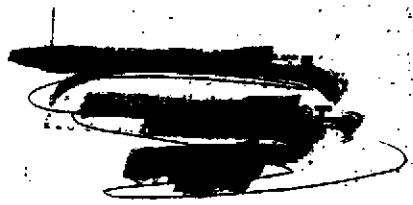
[redacted]

[redacted]

[redacted]

[redacted]

[redacted]



Meantime, the shift to the forward storage concept together with establishment of the Operational Storage Sites made necessary several changes in the SAC logistical system for the handling and transport of atomic weapons. As seen in Volume II, the first assembly teams assigned to the SAC were 77 man units termed capable of full assembly of the Mk

In September 1949, in order to provide a unit more suitable to the rear-forward type of operation planned by the SAC, these units were reduced to 46 men. Although still officially designated s, they were generally referred to as ' ! t was planned that they would be assigned to the SAC and attached By June 1950 of these units had been trained and assigned to the SAC, the number rising to by the end of the year. Each was capable of giving final assembly to [71] The would deploy with the wing, along with the partly assembled nuclear and non-nuclear components (picked up at the National Storage Sites) to a forward operational base and there perform the limited inspection and final assembly known as the operation prior to the atomic strike. The Air Force also planned to establish depot type organizations capable of both surveillance and assembly which would function at the National Storage Sites and assembly-inspection units for Operational Storage Sites and naval storage.

As will be seen in Chapter 9 of this volume, a general reorganization of the Air Force atomic logistics system occurred in 1950-1951. Under the "Twining letter" the Air Materiel Command was directed to assume control of the new Operational Storage Sites being constructed adjacent to certain SAC bases in this country as part of its general responsibility for the storage of atomic weapons and equipment under the operational control of the Air Force. The AMC was also charged with the development of necessary supply and maintenance responsibilities to accomplish this responsibility. Since projected Operational Storage Sites were located on SAC bases, the SAC and AMC reached a policy agreement in December 1951

under which each site area would operate under the jurisdiction of the AMC as an exempted institution, with the SAC supplying limited support services. The arrangement was looked on as a temporary one, with the sites ultimately passing to SAC control. The AMC, in addition to its storage responsibilities, provided close technical control and technical direction

controlled by the SAC and

The above situation was considered to be increasingly dangerous in the light of growing Russian atomic capability and the need for

both reducing and the vulnerability of the strategic striking and increasing the speed of execution of the Emergency War Plan. During 1954 the Air Force began to push for approval of its long standing objective of complete bombs available [redacted] The principle was approved by the JCS in October and by the DOD, AEC, and NSC in December 1954, although Presidential approval did include a limitation on the [redacted] Implementation of the bombs on base program was to get under way in 1955.[74]

[redacted]

[redacted]

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CHAPTER V

TACTICAL AIR EMPLOYMENT OF ATOMIC WEAPONS

Early Planning

The Air Force does not appear to have seriously considered the tactical employment of atomic weapons apart from their use for strategic air warfare prior to 1949. This appears primarily to have been due to the prevalent belief that atomic weapons because of their great cost and the scarcity of fissionable material would remain relatively few in number and secondarily to an attachment to a belief in the primacy of strategic air warfare per se. Both these attitudes appeared in the resistance by the Air Force to the proposed development of a weapon by the Navy—first, because fissionable material was too valuable and scarce to be wasted in inefficient weapons; second, because the proposed weapon lacked a practical value in strategic air warfare. Although it is true that the Air Force later decided to provide for at least limited use by its aircraft of the Mark 8, and even assumed a leading role in the establishment of requirements for another smaller weapon, , these moves were apparently made in part to avoid being jockeyed out of the development picture.* Both weapons were ostensibly intended by the Air Force for strategic use, especially as warheads for proposed guided missiles.

The first definite staff action looking toward the use of atomic bombs in tactical air warfare was apparently that taken by AFOAT on 1 July 1949 when it proposed to the Directorate of Plans and Operations

*See Volume II, Chapter 13C and D.

that the Air Force investigate the possibility of employing the atomic bomb as a tactical weapon.* AFOAT pointed out that it now appeared that within a few years the stockpile of atomic bombs would greatly exceed the number required for a strategic air offensive; that the United States was becoming committed to denying Russian access to Western Europe, which would involve widespread use of tactical air power; that the subject of using the atomic bomb as a tactical air weapon was already being studied by AFSWP; and that the Air Force was the agency which should logically study the operational aspects of the problem. AFOAT urged that the Air Force immediately take steps to prepare plans for the employment of the atomic bomb as a tactical air weapon, to have the Air Intelligence Division with the help of the Tactical Air Command select suitable targets for that purpose, and to have the Strategic Air Command and Tactical Air Command study the tactics and techniques of employment.[1]

The subject was actively discussed in Headquarters during July 1949, and Col. Brooke Allen of the Strategic Vulnerability Branch, Directorate of Intelligence, carried out a technical study on the topic. Field Command, AFSWP, also desired to go ahead on the preparation of a feasibility report in conjunction with Sandia Laboratory and requested Headquarters, AFSWP, to ask for advisers from the three services. After discussions between Maj. Gen. Roscoe C. Wilson, Assistant for Atomic Energy, Maj. Gen. James McCormack, Jr., Director of Military Application of the AEC, and Rr. Adm. Tom B. Hill, Navy member of the MLC, it was agreed that working level discussions would

*AFOAT was apparently spurred to action by the fact that it had learned that the Plans and Operations Division, Headquarters, U. S. Army, had under way a study of tactical targets in Europe west of the Vistula for atomic bombs.

be conducted in Washington rather than at Sandia, with each of the interested agencies represented. It is not clear what concrete results came from these discussions, involving Dr. George Gamow of the AEC, Col. Brooke Allen of the Air Force and others.[2]

Meanwhile, the Weapons System Evaluation Group began a study on the use of the atomic bomb on tactical targets which was completed on 8 November 1949. This evaluated the effect of the bomb on such targets as troops, aircraft, and ships massed for offensive operations; naval bases; airfields; naval task forces; and heavily fortified positions, reaching favorable conclusions in all cases. The study also emphasized that such use could be much more selective in nature than strategic bombing and thus reap psychological advantages both within and outside the Iron Curtain countries. It recommended that an appropriate Department of Defense agency make a detailed study of tactical use of the atomic bomb.[3]

The study, which was considered to be informal and not an official report requiring action, was noted within the Air Staff. However, no organized program of action to develop a tactical air atomic capability was formulated until July 1950, when the outbreak of the Korean War had served to emphasize the weakness of the NATO forces in the event the Russians decided to utilize the opportunity to attack in Europe. The immediate initiative came from AFOAT, where Col. John D. Stevenson, later to command the 49th Air Division, pointed out that no doctrine or specific program existed for the tactical air use of the atomic bomb, although a requirement had been established.

Immediate staff action under AFOAT leadership followed, and on 10 July 1950 interested Air Staff agencies met and agreed on a detailed program to develop tactical air atomic capability.[4] This was divided into two phases--1950-54 and 1950-60--as follows:

A. 1950-1954
1. Determine F-84 capability to carry [redacted] (DCS/D).
2. Modify the three or four B-45 squadrons to carry TX-5(DCS/D).
3. Expedite development of suitable bomb directors (DCS/D).
4. Set up a range and train TAC crews in Sheran technique (DCS/O, DCS/P).
5. Take action to procure TX-5 and [redacted] practice bombs so that TAC training in loading and dropping can start as soon as possible (AFOAT).
6. Work out administrative and technical chain of command to TAC, omitting CONAC (AFOAT).
7. Start clearances on key TAC personnel (AFOAT).
8. Brief and indoctrinate TAC personnel in atomic energy (DCS/P).
9. Transfer one or more assembly teams to TAC (DCS/P).
10. Develop logistic support for TAC atomic operations and development (AFOAT).
11. Develop maneuver plans with Army and Navy for tactical application (DCS/O).
12. Designate and develop the Air Staff equivalent of SAC Section, ZI Branch, for TAC business (DCS/O).
13. Temporarily reinforce AFOAT with TAC personnel for orientation and ultimate assignment to other USAF staff agencies (AFOAT).
14. Develop tactical doctrine for handling B-45, TX-5, and F-84-[redacted] combinations (DCS/D, DCS/O).
15. Study target system for appropriate targets (DCS/O, AFOIN).
16. Select a suitable bombing range for drop of practice A-bombs (DCS/O).
17. Select the key TAC base or bases for operational training (DCS/O).
18. [redacted]
19. Develop military characteristics for [redacted] and implosion weapons (DCS/D).

B. 1950-1960
1. Place a development requirement on AEC [redacted] (AFOAT).
2. Determine F-84 capability to [redacted]
3. Design the F-88, F-90, F-93 series to carry [redacted] (DCS/D).
4. Order [redacted] weapons (AFOAT).
5. Develop tactical doctrine for fighter bombers (DCS/O, DCS/D).
6. Place a development requirement on AEC for [redacted] engr (AFOAT).

[redacted]

7. Design the successor to F-88, F-90, F-93 series to [redacted] and/or [redacted] (DCS/D).

It can be seen from the above list that the near term program was based primarily on use of the B-45 to deliver the TX-5 and the F-84 to deliver the [ ] (TX-8). Slightly less than 100 of the B-45, the Air Force's first operational jet bomber, had been produced, larger production having been rejected in favor of the B-47, which was still undergoing development testing.* Two squadrons of B-45's had been activated within the Tactical Air Command, and were thus immediately available. The F-84E was also becoming available in production quantities. The TX-5 was nearing the end of its development and would be preoftested at GREENHOUSE in the Spring of 1951, while the development of [ ] was virtually complete. It may be noted that the development of the TX-7 [ ] was also well under way and that this weapon, more efficient than the [ ] was also suited for carriage by fighter bomber.** For later supplement of the limited number of B-45's the XB-51 and Canberra were also under consideration by the Senior Officers' Board.

Under the emergency war plan the Strategic Air Command had already been assigned a [redacted] mission, and on it was based one of the three major target systems. The Strategic Air Command was also required to provide a capability against targets of opportunity of interdiction type.*** This had been provided within the SAC by the regular atomic striking force, particularly through the modification of some

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*See Volume II, Chapter 12C.

**The 5 was stockpiled in 1951, the in 1951, and the in 1952, becoming respectively the

***See above Chapter 4D.

[redacted]

B-29's to carry Shoran bombing systems for operation against forward area tactical targets. Although some Tactical Air Command officers began attendance at the Sandia courses for bomb commanders and staff officers as early as July 1950, the Command first began to enter the program on a large scale with informal planning efforts on the receipt of the USAF study, "Tactical Targets Suitable for Attack with Air Burst Atomic Bombs," in early November 1950. Formal participation began on 14 November with the receipt of a letter from Headquarters, USAF, directing the Command to develop tactics and techniques for utilizing atomic weapons in tactical air operations. The TAC, at that time a part of the Continental Air Command, was to become a major command on 1 December 1950.[5]

Late in December 1950 Maj. Gen. Willard R. Wolfinbarger, the Commanding General of the TAC, pointed out that if an early capability were highly important the best possibility lay in the modification of a small number of B-45's to carry the Pointing out that the bombs would not be available until 1952 and that the B-45 was the only aircraft both suitable and immediately available for tactical delivery of the he urged that 10 of them be modified at an estimate cost of between $6500 and $10,000 each, Shoran and visual bombing equipment installed, and the aircraft assigned to the TAC. He estimated that a penalty in radius of action and top speed of only 15 per cent would be incurred by the modifications. The proposal was rejected, however, by Headquarters, USAF, in favor of a longer term program under which a small number of B-45A-5's and E-8AE's would be modified to serve during 1951 for both training by the TAC and operational testing by the Special Weapons Command (under the direction of the AMC). The Air Research and Development

[redacted]

Command was directed also to complete the study, development, and flight test programs by 1 October 1951.[6]

Vigorous action was taken on this program by the TAC before the end of the year with the designation of the 84th Bomb Squadron, Light Jet, as the atomic test unit. Previously a B-45 squadron, under its new mission directive of 27 December 1950 it was now assigned as a composite squadron nine B-45A-5's and seven F-84E's in order to develop tactics and techniques for the employment of atomic weapons. These two types of aircraft would be modified to carry the Mark 5, 7, and 8 and the Mark 7 and 8 respectively. Training exercises were planned following the delivery of these during the latter part of 1951 and joint maneuvers in early 1952. The TAC also established in December 1950 a Directorate of Special Weapons within its headquarters staff to formulate special weapons plans, doctrine, concepts, procedures, requirements, programs, and training standards; monitor all activities and organizations functioning within the field of special weapons; and represent the TAC on such boards and committees as the AFSWP Special Weapons Development Board. Officers were assigned to the TAC from the SAC and AFSWP to aid in the program, and a liaison office was established at the Special Weapons Command.[7]

The program received further impetus on 15 January 1951 with the issuance of a directive by the Vice Chief of Staff, USAF, outlining a staff program to insure an early attainment by the TAC of tactical atomic capability. During early 1951 the TAC also formulated a program of action calling for the development of a capability in at least one wing of piloted aircraft by January 1952 and a capability with one Matador Squadron shortly thereafter. It recommended to Headquarters, USAF, that capability should be developed on a full group

rather than squadron basis, with all fighter-bomber and light bomber wings to eventually have tactical capability. Planning had also crystallized in regard to the establishment of [redacted]. In addition the command had formulated definite plans for the establishment of the first Matador Missile Squadron, which would utilize the Matador surface-to-surface guided missile to deliver both atomic and conventional warheads.[8]

Increased pressure was provided during 1951 on the establishment of a tactical air capability, if any was necessary. This came from several directions. The Army was actively pushing for the development of its atomic cannon, which it argued was the only means of providing assured and accurate atomic support to NATO ground forces in the event of attack by the Russian masses under the conditions of poor visibility common in Western Europe. The Navy was rapidly developing [redacted]based aircraft suitable for the carriage of the smaller atomic bombs under development and argued that the [redacted] provided a safe and flexible means of atomic weapon storage. Meanwhile, the indecisive warfare in Korea made obvious that there were possible occasions for tactical atomic warfare when the use of a strategic capability was stalemated by other considerations.[9]

Pressure also came from the Joint Congressional Committee on Atomic Energy, whose chairman, Senator Brien McMahon, was pushing strongly on two fronts for an all out effort to develop the thermonuclear bomb for strategic use and a greatly increased program for the development of tactical atomic weapons and systems for using them.[10] The AEC itself and its General Advisory Committee, although deeply divided on the thermonuclear bomb, were willing and anxious to push ahead on tactical atomic weapons. Basically, the attractive argument was presented that tactical

[redacted]

atomic weapons are "the natural armaments of numerically inferior but technologically superior nations" and "a natural answer to the armed border of the Soviet Union and its satellites." It was also argued that they were more humane than strategic atomic weapons and would return warfare to the battle area, where it belonged. Discerning persons immediately saw that the question of allocations would be thrown into turmoil between different kinds and sizes of bombs, between the forces of different services, between peacetime and military. Tactical use would represent a broad expansion of the whole complex of planning and development problems associated with atomic warfare.

In this situation the Air Force went with the tide and even assumed a leading position. Not only was the hardware and training program pushed rapidly forward for but concepts of atomic employment were rapidly reworked. At the direction of the Deputy Chief of Staff, Operations, on 22 May 1951 a broad study was carried out by War Plans Division, AFOAT, Intelligence, and the Directorate of Operations to establish more firmly the types of target to be attacked, tactics to be used, weapons and delivery systems to be employed, and over-all requirements for tactical air offensives with D-Days of 1 July 1952 and 1 July 1953.[11] Work also went rapidly forward for an Air Force manual on the tactical employment of atomic weapons.[12] Veteran tactical air commanders

[redacted]

like Generals Cannon and Weyland were enthusiastic at the revival of interest in tactical air warfare.[13] Weyland urged a tactical atomic bomber force of six wings in the Air Force ready for use where needed.

Planning continued to move forward rapidly during the first part of 1951 in close coordination between the TAC and Headquarters, USAF. On 6 April Headquarters, USAFE, nominated targets to retard a Soviet land advance and to impair a Soviet air atomic offensive. On 5 July Headquarters, USAF, decided to aim for an operational tactical air atomic capability of five F-84 squadrons and one B-45 squadron by 1 April 1952. This decision was based on the rapid progress reported by the Wright Air Development Center in testing the F-84, which showed the feasibility of the carriage of the . On 28 August the Joint Chiefs of Staff notified the Atomic Energy Commission that the Air Force and Navy would be prepared to deliver by early spring of 1952 and stated a requirement

[redacted]

Meanwhile, on 17 August 1951 TAC was directed to organize, equip, and train a tactical atomic air force for deployment by April 1952. As the force would be relatively small, it was decided to organize it as an air division, which was given the numerical designation of 49th. The following units were assigned to it: the 49th Air Division Headquarters, 20th Fighter Bomber Wing (less one squadron),

[redacted]

[redacted], 104th Communications Operations Squadron. The program to organize and deploy overseas the proposed force was given the designation [redacted] and was established as a special project immediately below the strategic offensive units of SAC on the USAF precedence list. The SAC was to be relieved of part of its atomic delivery requirement in recognition of the shift of the [redacted] mission.[19]

The various units of the 49th Air Division were assembled at Langley Air Force Base during 1951 and early 1952. The 47th Bomb Wing was organized in March 1951 from TAC units which had been flying B-45's since October 1949; the 20th Fighter Bomber Wing was added in December; and the [redacted], which was trained at Sandia Base, reported at Langley in December 1951. Headquarters, 49th Air Division, was reactivated at Langley in November 1951, and in March 1952 was redesignated the 49th Air Division, Operational, with a changed Table of Organization which gave the commander operational, rather than full command control. The command control would rest with the numbered air force to which the division was assigned, in this case the Third. By February 1952, strength in aircraft stood at 100 F-84G's and 32 B-45's.

Operationally, as deployed, the 49th Air Division consisted of 1 fighter group, 3 squadrons of fighter-bombers (F-84G's), and 1 light bomber group of 2 squadrons (B-45's).

Bombs were dropped by visual sighting from a 60° dive using a computing sight. The F-84G had a combat radius of 600 nautical miles, allowing 20 minutes over the target. Good weather and daylight were required for the mission, and the expected accuracy under these conditions was

c

It employed airborne radar, Shoran, and M3Q bombing systems entirely, having no visual sight, and required special target photography prior to strike. Bombing accuracies of

although in the latter case only within the of the ground

directors.[18]

The 49th maintained its status with little change until December 1953, when the 47th Bomb Wing was increased to 3 squadrons by the assignment from the Tactical Air Command of the 422nd Bomb Squadron (Light). This had been converted from B-26's to B-45's; however, all 16 of its B-45's were out of commission for modification at the time of arrival. In late 1953 the 49th was also notified that the 81st Fighter Interceptor Wing would be transferred to it on 1 March 1954 for retraining as an atomic fighter bomber wing. For this purpose it would be re-equipped with F-84F's to replace its F-84A's.[19]

BACKBREAKER

The modification phase of , which was given the designation BACKBREAKER by the Air Materiel Command, became firm in July 1951. BACKBREAKER utilized the service tests conducted by the 84th Bomb Squadron as well as test results from the Special Weapons Command, the Research and Development Command, and the Wright Air Development Center. The first BACKBREAKER meeting was held at AMC headquarters on 24 July 1951, and by the second meeting a week later the program was fairly well outlined. It called for the modification of 107 F-84G's and 41 B-45's, and was given an S-1 supply priority just under the SAC's ON TOP.[20]

Final logistic requirements were determined on 9 August, when it was finally announced that the TAC would have the operational program. The logistical program was split into two phases: everything pertaining to aircraft of direct aircraft support, loading, and monitoring was an AMC responsibility, while that equipment necessary for the development of weapons assembly and its testing prior to delivery to the aircraft

was assigned to the Special Weapons Command. The initial deadline date was set at 15 February 1952 for the F-84's and late March for the B-45's.[21] The scheduled delivery of the B-45's was successfully met, but the last of the F-84's was not delivered until 1 April, partly because F-84G's from new production were substituted for the F-84E's. Although the F-84G was basically superior to the earlier model, since it incorporated in-flight refueling provisions and a higher thrust engine, certain malfunctions developed which delayed production.

Shortly before this the TAC had completed and issued a manual setting forth an operational concept for the tactical employment of atomic weapons. It is also interesting to note that the Chief of Staff, USAF, in informing the Joint Chiefs of Staff of the deployment of the 49th Air Division, emphasized the concept of flexibility in the proposed employment of the unit--that the term "tactical air," like "strategic air," transcended area limitations.[25]

Probably the most serious problem which appeared during the development of a tactical air capability for the delivery of atomic weapons was the technique to be employed in the dropping of bombs from the F-84 at relatively low ceilings, which were quite common in Europe. This constituted an entirely new problem, since the conventional bombs previously employed in tactical air warfare were not

. and of course had nothing like the area of destruction. The TX-8, which was a

, did permit a low level release and escape of the delivery aircraft, and for this reason primarily the Tactical Air Command in January 1951 stated a requirement for this weapon.

Nevertheless, the attitude of both the TAC and the Air Force remained apathetic toward the Navy-developed weapon, both because of its very low efficiency and the very limited requirement for a penetrating weapon. Consequently, some substitute system which would permit the use of the TX-7 under a low ceiling was eagerly sought for.[24]

Because high altitude bomb sights were complex and bulky, it was impossible to consider these for use in the F-84, which therefore was limited to dive bombing and low level techniques of attack. To achieve maximum effect with

] Using the simple A-7 sight (based on the A-1C) with which the BACKBREAKER F-84's were equipped and employing the steep dive angle (55 degrees) required, it was found that release of a [ ] feet in order to allow the pilot a reasonable chance of escape. Furthermore, a weather study of European conditions indicated that a three tenths cloud cover existed at 6,000 feet for about 60 per cent of the year. In effect, these factors reduced the A-7 to the status of emergency capability only, since a three tenths cloud cover would virtually eliminate any thought of visual dive bombing with atomic weapons.[25]

As possible alternatives which would permit replacement of the A-7 sight over the longer term, two possibilities appeared promising. One system would employ the technique of dive-toss bombing, a variation of the usual procedure of dive bombing in that the pull-out maneuver would begin prior to the release of the bomb. This would require a more complex computing sight, and this was available in the form of the BT-9 sight, which has been developed by a Swedish firm, the SAAB Aeronautical Company. The Navy had also developed a sight for this purpose, but this was considered to be inferior to the Swedish

item. The Air Force effort to purchase a quantity sufficient to equip the BACKBREAKER F-84's was delayed by difficulties arising from Public Law 245 until July 1952, when a contract for 146 items was at length signed. This also provided for the sale of plans and licensing of American production. Subsequently, the Air Force ordered somewhat over 900 items of a somewhat improved version, designated the M-1, from an American concern, the Morgenthaler Linotype Company. At the end of 1953 neither sight had even begun to replace the A-7 as an operational item. The BT-9's delivered had been stored pending completion of operational suitability testing, and only the prototype M-1 had appeared. It seemed likely, therefore, that the A-7 would continue as the operational fighter bomber sight for some time to come.[26]

It should be pointed out that neither the BT-9 or M-1 would solve the operational problem presented by low ceilings or even partial cloud cover, since both visibility of the target and a high altitude release was required, as in the case of the A-7. To deal with this crucial problem Captain John A. Ryan and Captain John W. Hanlen of WADC presented a scheme for low-level toss bombing employing only relatively simple equipment which might be in production by the Fall of 1952. Basically the system proposed the release of the bomb at a speed of 550 miles per hour at an altitude of 600 feet through automatic control during a four G climb at 20 degrees above the horizontal. The system would be actuated by the pilot at an established interception point, and automatic release would follow during the resulting climb as in the case of the divetoss system. The bomb would explode at

[redacted]

[27]

One of the great virtues of the proposed system was that the

computer required would be made up of existing components. These would require only slight modification before being combined into the finished sighting instrument. The Wright Air Development Center secured authorization to procure 10 prototype computers for development test in March 1952, and these items which were hand assembled by the Massachusetts Institute of Technology, became available in May. On the basis of tests which revealed by October the complete practicability of the system, Air Force Headquarters immediately established a formal requirement for the installation of the LABS system in all Air Force fighter aircraft capable of carrying atomic weapons. A contract for 100 was accordingly negotiated with the Minneapolis Honeywell Company, and actual manufacture began in December of the same year, with delivery of the first production items to come in March of 1953 and the others scheduled to follow by 1 June. Installation of the first production computers in the aircraft of the 20th Fighter Bomber Wing of the 49th Air Division in England began soon after, together with a training program. Meanwhile, the Strategic Air Command and the Far East Air Forces were expressing great interest in the new system and asking for quick delivery of the equipment for their aircraft.

Since the 100 LABS computers on order would not suffice even to equip the BACKBREAKER aircraft and since on 13 February Headquarters, USAF, directed the AMC to speed up the equipment of all USAF fighter bombers with the LABS, it was necessary to contract for the production

of 254 additional computers to meet the immediate demands for BACK-BREAKER, FEAF, and SAC. The program was also revised to provide for its handling as Phase IX of ON TOP, which already had a top priority. Under the revised arrangement 85 of the first 100 computers went to the BACKBREAKER aircraft and the remaining 15 to FEAF. Of the 254 LABS computers on the follow-on contract, 15 were to go to BACKBREAKER aircraft, 15 to FEAF, and the remaining 239 to the SAC. The SAC installations were to begin in June 1953, meeting that organization's urgent demands. A contract for 2,536 computers was let to satisfy further demands.[29]

Using bombing tables which became available in January 1953, the Air Proving Ground carried out operational suitability tests during the year which resulted in a conclusion that 80 per cent of bombs delivered could be expected to fall within

The Proving Ground also concluded that the aircraft retrofit could be easily carried out in the field, that the equipment was reliable and durable, and that it would require a minimum of skilled maintenance. While noting the inherent weakness of the need for careful reconnaissance and an established initial point for triggering, the Proving Ground also pointed out numerous advantages of the new system. Generally, it gave a fighter aircraft the capability of accurately delivering atomic weapons on almost any target under marginal weather conditions under the conditions most favorable to escape detection by enemy radar. It was necessary to have only a 5 mile visibility and 1000 foot ceiling in the target area, though somewhat better than this was required in the penetration zone. However, pilots well versed in navigation might operate under even less favorable conditions.[30]

During the year 1953 two additional maneuvers were incorporated in the LABS as the result largely of proposals emanating principally from the Strategic Air Command. These were the vertical and over-the-shoulder drop techniques made possible by a slight modification to the computer to allow it to be set at angles up to 125 degrees. In the vertical release, pull-up for the Immelman turn was made so that release, which occured automatically at 90 degrees angle to the horizon took place directly over the target, followed by a vertical drop of the bomb. In the over-the-shoulder release the pull-up began directly over the target, release took place automatically at the pre-set angle of 110 degrees during the Immelman, and the bomb fell back on the target. These techniques offered the advantage of release without any other initial point than the target itself. Furthermore, through an additional modification, introduced in December 1953 and making possible the changing of the release angle during flight, in the event the initial point was missed for the standard type of toss release, the angle could then be changed to permit release by either of the other methods. This, of course, avoided the necessity of a second bombing run, an extremely dangerous maneuver under most conditions.[31]

Adding a Tactical Capability in the FEAF

Following the outbreak of the Korean War in 1950, five medium bomb groups of the SAC were [redacted] and placed under a FEAF provisional Bomber Command. [redacted]

[redacted] Atomic weapons were not used, although this was seriously discussed on at least one occasion--in December 1950.* The groups were employed with

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*See below, Chapter 8G.

conventional weapons against both strategic and tactical targets. A principal argument offered against the use of atomic weapons in Korea was the lack of suitable (i.e., strategic) targets in North Korea, to which bombing operations were confined. Indeed, air operations were overwhelmingly confined, after the relatively few factories had been razed, to tactical objectives such as railroads, bridges, truck convoys, supply dumps, troop concentrations, tanks, and combat positions.

Nevertheless, following the carrying out of [redacted] and the movement of the 49th Air Division to Europe in May 1952, attention was drawn to the desirability of a tactical atomic capability in the theater. In September 1952 Lt. Gen. O. P. Weyland, Commander of the Far East Air Forces, requested Headquarters USAF, to establish a tactical atomic delivery capability in his command. The request was approved and a plan of action immediately formulated by Air Force operations. At the time, the disruption of the long continued armistice negotiations was considered a definite possibility. Under the plan as carried out in early 1953, a one-squadron capability was established in the [redacted] The squadron was brought back from [redacted] estaffed by selected FEAF personnel, and trained by a team from the United States. Meantime, the SAC flew in the 25 F-84G's needed.[32]

A tactical atomic weapons team to provide technical services and support was also trained for the FEAF by the [redacted]

The team had a capability of 12 Mark 7's each 24 hours. Class 09B equipment support came from the [redacted]

*By early 1954 this was supplied by the [redacted]

It was estimated that [redacted] would be required under this system to mount an attack [redacted]

In June 1953, General Weyland renewed his request for early achievement of one-wing capability, pointing out that the [redacted] for retraining immediately following the impending Korean armistice.[36] The request was rejected by Headquarters on the ground that all the remainder of the modified F-84G's were already programmed for SAC and that the new F-84F's would not be available till the third quarter of FY 1954.[37]

General Weyland, however, renewed his request immediately following the signing of the Korean armistice on 27 July 1953, pointing out that the position of the Far East Command was now w

He argued that the survival of the FEAF could only be insured by an immediate capability to launch a large-scale counter offensive with atomic weapons.* To provide the necessary modified aircraft, General Weyland proposed that 50 F-84G's be transferred from SAC strategic fighter wings under either of two different arrangements. Fifty trained pilots would accompany the planes, along with special equipment and two technical cells, or in lieu of the pilots a TAC-AFSWP training team. The proposal was approved by the Chief of Staff in early September 1953, along with the second alternative of the training team rather than pilots.[38]

*General Weyland also pointed out the favorable position of the Navy to assume the tactical atomic role in the Far East, since it had fo in the area.

**See below, Chapter 9D.

[redacted]

Establishment of a Fighter Atomic Task Force

As previously seen, the Chief of Staff, USAF, in notifying the Joint Chiefs of Staff of the deployment of the 49th Air Division to Europe on 12 May 1952, pointed out the flexible nature of tactical atomic air units, which like strategic air units were capable of rapid movement to and employment in more than one theater of warfare. Nevertheless, because of various considerations the 49th Air Division was rather closely tied to operations in Europe. By late October, however, the Tactical Air Command was given directions to proceed with the development of an atomic tactical force in which mobility and operational flexibility would be emphasized. Although complete plans as to the strength and manner of operation of the unit had not yet been worked out, the task of carrying out the organization and training was assigned to the Ninth Air Force by the Commander, Tactical Air Command, and the 108th Fighter-Bomber Wing was designated as the key operational unit of the Mobile Atomic Task Force.[40]

The 108th, later to be designated the 405th Fighter Bomber Wing, was programmed to receive F-84F aircraft, but since these were not immediately available, six T-33's were assigned and an instrument training program begun. Arrangements were also made to send all pilots through the Sandia delivery course for tactical pilots. Various personnel screening and security measures were also instituted to assure stable assignment and proper clearances for the new activities of the unit.

By December 1952 the Directorate of Plans, Headquarters, USAF, had prepared and submitted to the Directorate of Operations a fairly detailed plan for a somewhat more advanced concept—that a Fighter Atomic Task Force should be established and permanently stationed in the

United States in a state of readiness for deployment to any area of the world. This plan covered such matters as route planning, airlift support, target selection, reconnaissance, and logistic problems for the proposed force.[45] After study and approval by DCS/Operations, Headquarters directed the Tactical Air Command to establish such a unit early in January 1953, with a readiness date of 1 January 1954.[46]

The plan directed that the unit be composed of the 405th Fighter Bomber Wing and the , that it be based permanently at Langley AFB, and that it be prepared to deploy anywhere in support of a theater air mission. The units of the Mobile Tactical Air Force were to be trained for deployment in four possible ways: (1) as a complete wing with or without its [redacted] (2) as a tactical group with or without the [redacted] (3) as single squadrons with or without elements of the [redacted] (4) through individual strikes launched directly from the Zone of Interior using in-flight refueling or staging bases enroute. The unit was designed either to augment the theater air capability or even to use in areas not within the areas outside the formal boundaries of a theater. It was to be able to execute atomic attacks immediately upon arrival at the strike base from Langley and capable of sustaining operations for periods up to 30 days. Selection of targets and weapons, as well as other mission planning, was normally to be accomplished by the theater commander, but the strike force was to have this capability if required. The deployment or withdrawal of the MTAF forces was to be at the direction of Chief of Staff, USAF, but responsibility was to remain with the Commander, TAC, who would also retain operational control during all Zone of Interior operations and after return. In the theater of operations the unit was to be under the operational

[redacted]

control of the theater commander.[43]

A limited number of atomic weapons and nuclear components were to be designated for each theater for use by the Mobile Tactical Atomic Force, and the theater commander was to have authority to use these at his discretion. The strike force also might transport operational weapons on strike aircraft to the strike bases from the ZI or from overseas sites; receive, load, and test operational weapons at strike bases; receive ready, operational, or packaged weapons; process them; and maintain them in operational condition. The aircraft of the unit, which would be F-84F's, were to be capable of delivering operational

The Mobile Tactical Air Force was to contain when available a tanker squadron capable of three point in-flight probedrogue type refueling. The Force was also to maintain tropic, temperate, and arctic flyaway kits. It was to be almost entirely dependent on the theater for logistic support in all classes of supply. Control of air transport, however, was to be maintained by the Tactical Air Command.[44]

In January 1953 the 405 Fighter Bomber Wing was moved to Langley as the first component; however, the Mobile Tactical Atomic Force failed to become operational during 1953 because of delays in the delivery of aircraft and other equipment.[49] The readiness date, originally 1 September 1953, had been perforce moved to 1 January 1954 and then set back still further. Nevertheless, the Force, though small, represented a potentially valuable addition to the nation's arsenal of atomic weapons delivery systems.

[redacted]

Organization of Matador Missile Squadrons

In June 1951 a phased program to establish a tactical capability in the delivery of atomic weapons by pilotless aircraft was instituted within the Air Force, and like the program for the tactical delivery of atomic weapons by piloted aircraft the principal responsibility was assigned to the Tactical Air Command.[46] Important roles in the program were also delegated to the Air Force Missile Test Center and the Special Weapons Center of the Air Research and Development Command, the Training Command, and the Air Materiel Command. Unlike as in [redacted] the proposed vehicle did not exist in an operational form and had yet to be carried through its late development stage and operational suitability tests. Another serious problem to be dealt with lay in the development of adaption kits which would allow the atomic bomb to be fitted into the missile as a warhead. This phase would be dealt with by the Special Weapons Center. Nevertheless, it was planned to activate the units and train them simultaneously with the final development and testing of the Matador missile, or B-61, the designated delivery vehicle. This attempt to telescope training and development reflected the early availability of the [redacted] and other smaller weapons and somewhat resembled the emergency delivery capability program in thermonuclear weapons. The Matador squadrons, like the [redacted] units, were primarily intended to strengthen the NATO position in Europe.

In this chapter it is not proposed to deal more than incidentally with the developmental problems involved, which will be dealt with in greater detail in Volume V of this history. Instead, the activation, training, and deployment of the missile squadrons will be the principal concern. As seen in Volume II, the effort to develop a short range

surface-to-surface missile had got under way in August 1945 under the project designation MX-771.* The missile was later designated the Matador, or B-61. At the end of 1948 a prototype was ready for test, and the first test flight was made at Holloman on 19 January 1949.** The first YB-61 flew on 22 December 1950, and by June 1951 some 21 missiles had been launched, 19 at Holloman Air Force Base and 2 at the Long Range Proving Ground. Concrete planning for operational use of the missile had begun as early as November 1950, when a conference on the subject was held at Tactical Air Command Headquarters. At that time the Matador, which had already made several successful flights, was reported to have a range of about 250 miles and to be capable of carrying a modified TX-7. It was reported that service tests would begin on the missile in July 1951 and that production items would be available about the middle of 1952.[47]

By March 1951 the proposed Matador operational program had become sufficiently firm to permit the issuance of a tentative directive, including a proposed table of organization for the units and a concept of operations. The basic unit was to be a guided missile squadron which would be assigned to a fighter-bomber or light bomber wing and used to supplement its tactical all weather capability.*** [redacted]

*See Volume II, Chapter 12D.

**Shortly after this, on 30 May 1949, four officers and one airman had been sent to Holloman AFB as a cadre for the Matador training program. On 15 Nov 1949 a Matador detachment was activated at Holloman with a strength of 9 officers and 32 airmen, and by Oct 1950 the strength had risen to 17 officers and 104 airmen, when the unit was given squadron status. It later became the 6555th Guided Missile Squadron and was moved to Patrick AFB to assist in Matador activities. Virtually all training received by this pioneer unit was of the OJT type. (History of AFMTC, Jul-Dec 1951, p. 131.)

***A later tentative T/O of 13 Jul 1951 called for 27 officers and 289 airmen per unit. After it was decided to employ two guidance systems the T/O was revised to provide for 40 officers and 378 airmen. (History of AFMTC, July-Dec 1951, p. 136.)

[redacted]

The unit was to be able to assemble and check 20 missiles per 8 hour day which would be received by the squadron in eight major assembly packages. Assembled missiles could be stored, it was assumed, for one week without recheck. The firing capacity considerably exceeded the assembly rate, since each of the six firing teams the squadron would include was considered capable of launching six missiles in nine hours from one launcher. The squadron would include two guidance teams, each of which could control the missiles from three launchers.[48]

The entire program called for the activation, training, and deployment of five squadrons according to a schedule extending from January 1952 to April 1954. Each of the units was to be activated at the Long Range Proving Ground Division (after 30 June 1951 the Air Force Missile Test Center), given preliminary training there, assigned to the Tactical Air Command for unit training, and finally deployed to Europe under the control of USAFE. The basic aims of the Air Force Operating Guided Missile Program, as it was called, was to introduce the use of guided missiles into Air Force operations and at the same time ascertain the most effective way to employ them. Although the Long Range Proving Ground Division, the Air Training Command, and the Air Materiel Command were to have prominent roles in the program, the prime responsibility for it was to remain with the Tactical Air Command.[49]

The program had become even more definite by 20 June 1951, when the DCS/Operations, Headquarters, USAF, issued a more detailed directive. The Commanding General, TAC, was required to prepare a training schedule by mid-November 1951; formulate doctrine and tactics in conjunction with Headquarters, USAF, and the Commanding General, [redacted]; prepare and carry out training inspections; prepare and monitor

[redacted]

overseas movements of units; formulate with the aid of the LRPGD plans for unit training, provision of maintenance, and activation of ready units.[50]

In preparation for the assignment of giving early training to the Matador squadrons the Long Range Proving Ground Division had activated the first Air Force guided missiles training school in January 1951. As training units two guided missiles wings, the 6555th and 6556th, were established shortly thereafter. These were given on-the-job training at Patrick with the aid of the Martin Company and the Air Training Command. The first of the operational guided missile units was the 1st Pilotless Bomber Squadron, which was activated and assigned to the Air Force Missile Test Center on 1 October 1951. Intended as the first tactical squadron for the Matador missile, it was attached to the 6555th Guided Missile Wing for administration, operational control, and logistical support. In addition to its training mission the 6555th had been directed to assist the contractor (Martin) during the projected Matador research and development testing program for the period 1 June 1951 to 1 July 1952 and to conduct operational suitability tests of the missile starting immediately thereafter.[51]

The program was further increased in November 1951 to provide for nine Matador squadrons to become operational between January 1953 and June 1954. It was tentatively planned to attach each as a fourth squadron to a fighter-bomber wing and have it serviced by the same [redacted][2] In early 1952 the planning level was raised to 19 squadrons, these to be attained by the end of fiscal year 1954, but in July the number was again reduced to 9 squadrons when the Joint Chiefs of Staff approved the Air Force operational Matador program at that level. This may have reflected the somewhat erratic

[redacted]

behavior of the missile during the operational test program and the belief that its performance at best compared somewhat poorly with other missiles under development.[53]

Meanwhile, the 69th Pilotless Bomber Squadron was activated and assigned to the Air Force Missile Test Center on 10 January 1952 as the second tactical Matador squadron. It also was placed under the 6555th Guided Missile Wing for training, which was largely of the on-the-job variety. The over-all aim was to attain a level of proficiency which would permit the launching of 36 Matador missiles in any nine hour period, the assembly and checking out of 20 missiles in any eight hour period, and the maintenance of a sustaining rate of fire of 200 missiles per month.[54] By mid-1952 it had been determined that in order to maintain the above assembly rate would require five assembly lines housed in protective buildings large enough to contain three aircraft with assembly, power, and checkout equipment. It was planned that the squadron would be equipped with 40 aircraft transport dollies and 48 warhead dollies to insure the maximum rate of fire of 36 in 9 hours.[55]

Meantime, many other details in the operational concept were becoming more firmly established as the performance of the version of the missile which would go into production and the component parts of the entire system became clearer. Performance figures were now stated as follows:

maximum range	690 nautical miles
cruising speed	521 knots
maximum rate of climb	6270 feet per minute
maximum terminal velocity	Mach 1.08
average cruise altitude	40,000 feet
maximum flight time	69 minutes
terminal dive time	1 minute
climb time (35,000 feet)	12.3 minutes

It was considered that the Matador, or B-61, was suited for use

[redacted]

under five principal conditions: (1) when piloted aircraft were grounded by weather; (2) when the enemy possessed local air superiority, (3) against heavily defended targets which would exact prohibitive losses from piloted aircraft; (4) when a maximum air effort was required; (5) where it was necessary to provide a static retaliatory force in being and place. It was believed that the greatest potential of the B-61 missile system with respect to targets lay in the counter-air role, where it could be employed against enemy air bases. Because of the high cost of the system, it was believed that the use of the atomic warhead was mandatory except when none was available, its use was barred for political reasons, or the expenditure of the missile was necessary to avert abandonment to the enemy.[56]

Organizationally, the Matador squadron was to be attached as a fourth squadron to a fighter or light bomber wing, which would have both operational and administrative control. The [redacted] would supply both the bomber and Matador Squadron with atomic weapons, delivering the warhead in the nose section fully assembled and checked out. Accountability, storage, and security would be the responsibility of the wing. The Matador squadron personnel would attach the nose section (including the warhead) to the missile and give it post loading checks before launching. Maximum delivery capacity was forecast as [redacted]

Although the guidance system was still somewhat unsettled, it was tentatively planned that a combination of the MSQ-1 and APW-11 would be used to move the missiles to the battle line, although a preset heading in the directional gyro was an alternative means being considered. From the battle line to the target it was planned to employ the SHANICLE (SHORAN-Vehicle) guidance system, which had an [redacted]

[redacted]

[redacted]. This would permit massing the missiles at a particular point by flying them laterally behind the battle line and turning them over to the SHANICLE system at a specific point. Individual missiles could also be controlled the entire distance to the target through the MSQ-1 and APW-11 combination,. although this was non-directional in the reception of control information and theoretically jammable.[58]

The SHANICLE guidance system employed 4 ground stations grouped in pairs 60 miles apart, and provided fan-shaped coverage 250 miles in range and 250 miles across at the widest point. The ground components were "S" band radar stations. The airborne components were radio silent and did not provide beaconry for enemy defense. Guidance signals could only be detected by airborne "Ferret" equipment because of the line of sight course followed. The receiving antenna was directional in azimuth and elevation to the rear of the aircraft, precluding reception of jamming signals from lateral and forward directions. For these reasons, coupled with the speed of the Matador relative to potential interceptors, the system was considered invulnerable to interception until 1955, when ground-to-air missiles might change the picture. The main weakness in the guidance system lay in the necessity of 100 foot transmitting towers located close to the front and difficult to conceal.[59]

At the end of 1952 the 1st and 69th Pilotless Bomber Squadrons, Light, were said to have undergone "a detailed and comprehensive training program in ground handling and launching techniques for the Martin Matador." Both units were considered to be basically trained and had participated in launchings of the development type missile. However, due to the lack of special equipment needed to round out this training

[redacted]

it was not believed that the squadrons would be able to meet the original readiness dates of 1 January 1953. By the end of the year it was becoming clear that much of the special equipment, particularly the SHANICLE guidance equipment, could not be delivered before late spring or early summer and that a period of training of from one to three months following this would be essential. At the end of 1952 the Matador operational program had accordingly been revised as follows:[60]

Squadron	Activation	Begin Trng.	Equipped*	Op. Readiness	Deployment
1st	Oct 51	Jan 52	Nov 52 Feb 54	Jun 53	Jul 53
69th	Jan 52	Apr 52	Feb 53 Apr 54	Jul 53	Aug 53
11th	Jul 54	Aug 54	Jul 54 Nov 54	Dec 54	Jan 55
17th	Mar 55	Apr 55	Jul 55	Oct 55	Nov 55
19th	Jun 55	Aug 55	Nov 55	Feb 56	Unknown

*The first date under the fourth column shows partial equipment, with a limited stock of missiles. Deployment was to be with this. The second date shows full equipment, including two sets of guidance equipment.

The program, involving the complex problem of carrying out final development of the missile and at the same time training operational units, continued to run into difficulties during 1953. These made it impossible not only to hold to the above schedule, but forced a reduction in the planned operational program late in the year. The developmental problems will be left for more detailed consideration in Volume V of this history and will only be summarized here. Possibly the most serious of these revolved around the tendency of the missile to break

This problem was successfully dealt with in August 1953 by

Another problem area, as in most guided missile programs, lay in the selection and production of a suitable guidance system. As previously seen, it had been planned to equip the Matador with a combined AN/MSQ-1-AN/APW-11 system, having an effective range of 250 miles, for traffic control, emergency control, and close-in targets. It was also planned to use the more advanced SHANICLE system for control of the missile after having passed the battle line. Early in 1953 Martin began experiments with the SHANICLE system as applied to the Matador, but it soon became apparent that this guidance system was still in the development stage and would not be available in the near future. Though it was obviously promising, deployment with the existing two squadrons was out of the question. During 1952 the AN/MSQ-1-AN/APW-11 system was somewhat elaborated into an improved version designated the MARC system, employing additional components to permit closer tracking and closer control of direction and dump point. The first successful flight utilizing the MARC system was made by a B-61A on 1 April 1953. The major development efforts at this time were directed toward the improvement of SHANICLE guidance, development of the arming and monitoring system, tactical orientation studies for SHANICLE and MARC guidance, and the improvement of miscellaneous components. Estimates of the reliability of the MARC system during early 1953 ranged from 25 to 50 per cent.[62]

Pressure came from Headquarters, USAF, early in 1953 to demonstrate an immediate capability, particularly through firing of 10 Matadors for record, employing a minimum weapons system. This was opposed, however, by the AFMTC on the ground that it would disrupt the developmental program. It was argued that the [redacted] problem alone made

it impracticable. To resolve this and other conflicts, the somewhat confused program was analyzed at a major conference in April 1953 attended by representatives of Headquarters and the various concerned commands. At that time it was agreed that the B-61 weapons system would have to be divided into two phases if any early capability was to be achieved. Phase A would be the development of an interim system employing AN/MSQ-1-AN/APW-11 guidance capable of going from the take-off point to the impact point intact while carrying a special warhead. Achievement of this objective by the earliest possible date was assigned first priority, since on it would hinge the reaching of any early capability and deployment of the existing two guided missile squadrons. Phase B would consist of the development of the weapons system as presently outlined in military characteristics using SHANICLE guidance in addition to the interim system. Refinements such as additional range, new techniques of operation, and desired characteristics were to be left for later consideration.[63]

As previously noted, the difficulties were successfully dealt with by August 1953. Meanwhile, the training and equipping of the two pilotless bomb squadrons had been continuing during the first half of the year. By June it had become apparent that the squadrons could not be made ready for the scheduled July 1953 deployment even if operational missiles had been available. The 1st PBS had received only slightly more than half of its scheduled equipment, and the 69th was in considerably worse shape. Much of the equipment received had been lent to the Martin field test crew, and the lack of critical guidance and tracking equipment made it impossible to complete field training. Furthermore, 31 percent of the 457 men of the 1st PBS were declared ineligible for overseas deployment along with

35 percent of the 69th PBS. In April 1953 the first military warhead training unit had begun training in a special class, but this was discontinued for shortage of equipment.[50]

Solution of the problem made possible a re-examination of the Matador program in September 1953, and a conference at Patrick reached a number of important conclusions and formulated new recommendations to Headquarters USAF. At the conference it was pointed out that about four months of research and development were needed to improve the performance of the B-61A, which the Missile Test Center considered sound and certain to improve rapidly. The AN/MSQ-1 AN/APW-11 system was said to have been shown to exert positive control and was considered capable of a circular error applicable of

Meanwhile, the SHANICLE guidance system, which had been deleted from the B-61A, was being redesigned and redeveloped, and was expected to be ready by the summer of 1954.[69]

The development of the warhead was reported to be essentially complete except for flight tests, as was the adaption kit. It was estimated that the first production adaption kits, quantitative requirements for which had just been approved by the JCS, would be available in about nine months and the first production warheads (actually the bomb to missile warhead conversion components) about three months afterward.

A great amount of uncertainty revolved around the immediate future of the two guided missile squadrons which had been activated and the three others which had been programmed. The Tactical Air Command urged

deferring the activation of the 11th, 17th and 19th PBS until better missiles were available. It also argued that even if the B-61 proved completely successful, there were probably not enough targets within its range in Europe to justify the program as established and that even two squadrons with atomic warheads might be excessive. It proposed that funds and effort programmed for the B-61A be divided to expedite the development of a more desirable system, such as the B-61B. The TAC desired an improved system having 1,000 miles range, accuracy equal to a piloted aircraft, and a self-contained guidance system requiring no ground stations. At this time a target study by Supreme Headquarters, Allied Powers Europe, was under way and force requirements were being studied by USAFE.[67]

Various problems also made the future of the two active squadrons somewhat problematical. Shortage of equipment had made it impossible to establish any high degree of proficiency; however, the USAFE stated a willingness to accept the first squadron with a minimum of 12 missiles, a demonstrated accuracy of [redacted] had been established. A new Table of Organization and Equipment was being considered on the recommendation of the TAC, but the ARDC stated that it would be impossible to man it for the current squadrons within the immediate future. It also appeared that if the 1st PBS were not deployed by March 1954 the retainability of personnel, based on a 12 months' retainability period would drop below an acceptable figure. The ARDC desired to transfer the squadron to the TAC on 1 November 1953, with deployment following between January and March 1954, but the TAC contended that with the weapon unproved the earliest practicable deployment date was May 1954.[68]

Agreement was reached at the conference on nearly all points

[redacted]

considered, and fifteen recommendations regarding the program were made to Headquarters, USAF, among which were the following:[69]

1. that the 1st and 69th PBS be transferred to the TAC on 15 January 1954, but that they remain at Patrick pending deployment to support operational suitability tests;
2. that the 1st PBS be deployed to Europe no later than 15-20 May 1954, provided the OST indicated the missile was acceptable, but that the deployment of the 69th be indefinitely deferred;
3. that the Air Training Command initiate training of replacements for the two B-61A squadrons immediately, but that activation of the 11th, 17th, and 19th PBS's be deferred pending study of the B-61A force requirements for Europe;
4. that Headquarters, USAF, state a requirement to the Atomic Energy Commission for B-61A warhead production based on complete design release before 1 March 1954, preproduction training items 1 July 1954, and the first production item 1 September 1954.

The above recommendations were approved in essence by Headquarters, USAF, except that the scheduled deployment date was moved up to 15 March 1954. The Missile Test Center pushed rapidly ahead on the training of the 1st PBS, which it declared concluded on 15 December 1953. As a final exercise the squadron fired B-61A missiles within a period, of which four went into the impact area. This was considerably below the operational rate goal of , but was regarded as satisfactory and did represent a new record. The squadron was brought up to a sufficiently high manning status for overseas movement through transfers from the 60th PBS and 6555th Guided Missiles Group. It was impossible, however, to complete the four main training objectives which had been set up in September 1953.[70]

The Matador Warhead Program

Concurrently with the training of the operational squadrons and the development of an operational missile, a development program was being carried out by the AEC directed toward the production of the components necessary to adapt an atomic bomb for use as a missile warhead. This had officially got under way in February 1950 following a review of the military services' missiles programs in which four missiles were endorsed by the JCS as atomic weapons carriers, including two Air Force—Rascal and Snark. The list was revised several times during 1950 and 1951, in the course of which two other Air Force missiles—Matador and Navaho—were added. In July 1950 the requirement for atomic warheads for missiles placed on the Atomic Energy Commission was made more specific by the designation of four types—based on the (TX-10), the (TX-8), the TX-5, and the Mark 6—to be developed as atomic warheads.[71]

To cope with the complex matter of developing atomic warheads which would be usable in a variety of missiles under development by the three Services, an arrangement was established at the behest of the Department of Defense in late 1950 under which the AFSWP became the coordinating center to initiate requirements, coordinate them with the services, and submit them to the Sandia Weapons Development Board, which would decide as to the particular agency or contractor to carry on the actual development work. It was provided, however, that the AEC would budget for the development of the warheads already programmed for. This arrangement, agreed to by the AEC in January 1951, prevailed throughout 1951. Under this system the AFSWP prepared and the Military Liaison Committee transmitted to the AEC in July 1951 detailed military characteristics for the first atomic warhead, item

derived from the TX-5 which would be suitable for seven missiles including Matador and Rascal.[72] By December 1951 a full scale fitting of the warhead in a mock-up of the Matador was reported ready to be carried out at Sandia Base and programs were being set up for the design of the fuzing and firing mechanisms.[73]

During 1952 many of the parameters of the problem of adapting atomic weapons for use as warheads for guided missiles became clearer. It was seen that the warhead and related components could be broken down for the purposes of development and logistics into three groups of items. These consisted of (1) parts consisting of the

ables, power

supply, and similar items); (3) specific items which were required to fuze and adapt a particular warhead to a particular missile. The MLC reached agreement with the AEC on the use of three terms--warhead, warhead installation, and adaption kit. The warhead would include the essential elements of the bomb except for the power supply, the derivation of the arming and firing signals, and the special hardware needed for mounting. The warhead installation would consist of all the above items. The adaption kit would consist of items peculiar to the installation less the warhead, including the arming and fuzing systems and power supply. The designation plus a number would be used for the missile warheads. Later two other terms were agreed on--bomb to missile warhead conversion components (BMW-CC's), those components necessary to convert a given bomb into a given missile warhead, and missile warhead to bomb conversion components (MWB-CC's), these components necessary to convert a given missile warhead into a bomb. These terms resulted from the emergence of the concept that the

essential heart of the bomb and missile warhead should be readily convertible for the other purpose.[74]

Three important points of policy in regard to guided missiles also became established during 1952 and early 1953 as a result of agreements between the DOD and AEC. First, the principle of the interchangeability of the atomic bomb and guided missile warhead was established. Second, adaption kits were to be stored with the missile and not given the special treatment provided for the non-nuclear components of atomic bombs. Third, the military services would by 1 July 1954 assume both development and procurement responsibility for adaption kits, including the fuzing and firing components. This would not, however, affect the development and production of warheads and adaption kits for the early missiles, including Matador, by the AEC.[75]

By the end of 1953 firm agreements had been reached between the AEC and DOD in regard to a number of important guided missile policy matters. (1) The DOD would assume fiscal responsibility for new designs, and beginning 1 July 1954, for all military production, while the AEC would retain responsibility for interim fuzing, as in the case of the Matador warhead and adaption kit. (2) The same arrangement would apply for development responsibility. (3) The DOD would assume procurement responsibility for all adaption kits starting 1 July 1954, using the AEC as the source. (4) Requirements for production after 30 June 1954 were to be coordinated through the AFSWP. (5) The AEC was to have fiscal, developmental, and production responsibility for the development of

[redacted]

The above agreement did not apply to the Matador, at least in its B-61A form. The AEC had already developed the atomic warhead to the

point that it was ready for flight testing by December 1953, when the Air Force Missile Test Center carried out the first successful warhead system test for XW-5. This [ ] warhead was basically similar to the Mark 5 bomb, except for the absence of airfoils and casing, modification to withstand higher accelerations, and a different [

Interim requirements for warheads for Matador and other missiles were stated by the JCS to the AEC on 12 August 1952. At this time Matador XW-5 units were expected to be available from the AEC by early 1954.[78] On 13 May 1953 the JCS stated requirements for adaption kits and bomb to missile warhead conversion components beginning 30 June 1954. It pointed out, however, that no stockpile of ready missile warheads would be established until some time after 1 July 1956.[79]

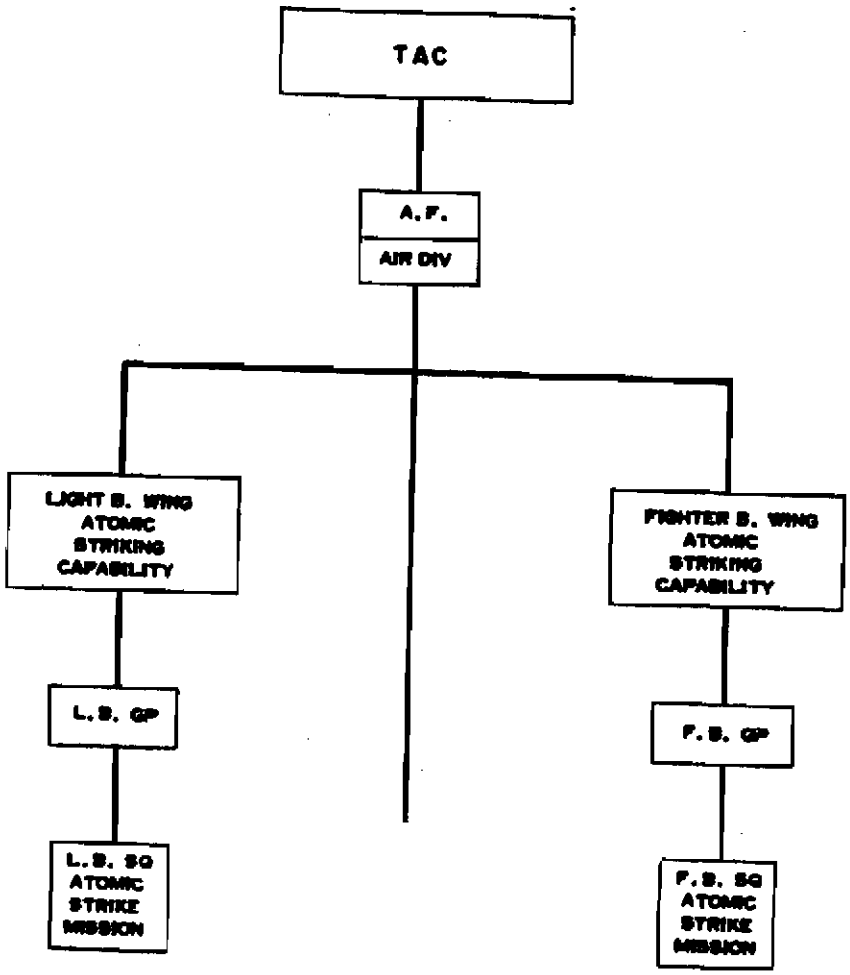
The warhead development program for the B-61A, centering around the was thrown into confusion in early 1953 by the failure of seven successive warhead system tests as the result of the malfunction of the missile. All such tests were postponed until a missile flight had succeeded, which ultimately meant approximately a six months delay. Entry of the warhead into the stockpile, originally planned for early 1954, was then indefinitely postponed. It was clear by the end of 1953 that the first Matador squadrons would deploy to Europe with the missiles but without adaption kits. In the case of the B-61A these would be stored with the warhead rather than the missile, along with the bomb to missile warhead conversion components. The B-61A would thus have at the beginning no atomic capability. Late in 1953 the number of adaption kits to be ordered remained in some doubt. Two unsettled points were the questions of whether every B-61A programmed should have an atomic capability and whether a one to one ratio between

adaption kits (which could be used only with one type of missile) and bomb to missile warhead conversion components was necessary or desirable.[80] The basic problems of the B-61A's atomic capability were considered, however, to be solved, and on 3 November 1953 AFOAT marked this by announcing its withdrawal from the practice of taking direct actions in this matter in the belief that further activities could best be controlled by normal staff action.[81]

Logistic Support for Tactical Atomic Operations

It was obvious from the beginning that the supply of tactical air striking units with atomic weapons would present somewhat different problems from those faced in the supply of strategic units, and this problem was taken up by the Tactical Air Command near the beginning of the program. The proposal developed by the TAC in the fall of 1950 called for a somewhat more integrated atomic weapons support system than that used by the SAC. The TAC planners suggested that a special air transportable unit, first called [redacted] be established, preferably with its own integral aircraft. The unit, emphasizing the mobility, flexibility, and celerity characteristic of tactical air operations, would perform such functions as storage, surveillance, assembly, and test of atomic bombs and missile warheads; delivery of ready bombs and warheads to tactical wings and missile squadrons; replacement of deadline weapons and components at wing bases; field rejuvenation and restoration of deadlined weapons to operational condition; maintenance of accountability, expenditure, and status records on atomic bombs, warheads, and ancillary equipment; protecting the security of such items in area storage or in transit; giving technical training to bomb commanders and other personnel in areas serviced. It would

NOMINAL TACTICAL ATOMIC AIR FORCE



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be capable of maintaining up to) atomic weapons completely ready except for . and would be able to produce completely assembled weapons from this semi-ready condition and to load . It would have a normal personnel strength of 24 officers and 184 airmen, of whom 5 officers and 92 airmen would be assigned to security duty.[82]

Under the operational concept the unit would preferably be located adjacent to a tactical bomber force base, but relatively near the tactical air command headquarters to permit control to remain with headquarters. would completely service the combat wings of one or more tactical air forces or tactical bomber forces with atomic bombs, warheads, and ancillary equipment, drawing on theater storage sites as a direct source of supply. DCS/Operations in Headquarters, USAF, supported a somewhat different concept more closely resembling the system employed by the SAC, with providing issue of ready bombs, including loading and post-loading check, and the providing major storage, assembly, and other types of longer term maintenance. The concept proposed by the TAC was, however, adopted in August 1951 except for the integral aircraft.[83]

The was activated on 31 August 1951, and was essentially drawn from personnel and applicable equipment of the deactivated After unit training at Sandia Base beginning in December 1951 it was transferred to the TAC, placed under the 49th Air Division, and deployed to Europe with that organization in the late spring of 1952. It was required to maintain atomic bombs; sustain a normal delivery rate of from the ready condition; and as a maximum

effort after

It was planned that depot support for Class equipment other than complete weapons would be provided for th

Depot support for complete weapons would be provided from national stockpile sites in the United States until such time as an AFDS could be activated, trained, and deployed.[84]

The above atomic weapons logistic organization and its associated supply system had already come under attack as being unwieldy, wasteful of personnel, and unsuited to the support of delivery operations from widely dispersed bases. At a conference in November 1952 of

representatives of the TAC, AMC, SAC, USAFE, and Headquarters USAF, a new logistics system was worked out. Basic elements in this would be containing ready weapons each and including a number of 6 man s assigned to delivery units. The would be capable of storing, handling, and processing to operational condition bombs. All assembly and surveillance would be conducted at , to which weapons would be shipped in ready condition from the Zone of Interior by airlift.[87]

After numerous modifications the plan was accepted by the Tactical Air Command in August 1953 and approved by Headquarters USAF, in October. Acceptance of the cellular concept and establishment of the revised system was expected to allow greater dispersion in weapons storage, provide the flexibility essential for varied theater requirements, and bring about an integration of all special weapons functions, including the supply of ,, in one organization. Essentially, the plan called for the establishment of two echelons, with most services concentrated in the first, to replace three echelons. The theater type o wings would be replaced by a new unit, the and a small special weapons personnel wing augmentation. The tactical atomic wing, augmented by four specially trained officers and two airmen, would receive ready weapons and nuclear components at the strike base, perform necessary tests, , load the weapons into the aircraft, and deliver them on the targets. Weapons would be retained at a strike base up to . If longer, a of one officer and 11 airmen drawn from the would be attached to the wing. This unit could maintain

indefinitely up to weapons.[88]

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87. R&R, AFOAT to DCS/C, sub: Special Weapons Cells for Support of Tactical Atomic Forces, 10 Aug 1953.

88. History of TAC, July-Dec 1953, Vol. VII, p. 10-23.

89. Ibid.

Chapter VI

THE INFLUENCE OF ATOMIC WEAPONS ON AIR DEFENSE

The Threat of Soviet Atomic Attack

During the period 1949-1953 the threat of Soviet atomic attack became real if not immediate. The time cushion which had existed in 1945 was used up with unexpected rapidity with the development of nuclear explosives by Russia in almost exactly four years after the surrender of the Japanese. During the same period the Russians successfully copied the B-29 and began production on their first true long range bomber--the TU-4. Meanwhile, post-war efforts in the United Nations to establish a system of control for atomic weapons failed completely, and the Soviet leaders made manifest their aggressive intentions through political and military moves in the Balkans, Central Europe, and the Far East.

A general pessimism prevailed during the early post-war period in nearly all military air circles regarding the possibility of successful defense against atomic attack. The opinion was widely expressed by such varied groups as the Evaluation Board for Operation CROSSROADS, the Joint Strategic Survey Committee, and Rand that no effective defense per se could be established and that the best hope for a de facto defense lay in the creation of a powerful striking force as a deterrent and the building of an intelligence system of unprecedented effectiveness.* Acting on these conclusions, the Air Force bent its major effort from 1946 to 1948 toward the improvement of its strategic atomic striking capability. Along with this, as agent for an interservice

*See Volume II, Chapter 9A.

effort, it established a detection system which brought timely warning of the first Russian atomic blast.

Although the prospect of establishing any effective conventional defense was admittedly discouraging, the effort was by no means abandoned. It was pointed out, however, that such a defense would probably have to be limited to the most vital potential targets, such as the operational bases of the Strategic Air Command and key urban concentrations. The importance of applying intensive and coordinated research and development to the air defense problem was also repeatedly emphasized. The dilemma faced was that any air defense system worthy of the name would be enormously expensive at a time that military expenses were being rigidly curtailed and that even the most effective system possible might be rendered obsolete by the development of long range ballistic missiles modeled after the German V-2.

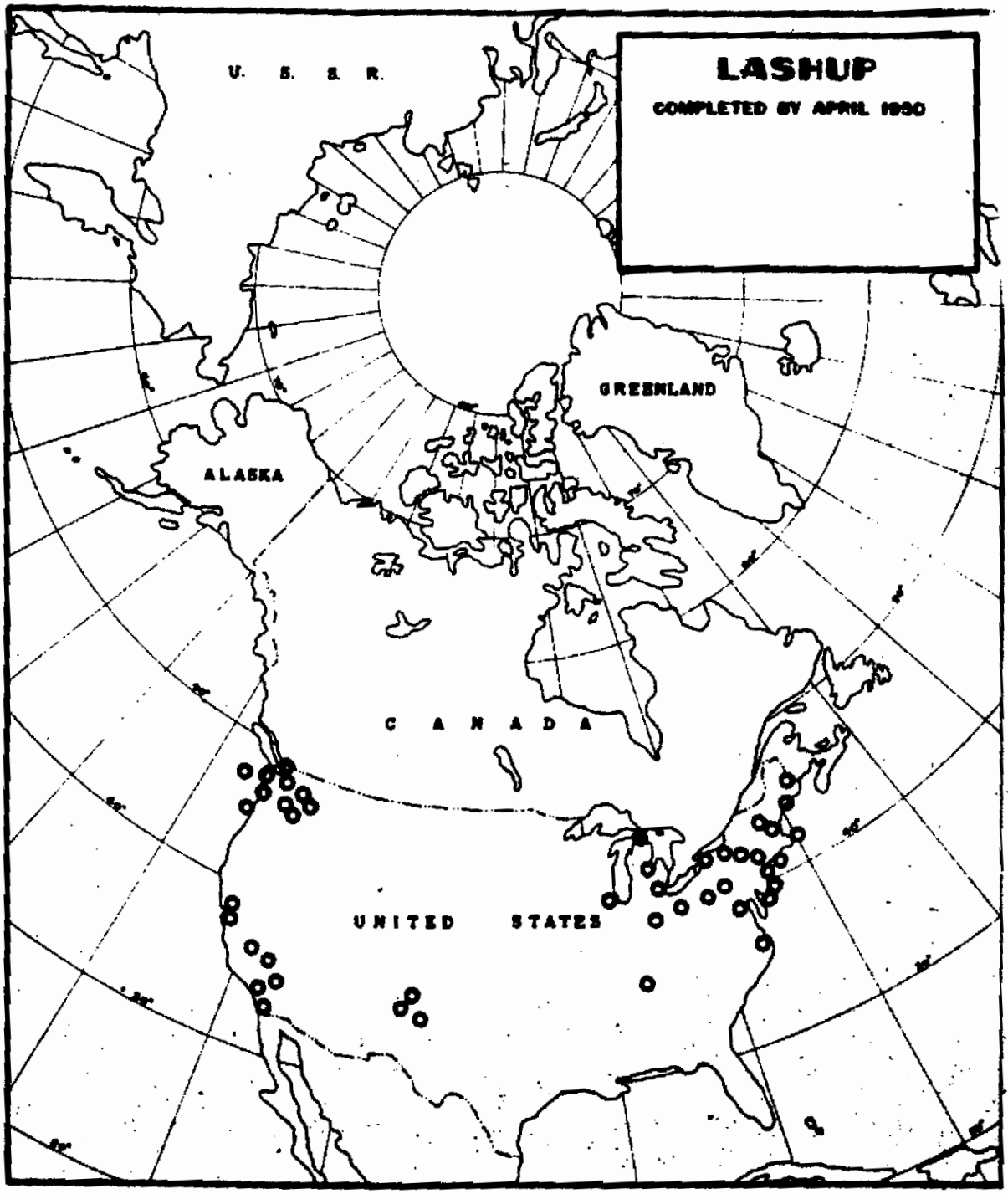
Nevertheless, late in 1947 the Chief of Staff, USAF, approved a plan for an extensive aircraft control and warning system known as Plan SUPREMACY which was designed to provide the framework for a functioning air defense system. Congress failed to act on legislation providing for the system, but a severely reduced form known as the Interim Program was approved by the JCS and Secretary of Defense in late 1948, and then by Congress on 30 March 1949. Meanwhile, work was actually begun late in 1948 on a temporary system employing obsolescent available equipment known as LASHUP. The work which had begun was supposedly to lead in 1952 to the establishment of the so-called Permanent System.*

LASHUP became gradually operational during 1949 and continued to form the principal part of the warning system until 1951. By March

*See Volume II, Chapter 9B.

[redacted]

START OF AN ACTIVE AIR DEFENSE SYSTEM



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1950 the system consisted of 42 sites, at which time construction work began on the Permanent System. At that time the phase-out of LASHUP began and continued until 1952 as the Permanent System, consisting in its first form of 75 sites and 11 control systems, was established. During 1951 the Air Force decided to supplement this system with 44 mobile sets of equipment, largely intended for strengthening the defense of SAC bases and certain soft spots in the system. In the same year a defense agreement was concluded with Canada which included provision for the construction in that country of 35 new installations.[1] These became the basis for what was to be known as the Pine Tree Line, the first northward extension of the original Plan SUPREMACY.

Although progress had been slow, it had undoubtedly been accelerated by the unexpectedly early development by Russia of the atomic bomb and the persistently aggressive international actions of that nation culminating in the outbreak of the Korean War. This was coupled with the implicit assumption that atomic air attack was the most direct threat to this nation's well being and existence. As will be seen in Chapter 7 of this volume, the national strategic policy and plans were reexamined at NSC level early in 1950 as the direct result of the first Russian detonation, and it was concluded in

were necessary. This was followed by repeated studies within Air Intelligence and the JCS as to the exact extent of the Russian threat projected at various times in the future. In August 1950 Air Intelligence concluded that the Russians were already to mount a considerable attack on parts of the United States and that by 1952 the entire country would be within range of an atomic attack by a force of up to 2000 aircraft. It also foresaw the possibility of an attack

at the same time by missile carrying aircraft or submarines.* In the fall of the same year the Weapon Systems Evaluation Group of the Department of Defense completed a report on the first phase of a broad study of the air defense problem in which it concluded that the air defense system in being was totally inadequate and that the completion of the projected system in July 1952 would not materially alter the situation. Acting from similar conclusions on 5 December 1950, the Chief of Staff, USAF, requested the Massachusetts Institute of Technology to establish a laboratory to give intensive study to air defense problems, and representatives of that institution met with a Joint Scientific Advisory Committee from the three services on 19 January 1951 to plan a program of action.[2] This program, based on studies already made by the Air Defense System Engineering Committee of the USAF Scientific Advisory Board, was to lead into recommendations which would have great influence on the air defense system after 1953 and which will be later discussed in this chapter.

New Measures to Strengthen Air Defense, 1951-1953

In addition to the previously mentioned work on the aircraft warning system, various other concrete actions were taken during 1951, 1952 and 1953 to improve the air defense capability of the nation against the materializing Russian air atomic threat. Organizationally, the Air Defense Command was given an independent status in January 1951. Its strength was also rapidly stepped up from 8 wings and 10 squadrons in early 1949 to 45 squadrons, deployed on 39 bases, in June 1951. The figures are delusive, however, since most of these units were both understrength and equipped with obsolescent aircraft.[3]

*See below, Chapter 7A.

The development and production was pushed of improved interceptors—such as the F-94, F-86D, and F-89—which could more fully utilize the new air defense control systems. Use began of the F-89, the first all-weather jet interceptor designed specifically for its mission, including provision for very elaborate radar control, detection, and firing equipment and for guided air-to-air missiles as armament. Over the longer term, however, it was believed that no piloted interceptor would be adequate, and increasing attention was given to the development of ground to air missiles.*

Despite the improving air defense system, the problem of air defense promised soon to become more critical. It was freely pointed out that the existing planning, including all proposed extensions, would provide only for a system which would become increasingly ineffective after 1956 and might be completely devaluated with the advent of a successful Soviet long range ballistic missile after 1960. Even before this a tremendous increase in efficiency would be desirable because of the damage even a few bombers might do with the rapidly increasing power of the newer types of atomic bombs.

In this situation the nation's military leaders cast about for new means, both interim and long term, to strengthen air defense.

This

*See below, Chapter 8C.

objective, known as BRAVO, continued to hold first priority during the next few years and represented the hope that any

Unfortunately, to assure the success of this plan the SAC itself would have to be assured time to load and take off. The problem thus tended to return to its first form of constructing a highly efficient warning system.

During the period from 1950 to 1953 plans were proposed and in part approved to improve the intermediate term capability of the aircraft warning and control system by extending it in various ways, notably through the construction of the Southern Canada, or Pine Tree Line; the McGill, or Mid-Canada Line;* and the Northern Canadian, or Distant Early Warning (DEW) Line.[5] The latter was first specifically proposed by the Lincoln Laboratory Summer Study Group in 1952. Although the concept was approved by the National Security Council in late 1952, the exact requirements were still under study at the end of 1953. Representing a considerable extension of the early warning concept, this plan called for the placement of radar installations along the top reaches of the North American Continent, along the western Coast of Greenland, and at various points in the Pacific and Atlantic Oceans. At points where no islands existed, coverage would be provided by picket ships or aircraft equipped with radar. The Pine Tree Line represented a logical extension of the SUPREMACY radar net plan into Canada with the consent and cooperation of that nation. The McGill Line, consisting of small radars placed about 400 miles farther north in an east-west direction along the fifty-fifth parallel, was proposed by the Canadians themselves and was to be built by them with United States support.

*This was also known as the Southern Canadian Early Warning Line.

Both 1952 and 1953 were important with regard to high level activity in planning and initiating the first stages of action to greatly extend and improve the air defense system. After a series of studies, NSC 139, 31 December 1952, had set forth a definite policy on air defense by requiring (a) the effectuation of planning for an effective system of air, land, and sea defenses for the continental United States, this system to be ready no later than 31 December 1955 and to include well organized programs of civilian defense, industrial security, and plans for the rapid rehabilitation of vital facilities; and (b) the development and installation by the Department of Defense of an extended early warning system capable of providing three to six hours warning of aircraft approaching the United States from any likely direction of attack, with as much as possible of the system to be in operation by 31 December 1954 and the remainder by December 1955. The Secretary of Defense directed implementing action on 12 January 1953 and on 19 January assigned the immediate program in support of (b), designated Project COUNTERCHANGE,* to the Air Force.[6] This was to be essentially a combined feasibility and developmental study designed to evaluate the proposed DEW Line and determine what types and quantities of equipment would be required for it as well as other operational requirements.**

*This was later changed to Project CORRODE and then Project 572. (Report by Continental U. S. Defense Planning Group to the JCS, 29 Jan 1954, in JCS 1899/102.)

**Actually, several factors left an early construction of the Line in doubt. The Air Force and Department of Defense opposed construction of the Line on a crash basis, fearing an adverse effect on other phases of national defense. The new administration was emphasizing the need to reduce defense costs and a policy of "massive retaliation." The cost of constructing and maintaining the Line were undetermined, but certain to be very high. Nevertheless, the go-ahead was finally given in February 1954, with the Line to be completed by mid-1957.

During 1953 the air defense system was repeatedly reexamined at various levels of national defense. On 11 March the Air Force was directed by the JCS to prepare and submit a comprehensive plan for the defense of the continental United States against air attack and this was presented for JCS approval on 13 June as Objectives Plan for the Defense of the Continental United States.[7] Simultaneously two important high level ad hoc committees were examining the air defense problem. The Ad Hoc Study Group on Continental Defense, (Kelly Committee) appointed by outgoing Secretary of Defense Robert A. Lovett in December 1952, was headed by Dr. Mervin J. Kelly, President of the Bell Telephone Laboratories, and consisted of industrial executives, engineers, scientists, and representatives of the military services. In a report rendered to the Secretary of Defense in May 1953 the Committee emphasized the importance of early warning as the first essential of an effective air defense system and of an active civil defense system and estimated the cost of implementation as 20 to 25 billion dollars to be spent over a 6 year period.[8] The new Secretary of Defense, Charles E. Wilson, had also appointed an ad hoc committee with similar objectives, the Continental Defense (Bull) Committee, which was headed by Lt. Gen. Harold Bull, U. S. Army Retired, and consisted of officers from the various military services. Its report, rendered to the National Security Council in August 1953, took a somewhat different stand, laying less emphasis on the importance of early warning, but also advocated an extensive program involving the expenditure of from 18 to 26 billion dollars over a period of 6 years.[9] In addition there were numerous reports on more limited aspects of the national defense problem.

Although it is not the function of this history to examine these

reports and the decisions based on them in detail,* it may be noted that an important factor influencing them was the increasing realization of the rapidity of Russian progress in atomic matters, as signalized in particular by

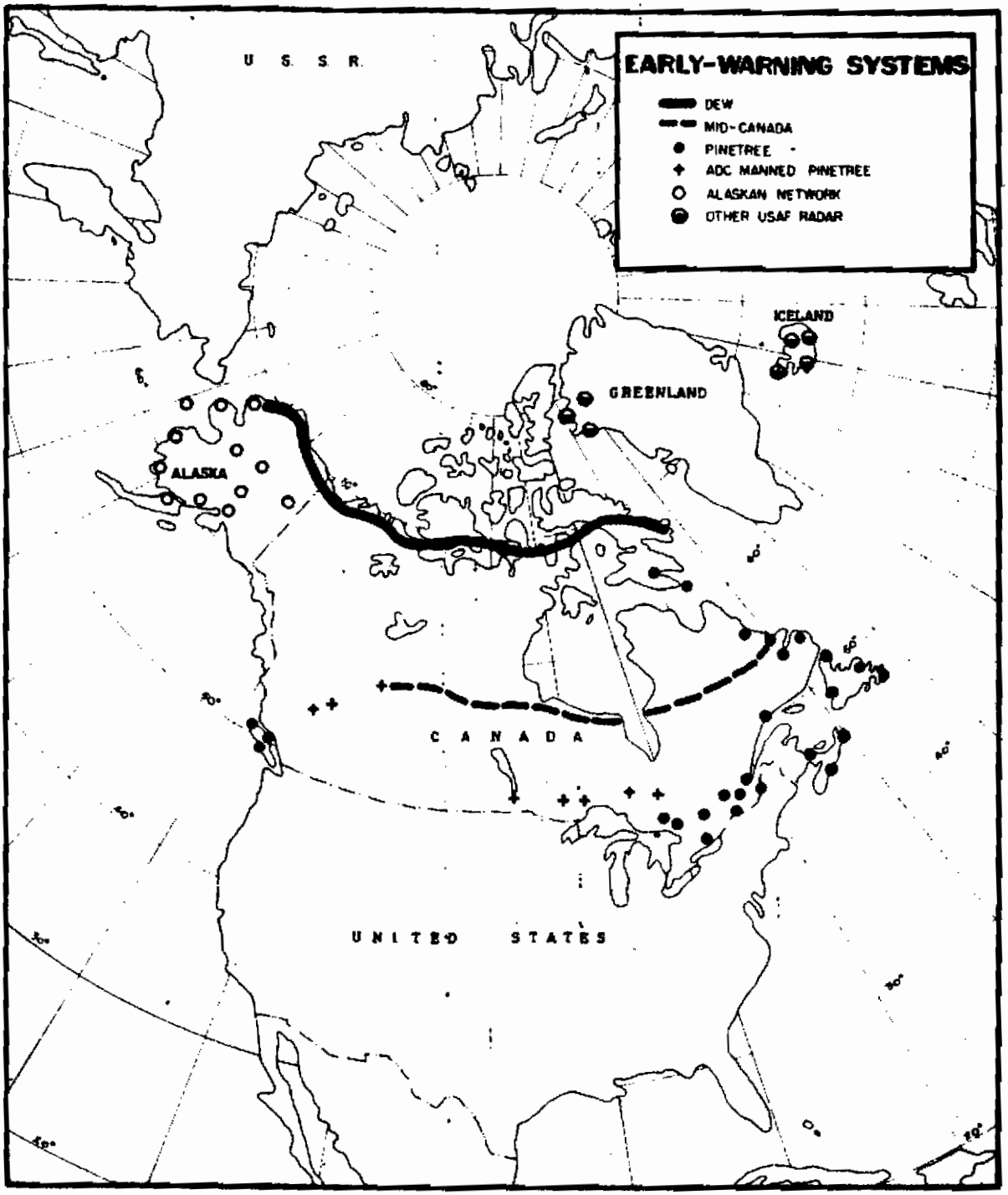
A number of high level actions affecting Continental air defense followed in late 1953 and early 1954. The Joint Chiefs concurred with the conclusions of the Continental Defense (Bull) Committee in August, and the President approved these on 25 September 1953 in NSC 159/4, subject to the submission before 15 November 1953 of a more precise definition by the Department of Defense of the phasing effort and of the costs of various parts of the program.[10] General Nathan F. Twining, Chief of Staff, USAF, and Admiral Robert B. Carney, Chief of Naval Operations, reached a preliminary agreement clarifying the knotty question of seaward extension of the early warning system, and the Joint Chiefs approved a memorandum report to the President on 21 November 1953 which set forth in more definite form numerous extensions and improvements in the air defense system.[11] This included provision for full implementation of the Southern Canadian Early Warning (McGill) Line, including seaward extensions and gap filler radars. By the end of the year it was estimated that this could be partly operational in fiscal 1956 and fully in fiscal 1957. It did not include final provision for the Northern Canadian Early Warning, or DEW Line, which was still being studied at the end of 1953.[12]

Further broad measures were to be taken in 1954. By January both

*For a more detailed treatment see USAF Historical Study No. 126, The Development of Continental Air Defense to 1 September 1954, USAF Historical Division, 1958.

[redacted]

EXPANDING THE INTERIM AIR DEFENSE SYSTEM



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Admiral Arthur W. Radford, Chairman of the Joint Chiefs, and General Twining were of the opinion that a complete reorganization of continental air defense was desirable, in particular that the unified command already approved in principle by the JCS should be promptly established.[13] This was ultimately carried out on 1 September of the same year. On 2 February 1954 continental defense policy was again restated in NSC 5408.[14] This reiterated the requirement for the construction of the DEW Line, provided its feasibility was established by Project CORRODE.

Despite the various concrete measures taken, it is obvious that Air Force planners considered that air defense against Soviet atomic attack remained an unresolved question which was at the same time the most difficult responsibility assigned to the Air Force, if not to the military forces of the nation. It was also a problem which would become continually more formidable as nuclear weapons and their carriers improved in quality and quantity. This, as will be seen later in this chapter, had already led to consideration of turning atomic weapons themselves against invading air forces and also to an organized scientific effort of great scope to assure their effective use.

Development of New Techniques

At the end of the war the problem of air defense against atomic attack, although not immediate in nature, seemed so staggering that only two concrete proposals were heard. One, advanced in the Spaatz Board Report of October 1945, was that an improved aircraft warning and interceptor control system basically similar to that developed by the British early in World War II be established.* This was eventually

*See Volume II, Chapter 1A and 9A.

begun in 1948 and had reached a considerable degree of progress by 1952, as pointed out above. Unfortunately, serious inherent defects existed which would make the system only partially effective against bombers of high performance and over the longer term with the increased weapons yields and the use of supersonic guided missiles it might become almost useless.[15]

The second proposal, stressed in the Report to the JCS of the Evaluation Board for Operation Crossroads, was that the/

In this situation the Air Force turned for aid to the policy established immediately following the war of attacking development problems in direct partnership with the basic scientific resources of the nation. This policy had included the creation of a special contract organization, Rand, for the purpose of properly planning and controlling such efforts. As seen in Volume II, Rand was first assigned the air defense problem in December 1946 and made preliminary reports in July 1947 and February 1948 (RA-15038 and RM-28) which have been summarized.*** These stressed the need for high priority research on new

*See Volume II, Chapter 9A.

**See below, Chapter 7H.

***See Volume II, Chapter 9A.

techniques and systems for air defense, but also concluded that funds spent on a first-class intelligence system might buy more defense per dollar than any other.

Rand continued to work on the air defense problem, completing its first major study on the subject in October 1951.[16] As the 1951 study itself pointed out, it had little to add to the conclusions already reached regarding air defense by preceding and collateral studies. Confining itself primarily to the 1952-1953 period, the 1951 study concluded that the potential enemy, Russia, could by the latter year mount an attack by between 100 and 500 TU-4 bombers carrying about 100 atomic bombs. It estimated that if unchecked, these could destroy various selected critical target systems of five to ten million homes in urban areas. The study also analyzed the programmed air defense system which would presumably exist by 1953 and found it inadequate in five areas: (1) radar coverage and data handling facilities, (2) identification procedures and rules of engagement, (3) defense against low attack, (4) total defense strength, (5) defense weapon effectiveness against advanced types of enemy threats. Specific recommendations were made for improvement in each of these areas. Although little consideration was given to more advanced threats for the period after 1953, it was pointed out that the electronic warning and control system must lay the basis for the detection of and vectoring of weapons against the enemy supersonic missiles, both air and ground launched, which must be ultimately expected. The types of area-defense and local defense missiles which would presumably be employed against these were also generally described.[17]

Meanwhile, working from another direction on the same general problem, the Air Force Scientific Advisory Board recommended and the

Chief of Staff approved a proposal for the formation of an Air Defense System Engineering Committee, which was established in January 1950 and generally known as ADSEC, or the Valley Committee, after its chairman. The Committee submitted two reports during 1950, recommending the carrying out of several specific development projects, including the development of a special digital computer for air defense data analysis and the study of ground wave radar techniques and equipment for low altitude detection. Meanwhile, the air defense problem was further emphasized in late 1950 in a report of the Weapons System Evaluation Group, which concluded (a) that the air defense system then in being was totally inadequate and (b) that completion of the currently programmed system in 1952 would not materially improve this situation.[18]

The work begun by ADSEC was with little delay taken up early in 1951 by a more permanent group, Project LINCOLN, which functioned as a contract activity set up by the Massachusetts Institute of Technology at Air Force request and with the approval of a joint Scientific Advisory Committee which included Army and Navy representation. Three phases were actually involved—(1) Project CHARLES, a short term interservice study project to develop the main guidelines, (2) implementation of the ADSEC recommendations, (3) establishment of a new air defense laboratory to continue the work thus begun. Responsibility for the administration and support of Project LINCOLN was assigned in August 1951 to the Air Research and Development Command, which subdelegated this to the Cambridge Research Center. The project was established along the lines recommended by Project CHARLES, including provision for an interservice advisory committee.[19]

The year 1951 was primarily devoted to planning, but the project was in full swing during 1952, when the priority was raised to 1A and

large funds were channeled to the project's activities. One of the principal objectives was the establishment of an experimental radar network known as the Cape Cod System. Much attention was also given to the development of an improved digital computer for data analysis known as the Whirlwind II and to the development of other improved elements for a semi-automatic warning system. During the summer of 1952 a number of scientists known as the Summer Study Group were assembled to review the overall problem of the evolution and further development of the Continental air defense system. Three principal problems were considered—(1) the establishment and operation of an early warning system giving three to six hours notice of the approach of winged aircraft, (2) the establishment of an interception force capable of making full use of this warning, and (3) defense against intercontinental ballistic missiles. A principal recommendation called for the expedited development of the early warning line, which was supported by the Lincoln Laboratory. As mentioned earlier, after further review at higher levels an experimental and developmental program to determine actual requirements for the line got under way in early 1953.[20]

Lincoln Laboratory presented in January 1953 its proposal for a Transition Air Defense System,* utilizing elements developed and tested with the Cape Cod system. Meanwhile, the University of Michigan in conjunction with the Rome Air Development Center had developed an alternative competitive system known as the Air Defense Integrated System (ADIS), which had the special qualification of being closely tied

*The Transition System replaced an earlier proposal, designated Quick Fix, which was rejected by the Air Force as operationally undesirable after preliminary tests in 1952.

[redacted]

to the Air Force's principal developmental ground-to-air defense missile—the Bomarc. Nevertheless, the Air Force decided in April 1953 to terminate the ADIS proposal and proceed with Lincoln's Transition Air Defense System as the most immediate practical solution, integrating whatever parts of ADIS which were practicable.[21]

Work proceeded during 1953 on the development of various essential components of the Transition System and certain modifications and adaptations to make the system compatible with the Bomarc, with the F-102/MX-1179 combination, and with the Army anti-aircraft weapon system. The Western Electric Company also began work on two experimental early warning lines, one in the United States and one in the Far North.[22]

The principal aim of Project LINCOLN was to create a detection and control system which would afford a high degree of protection against aircraft and missiles flying at both supersonic and subsonic speeds and presumably armed with atomic weapons. The Transition System was intended to bring about major improvements in air defense by adding to present systems equipment which had higher performance than that currently used and which at the same time would fit into future arrangements. The improvements in the Transition System applied almost entirely to data handling and processing, and relied heavily on the use of digital techniques. These would improve the capacity of the system to accept and use information as well as the speed of interpretation. At the same time the automatic processes used would free men of deadening routine. The Transition System would also provide a means of guiding manned interceptors or missiles during the first phase of their search course for the enemy aircraft, after which internal terminal guidance would take over.[23] As an ultimate goal the

[redacted]

Transition System was to lead to the Future System, under which radars would provide complete high and low coverage of all the approaches to North America; the information assembly, interpretation, and control system would provide nearly instantaneous action; and the weapons employed would have a kill probability close to unity. Only thus could a true defense against atomic attack be said to exist.

Despite the active measures taken and the real advances made between 1948 and the end of 1953, the long-range outlook for an effective defense against atomic attack remained discouraging, as Rand pointed out in its third air defense study in December 1953. The Russians successfully effected their first thermonuclear detonation in August 1953, and there was every indication that they would vastly increase their striking power both per plane and in terms of total delivery capability within the next two or three years. Rand pointed out that the air defense system would have serious deficiencies throughout the 1954-1960 period which would not be removed by any new devices or systems under way or which had been proposed by either the Lincoln Laboratory or the Air Defense Command. It also concluded that the Soviets by about 1960 might well have developed intercontinental missiles of high supersonic speed and more than 60,000 feet altitude and went on to point out that no complete concept of a defense system against such weapons had been suggested, let alone the necessary supporting developments. The study estimated that such a system, if one could be immediately devised, would require until 1962-1965 to become operational.

Rand thus indicated some basic dilemmas in the air defense system. The existing system had serious weaknesses which could be exploited by the Soviet Union, possibly with disastrous results to the United States. The corrective measures being pressed by the Lincoln Laboratory and the

Air Defense Command could somewhat ameliorate but could not eliminate these deficiencies by the end of the 1954-1960 period. Meanwhile, the Soviets might well have developed an entirely new capability with high supersonic intercontinental missiles which would render almost the entire air defense system obsolete.

Rand saw the principal Soviet objectives as the major metropolitan areas (including their associated industrial facilities) and the bases of the Strategic Air Command. The problem of defense during the period would be to exact a continually rising percentage of losses against intruding air forces, reaching over 90 per cent by 1960, in order to prevent decisive losses to the national economy or its principal striking component.* Rand sought to determine how closely air defense could approach such levels of attrition through various systems which could be devised within the limits of "reasonable" expenditures.[25]

To deal with the Soviet threat Rand presented a proposed air defense system with establishment scaled over the period 1954 to 1960 and based on four factors—the estimated nature and size of the threat, the targets to defend, the proposed sensing system, and the proposed weapon system.** The proposed sensing and weapons systems were by no means entirely new, but would incorporate most of the programmed air defense system, to which would be added several specific measures already under consideration—including the Lincoln Laboratory Transition System—together with various other actions to fill existing gaps and deficiencies.

*The percentage of enemy losses would have to rise constantly in order to take care of the increasing power of nuclear weapons, the average yield of which was estimated as five megatons by 1960.

**The proposed system would cost an average of four billion dollars per year for the 1954-1960 period and about six billion per year by 1960, or a total of 30 billion dollars for the period. In contrast a "maximum" air defense system might cost up to 100 billion dollars for the same period.

Although space does not permit reviewing these in detail, it may be pointed out that the principal claim made was that it would produce a relatively large increase in effectiveness at relatively small cost by exploiting those air defense measures which would have the largest yield when added to the programmed system.[26]

For the proposed system a probable effectiveness was estimated for the 1956-1960 period of limiting the percentage of destruction of our 52 major cities to about 40 per cent, although it was conceded that under unfavorable circumstances damage might run as much as twice this figure. Effectiveness would be somewhat higher for the 1954-1956 period because of the lower Soviet capability and smaller atomic stockpile. The 20 per cent target destruction figure, regarded as a critical turning point in terms of effect on the American economy, was looked on as an almost unattainable goal, even with higher expenditures.[27]

As desirable actions in the event that larger sums of money became available, Rand set forth certain other possible measures. This included three major recommendations: (1) raising the effectiveness of the conventional weapons system by increasing the number of air defense major weapons components and using organizations, (2) improvement of the intelligence warning system by adopting certain specific measures, (3) development of the components necessary for a distant early warning line and construction of the line provided that certain operational questions could be satisfactorily answered.[28]

For dealing with the threat of Russian intercontinental missile capability, which admittedly would make obsolete nearly the entire air defense system except for the lingering bomber capability, Rand proposed a vigorous study program of methods of defense against such missiles, continual reassessment of intelligence information and missile

defense concepts, and at a later time a shift from the proposed 1954-1960 system toward a ballistic missile defense system. It was believed that the threat would be imminent by 1960 and possibly somewhat sooner. Meantime, Rand urged that no new major weapon system programs for defense against bomber-type threats be begun. As pointed out, the proposed system would rely entirely on combinations of major components already developed.[29]

Although the Rand study represented only a review with recommendations, it did reveal that the shape of what may be called the intermediate range air defense system was taking definite and final form. Basically, it consisted of a further development of the British World War II system with improved radars, improved weapons, improved communications, and more centralized control. Probably the most original aspects lay in the latter two areas, where automatic collection and transmission techniques were to be combined with the digital computer to provide greatly improved collection data assembly, interpretation, and control measures. The addition of guided missiles, both ground-to-air and air-to-air, was a natural extension of weapon systems already under way during World War II.

The basic problems, perhaps insoluble, of defense against atomic attack all remained as prominent as at the end of World War II. The foreseen development of Russian atomic weapons and high speed long-range aircraft had been further strengthened as direct threats by early development of enormously more powerful nuclear weapons. Even with the improved defense techniques and expanded capability developed during the 1945-1953 period it was doubtful that direct air defense was keeping pace with the menace. Many experts also professed themselves helpless against the intercontinental ballistic missile as a carrier of

atomic weapons, now looked on as not more than seven years ahead. In the situation the inclination was to rely increasingly on atomic offensive capability as a deterrent, using air defense itself as principally a symbol of alertness against surprise attack and as an alarm system which might be partially effective under unexpectedly favorable circumstances. The best hope of the nation for survival thus continued to lie in certain advantages connected with its offensive atomic capability relative to that of Russia—such as better bases for attack, better and more numerous carrier aircraft, and better and more numerous atomic weapons.

The Use of Atomic Weapons in Air Defense

The most novel proposal by Rand in its December 1953 study was that

Programs based on all these concepts were already under way. Rand also recommended thorough exploration of the desirability of using

None of these proposals was new, some having been under active development for several years. The question of using

came under generalized discussion during 1951, when it was the subject of several studies within the military services. In January 1952 the Air Defense Command stated a requirement for

and in response Headquarters, USAF, directed the ADC to work out operational tactics for such employment and

the ANDC to establish technical feasibility.[31] This referred primarily to the use of level and toss bombing techniques. The directive led in June 1952 to the establishment of Project the brunt of which was carried by the Air Research and Development Command, to establish the feasibility of the use of atomic weapons in air defense.

Meanwhile, action was also proceeding from another direction in a way which forced the hand of the Air Force and prodded it to more vigorous action. In February 1952 the Army recommended and the Joint Chiefs of Staff approved the study by the Joint Air Defense Board of the use of [Indicating a belief that could make a major contribution to air defense, the JCS directed the JADB to investigate the problems of such use, recommend concepts for employment, and recommend guidelines for development. The Military Liaison Committee also notified the Atomic Energy Commission of this new military interest in March 1952.[32]

This activity at higher Department of Defense levels reflected strong interest by both the Army and Navy in a Although the JADB did not report until January 1953, the MLC in October, acting on Navy prompting, requested the AEC to start preliminary investigation of the problems involved.[33] The Division of Military Application, AEC, seemed to take up this work with some enthusiasm, with particular reference to the Navy's Talos-W missile. Apparently in close contact with the Navy, the DMA advised the MLC of the probable need for a full warhead development authorization by March 1953, since the Navy planned flight tests for Talos-W beginning in November 1953.

In December 1952 the Research and Development Board concurred in a Navy-stated requirement for the development of an

on the basis of supporting recommendations by the Committee on Atomic Energy and the Committee on Guided Missiles. Meanwhile, the Bell Telephone Laboratories and Douglas Aircraft had collaborated on a feasibility study of an

and a favorable report was published in July 1952. During the same period the Air Force was also spurred to activity, and Boeing began investigation of design changes to permit carriage of an

The Joint Air Defense Board report, which came on 14 January 1953, served to open the floodgates for action in all phases of the program. In general, the fifteen conclusions of the report supported the view that

The study

indicated that

The JAEB's recommendations followed the above conclusions. They called for a development program aimed at weapons; target studies to determine the targets to be defended; operational analysis studies to determine the optimum family of weapons; effects studies to determine the operational factors; a program to develop an air-to-air rocket with atomic warhead, delivery equipment, and tactics for interceptors; and development programs for the

[36] The JCS acted almost immediately by

approving on 26 January 1953 military requirements recommended by the Navy for surface-to-air guided missile systems using existing atomic weapons for air defense.]

The arrangement proposed was that the Navy proceed with non-nuclear phases of Talos-W development and that the AEC carry out feasibility studies relative to the adaptation of the TX-12 and give technical assistance to the Bureau of Ordnance. Following this, the AEC would proceed with engineering development of the warhead. The MLC notified the AEC on 10 February 1953 of the new requirement, with the immediate objective the development of the system described in Johns Hopkins Applied Physics Laboratory Report TG-121: A Design Study of the Modification of Talos to Talos-W. Every effort was to be made to design into the test missiles every feature required for tactical operation.[37]

[In the case of the Air Force surface-to-air missile Bomarc the JCS had approved on 20 March 1953 an Air Force proposal for the adaptation of the X

proposal was based on the Boeing study "Carriage of a

[37] The proposal had been approved by the EDP on 5 March. (MLC Minutes of 1 April 1953, memorandum by Capt. R. P. Hunter.)

Special Weapon in the MX-1599," dated 29 January 1953. The Bomarc, or F-99, would of course have a considerably greater range than either Talos-W or Nike-B, but was also farther from the final stage of development.[39] The need of the Air Force for an anti-aircraft missile closer to the operational stage was to lead it the following year to adopt the Talos in land-based form as a short-term expedient.

Meanwhile, action was proceeding within the Air Force on Project which emphasized the air-to-air use of atomic weapons. Interest was naturally intensified by the favorable report of the AADB in January 1953, which included recognition that air-to-air use of atomic weapons was both feasible and promising. Without waiting for conclusion of the study, the Air Defense Command seized the opportunity to ask in March 1953 that it be provided with atomic capability along two lines: air-to-air bombing by interceptors as a short range measure and surface-to-air guided missiles as a longer range one. It also presented the concept that the former was particularly suitable for outer range area defense and the latter for close-in defense in the target area. More specifically ADC asked for atomic armed interceptors (F-89D) and Talos missiles with atomic warheads.[40] No immediate action appears to have been taken on the requests.

Issued by the Special Weapons Center on 8 June 1953, the report on Project is a summary and consolidation of reports from the various concerned development centers of the AMC.[41] Although the study was set up to cover the entire period from 1952 and 1962 in two phases, almost the entire effort was devoted to the near and intermediate term, employing atomic armed air defense vehicles, either operational or under development, against real or theoretical Russian

[redacted]

bombers based on the TU-4 and B-52. A principal conclusion stated that both air-to-air atomic bombing from present interceptors and air-to-air atomic rocketry using currently available missiles were impracticable against maneuvering targets and that it would be necessary to develop a high velocity rocket as the carrier delivery weapon to alleviate the critical fire control and interceptor escape problems inherent in air-to-air bombing.

Some other conclusions in this broad study were as follows:

(3) the

was not of primary importance from a defense viewpoint; (4) nuclear weapons were adaptable to air defense ground handling operations; (5) external detection of an atomic bomb within an aircraft* was not practicable by presently known methods.[43]

*This possibility had been first raised and summarily rejected in 1947. (See Volume II, Chapter 9R.) It was now reexamined by the Cambridge Research Center using air conductivity as effected by the passing bomb as a method, but tests were completely negative. (History of CRC, July-Dec. 1952, Vol XVII, Chap 8, p. 81-96.)

[redacted]

[redacted]

It should be mentioned that the conclusions and recommendations of the above report were generally supported in a Rand study which had appeared on 1 May 1953 in preliminary form and reissued 22 December in expanded form. It found that the addition of atomic armaments to the air defense system would greatly enhance its kill probability at a cost small in proportion to that of the system as a whole. Like the

and differed with in finding appropriate also a program for equipping the F-89D with an

The recommendations of the report followed the above lines—in particular that a high velocity rocket (3000 feet per second) capable of carrying a TX-12 warhead be developed. Additional studies or tests were also recommended on bomber maneuvers to evade attack, lethal gust envelopes, high altitude atomic weapons effects (including a test), capability of the F-89D and F-94C with air-to-air rockets, and maximum gamma radiation tolerance for the interceptor pilot.[45]

In early succession to the report a conference was held among Headquarters, USAF, ADC and ARDC representatives to consider an implementing program. The following recommendations were made: (1) further study of free fall bombing as an ADC-APGC project to be completed by March 1954; (2) development of a suitable existing fire

control system using the [redacted]

[redacted] (4) study of the [redacted] as an interim weapon carrier;* (5) development of a [redacted].

Headquarters accepted parts of this, directing the Air Proving Ground Command on 22 September 1953 to study air-to-air bombing and the ARDC to study the adaptability of small warheads to guided rockets including Boar.[47] Work had of course already begun on the Bomare atomic warhead version following the JCS requirement statement early in 1953.

It should be pointed out that Boar, the Navy air-to-ground missile had been studied by the SWC early in 1953 was r[redacted]. Accordingly, it was disregarded in the [redacted] Report. Revived at the insistence of the ADC, the ARDC asked the Special Weapons Center to draw up military characteristics for a [redacted] carrying missile. The SWC now reversed its former stand and confirmed the practicability of the system, which would employ an F-102 to carry the missile. As a result the ARDC issued a development directive in April 1954. The proposed missile was designated Ding Dong until February 1956, when it became High Card and still later the MB-1.[48] The Air Force had obtained JCS approval for the proposed air defense missile under the same arrangement as in the case of the surface-to-air missile. The ARDC was assigned responsibility for developing the missile by the Air Force, and the ADC was to design the warhead. The

*The [redacted] had in November 1953 been mentioned as a possibility for adaptation in the Heavenbound report.

**The missile would resemble the [redacted] but would have much higher velocity.

requirement stated to the AEC by the JCS called for a warhead

and weighing not more tha

By early 1954 the program to develop an atomic capability for air defense was thus well under way. This was made possible by the development of smaller atomic bombs and the great increase in the production of nuclear material. Ultimately atomic weapons promised to become as essential in air defense as in strategic and tactical air warfare.

One other proposed application of atomic energy to air defense might be mentioned in passing. In late 1952 a proposal, originating within the ANC, was made that . be applied to air defense. If effective, such a use would result

However, current were cumbersome, expensive, and limited in range. The proposal apparently was first officially considered in a meeting in the AEC Research and Development Division on 3 October 1952. At the request of the MLC the AFSWP prepared an extensive report on the subject which was submitted at the MLC meeting of 18 December 1952. In general the AFSWP report concluded that much additional research would be necessary before a final evaluation could be made. It recommended that support be given to ANC-Office of Naval Research programs looking to the development of small for research purposes.[50]

After endorsement by the MLC and CAE the AFSWP requested the AEC to participate in a research program on 15 January 1953. At about the same time the Air Force requested RAND to evaluate the overall effectiveness and feasibility from the standpoint of cost.[51] No near term concrete applications resulted from these programs.

[redacted]

The Air Defense of Atomic Installations

When the first operational steps were taken in 1948 for the air defense of the United States against atomic attack, great emphasis was placed on the nation's atomic installations--including particularly the fissionable material production plants at Hanford and Oak Ridge and weapons production facilities at Los Alamos and Sandia Base. Although the number of fighter defense and aircraft warning units available was very small, some of each were assigned to the Hanford and Sandia areas during 1948 and 1949, and Oak Ridge was given a token defense force and rudimentary warning facilities in early 1950.[52] The defense system established in the Sandia-Los Alamos area was the most impressive, since it was an island system employing an entire fighter wing and was devoted almost solely to the defense of atomic installations.

It is noticeable, however, that despite the increase in strength of the Air Defense Command down to the end of 1953 the percentage of operational strength devoted primarily to air defense of atomic installations declined steadily. The force established near the Oak Ridge facilities hardly increased to more than token strength. That stationed near Sandia was reduced from a wing to a squadron. Only in the area of the Hanford installation was there a significant increase. Plans called for an increase to three squadrons by mid-1954, and four anti-aircraft battalions were established about the plants during 1950 and 1951. Most of the Hanford air defenses were, however, readily convertible to and and tied in with the air defense of the Northwest, the most vulnerable section of the Continental United States.[53]

The above situations reflected three principal factors: (1) the

[redacted]

production of an increasing stockpile of atomic bombs which would make it unnecessary to rely on additional production after war began; (2) the growing realization that the decision in an atomic war would be achieved by the forces and weapons existing at its beginning; (3) increased dispersion of atomic bombs at sites specially designed to endure air attack. It may be said that the Air Defense Command was never inclined toward tying down the relatively scanty forces it controlled during the 1948-1953 period to the defense of specified points such as the atomic fissionable material and weapons production centers. It favored rather the inclusion of the AEC installations within area defense systems.[54]

Nevertheless, various considerations, including particularly the high priority assigned to the AEC installations in the overall list of U. S. installations regarded as potential targets made special consideration mandatory for these. The Joint Chiefs took steps to compile a master list of vital U. S. facilities in September 1948, enlisting the aid of the Secretary of Defense to approach other agencies of the Department of Defense and other executive departments. Each service submitted a list of vital facilities;

1

The various lists, after numerous revisions, were finally approved in May 1949 and transmitted to the Secretary of Defense.[55]

The JCS in August 1949 accepted the Army-Air Force view that only facilities related to atomic activities be placed in Category A. Other criteria for this category were that destruction would impose (1) a delay of 30 days or a reduction of 50 per cent in the U. S. capability to

launch a retaliatory atomic offensive, (2) a loss of six months of fissionable material production or an equivalent portion of the stockpile, or (3) a delay of six months or more in research and development on atomic weapons. Under the revised criteria the Air Force placed

In January 1950 the JCS directed an ad hoc committee to review the list of facilities, and the committee reported in May to recommend revision of the criteria for the four categories—A (indispensable), B (vital), C (critical), and D (important). Destruction of the facilities listed in Category A under the revised criteria would cause an unacceptable delay or reduction in our ability to wage war, require major revision in strategic mobilization or operational plans, or likely prove adversely decisive in affecting the outcome of the war. This was approved by the JCS, with the effect of throwing out the atomic criterion and allowing greater flexibility. The Continental United States Defense Planning Group was charged with periodically revising the Key Facilities List, which was handled as a registered document of very limited circulation.[57]

Meanwhile, under the prior arrangement described, the AEC had submitted on 20 July 1949 its determination of its priority installations. It involved nine in Category I in the following order of priority:

the air defense system all of the installations in Category I were to be specifically covered by aircraft warning and fighter defense, if necessary by island defense systems, at a relatively early date. In some cases anti-aircraft defenses were also provided for as well as the movement of ground troops in an emergency involving paratrooper attack.[58]

The subject of the air defense of AEC installations was reexamined beginning late in 1950, particularly as to the possibility of reducing vulnerability by passive defense measures. In December the JCS provided the MLC with a list of certain factors which should be considered in new construction, and the MLC suggested that the AEC conduct a survey of existing vital construction facilities and determine the need for modification to reduce vulnerability. The survey was eventually assigned to the Air Force after AEC concurrence, and was carried out by the Air Defense Command in late 1951 and 1952. The MLC and AEC agreed on a revised list of [redacted]

The AEC also notified the MLC in August 1951 that careful consideration was being given to the possibility of blast damage in all new construction.[59]

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[58] This principle had of course always been followed in storage site construction, but not in other types. In planning the construction of the Savannah River installation, the AEC gave particular consideration to the following criteria, provided by the JCS for new critical production facilities:

1. Separation in distance (up to 20 miles) from lakes, rivers, or other well-defined radar landmarks, with due regard to the security of the water supply system.

(Cont'd on following page)

The final result of the reexamination of vulnerability was a study of theoretical type completed in March 1952 and entitled the Passive Defense of Atomic Energy Installations, which set forth the basic factors to be considered;[60] however, apparently it was not followed by any definite action, possibly because military interest was shifting toward the storage problem as the stockpile began to assume sizeable proportions.* Attention was also increasingly turned to the operational storage sites now maintained in conjunction with certain SAC bases. Both Headquarters USAF and the ADC considered the problem of defending the atomic storage sites apart from that of the atomic research and production centers during the first part of 1952.

The Directorate of Intelligence pointed out that certain of the storage sites were subject to possible attack by several different methods, including by airborne parachute troops, by Soviet groups within the U. S. using open or covert methods, by aircraft bombardment with atomic or conventional weapons, by sabotage-commando teams

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*The criterion for construction of storage facilities were recommended by the Joint Board on Future Storage. See Chapter 9 of this volume.

*(Cont'd from preceding page)

2. Employment of terrain features to reduce possible blast effects from an atomic explosion.

3. Dispersion of facilities within the limitations imposed by the requirements for internal and external security.

4. Camouflage and radar deception measures.

5. Bomb-proofing of underground construction of especially vital portions of the installations to the extent practicable.

(AEC Annual Report for Fiscal Year 1951, Oct 1951, p. 33.)

landed from submarines, and by guided missiles launched from submarines. [redacted] was seen as subject to an airborne attack in which converted TU-4's might deliver 40 men each from Siberia by two possible routes. Similar conclusions were reached with respect to the [redacted] which was seen as not only subject to an airborne attack from Russia but as particularly vulnerable to sabotage by Soviet sympathizers or commandos through its proximity to the seacoast and to sparsely settled forested country.[61]

Considerable attention was also being given during 1952 to the vulnerability o[redacted] and other military atomic installations. Headquarters USAF requested the Air Defense Command, in coordination with the AFSWP, SAC and ARC, to restudy the programmed anti-aircraft artillery defense of military atomic installations.[62] Sixty-six anti-aircraft battalions were programmed for a joint defense of critical targets, but [redacted] At this time the AFSWP operated four installations and was scheduled to have two more by 1955, while the Air Materiel Command was to have control of five by 1 January 1954 and the Navy one by 1 July 1953.

The ARC in its conclusions contended that all these installations were inherently strong, being practically invulnerable because of their construction to either conventional or airburst atomic bombs and also possessed of high recuperability. Pointing out furthermore that each new installation would reduce the vulnerability of the entire system, the ARC opposed a point defense of the installations because of their comparative invulnerability and the greater likelihood of attack on urban centers. It proposed instead that they have a "reasonable" air defense through proper deployment of area defense weapons such as

fighter interceptors and the associated aircraft and warning system, together with a maximum use of passive defense. Concluding further that it was highly improbable that the Soviet would expend its strategic bombardment force on paratroop operations, the AAC suggested that the JAC provide sufficient planning flexibility to reduce the effect of the loss of one or more sites.[63]

The [redacted] strongly disagreed with much of the above reasoning, insisting that the installations were probable early targets because a successful attack on them would affect the U. S. war potential sooner than other possible targets. It also contended that a much more detailed study was necessary.[64]

Despite the unenthusiastic attitude of the JDC toward organizing any specialized defense of atomic installations, the Air Force was apparently forced to give in to some extent, and on 29 May the Continental Air Command reported that it had effected detailed coordination with army commanders for the defense of [redacted] This included the provision, in an emergency, of infantry, anti-aircraft, or both from neighboring military installations. Shortly thereafter the area army commanders were directed by G-3 to give similar emergency support to [redacted] these being the locations for new operational storage sites. Nevertheless, regardless of the emphasis given to the atomic storage sites and military bases associated with them, it is clear that the defense of the fissionable material production centers was deemphasized. RAND Study 1076 concluded, for instance, in May 1953 that atomic energy production centers were not of crucial importance and that by 1955 our stockpile of weapons would be so large that additions after the beginning of war would be of little importance.[66]

[redacted]

It may be noted that Rand considered the major metropolitan area the most vital and also the most vulnerable of the potential targets of atomic attack. The only other target system which it considered to be of comparable importance was the strategic air striking force, which at the same time was one of the most vulnerable components of our military forces. Since the above two systems differed considerably as to location, reconciling their conflicting needs for air defense was to become a considerable problem.[67]

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