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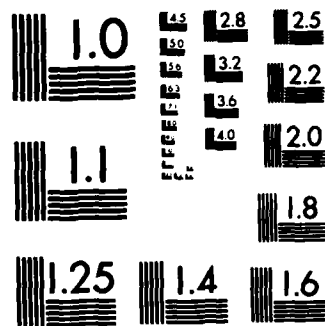
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Thomas A. Keaney

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STRATEGIC BOMBERS AND CONVENTIONAL WEAPONS

Airpower Options

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Airpower Options

by

**Colonel Thomas A. Keaney, US Air Force
Senior Fellow**

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FOREWORD

Since World War II, the role of the long-range bomber in the nuclear triad has shaped the aircraft's development. Although strategic deterrence remains its paramount mission, the bomber's other missions are increasing in number and importance. With new weapons available, and with increased requirements for conventional forces in general, the role of the long-range bomber deserves thoughtful study.

Focusing on a nonnuclear role, ^{the author} Colonel Thomas A. Keaney, US Air Force, argues that new, additional long-range bomber technologies, tactics, and plans must be developed. He examines strategic thought about the use of long-range bombers since 1945, and then addresses the bomber's capacity for various maritime and force projection missions. Even while calling for the actions needed to prepare bombers for these conventional uses, ~~Colonel Keaney~~ ^{he} fears that the required changes may go by the wayside, victim again to the demands of the nuclear role.

How bombers have been used successfully in past wars may not serve as a reliable model for the future. Too much has changed. Colonel Keaney asks us to formulate a clearer vision

of the future to make the best, most effective use of the long-range bomber. The National Defense University is pleased to present this treatment of a key element in our airpower arsenal.

A handwritten signature in cursive script, reading "Richard D. Lawrence".

Richard D. Lawrence
Lieutenant General, US Army
President, National Defense University

ABOUT THE AUTHOR

Colonel Thomas A. Keaney, US Air Force, wrote this monograph while a Senior Fellow at the National Defense University in 1982 and 1983.

Colonel Keaney is a command pilot with more than 4,000 flying hours, most in bombers. He served a combat tour as a forward air controller in Vietnam and during his career had experience with B-52 conventional bombing, mine-laying, and sea surveillance. His assignments ranged from Europe to the Pacific, in both operations and command positions.

A graduate of the US Air Force Academy with a B.S. degree and a major in humanities, Colonel Keaney also holds M.A. and Ph.D. degrees in history from the University of Michigan. He is a distinguished graduate of the US Air Force Squadron Officers' School and a 1983 graduate of the National War College. Colonel Keaney served as an associate professor of history at the US Air Force Academy from 1973 to 1977, specializing in European and military history.

Colonel Keaney is now the Chief of the Strategy Division, Directorate of Plans, Headquarters, US Air Force.

INTRODUCTION

On a bombing range 70 miles from Cairo, a group of United States and Egyptian military officers gathered to watch the start of the final phase of Bright Star 82, a joint military exercise involving elements of the US Rapid Deployment Joint Task Force (RDJTF).¹ Joining the officers were military representatives from China and several Arab and Warsaw Pact countries. A mile away was the target, oil spread in the sand simulating a runway. The attackers were to be six B-52H bombers of the Strategic Projection Force, the Strategic Air Command's unit set up to operate with the RDJTF. The bombers sought to meet a precise target time as part of a schedule that included fighter strikes and then a land assault. The timing problem was particularly complex because the bombers had launched the day prior from bases 7,500 miles away.

The first B-52 appeared low in the horizon only moments before the target time, with five more bombers following in trail. Within four seconds of the target time, the lead bomber released a train of twenty-seven 500-pound bombs on the target. Five more times 27 bombs dropped as each aircraft crossed the range at low altitude. Just as rapidly, the bombers were out of sight, continuing on their mission for another 7,500 miles to a landing base in North Dakota.

The deep craters in the sand of what had been a simulated runway were a vivid demonstration of the long-range striking ability of the B-52. And, in undertaking the flights of over 30 hours' duration, the bombers had shown both the

range to strike far-distant points and the payload capacity to affect the land battle, once there. The flights also demonstrated the ever-increasing commitment to use B-52s, even the most sophisticated version, the H model, in conventional roles.²

Using B-52s as an element of conventional power projection is only one form of the bomber's growing involvement in missions outside of nuclear deterrence. B-52s routinely train in sea surveillance and aerial mine laying and possess limited capability for employing ship-attack weapons, maritime missions undertaken in addition to training in conventional bombing from both high and low altitude. Moreover, the follow-on bomber to the B-52, the B-1B, is described explicitly as a multirole bomber, able to undertake various nuclear and conventional roles. With such capability the possibilities for conventional employment now range from bombing in such places as Europe, Korea, or Southwest Asia to joint action with the Navy on a worldwide basis. This growing involvement in conventional roles necessitates increased attention to the technologies, tactics, and plans that must support conventional involvement. Bomber conventional roles have not received emphasis during peacetime since before the Korean war, and there is much to be resolved. The issues begin as basic as the allocation of bomber resources to the various roles, nuclear and nonnuclear, also a key issue because operational bomber numbers are the lowest in memory (240 B-52s in 16 squadrons).³

Issues also touch the B-52H, the model used in the Bright Star exercises. The B-52H can carry 27 bombs internally but lacks the modification that allowed its conventional predecessor, the B-52D, to carry 84 bombs internally. Moreover, the 500-pound and 750-pound bombs, primary ordnance for the B-52 when it is used conventionally, are the same type of bombs employed by B-52s in Southeast Asia and reflect a technology of the first, rather than the last, half of the twentieth century. The situation is particularly anomalous when comparing these munitions to the sophisticated nuclear weapons and missiles these same bombers can

carry or to the precision munitions the fighter aircraft now carry. The B-52 has extensive electronic countermeasures equipment, radar and television displays for flying low level, and communications ability via satellite. But, to attack conventionally, the aircraft must fly over the target and rely on gravity bombs to do damage. There are research programs to provide precision, standoff missiles for bombers' use, but many questions remain over what weapons are needed and how these weapons and aircraft should be used.

In this monograph, I address current capabilities and intentions for bomber conventional employment, the policies and perceptions that have led to the present situation, and the actions needed to make bombers a match for the tasks they will face. The following chapters deal successively with the evolution of strategic thought involving the use of long-range bombers and the bomber's applicability to maritime warfare and force projection. Taken together, these chapters set the context for understanding how bombers can perform outside of their nuclear deterrent role, a role that has restricted conventional roles and predetermined bomber development since the end of World War II.

1. ROLES AND IMAGES— THE BOMBER SINCE 1945

Not since World War II has the bomber focused primarily on conventional warfare. Despite the bomber's successes in the strategic bombing campaigns against Germany and Japan, it very rapidly became the tool of a nuclear deterrent strategy. Even though nuclear deterrence and conventional fighting are by no means incompatible, the concentration on the former since World War II has placed bombers in a special category, subordinating the requirements of the latter. Technical developments, strategic thinking, and operational control of the aircraft were, and still are, affected by this specialized perception of the bomber.

Buoyed by the tremendous results both carrier and land-based aviation had achieved during World War II, the air leaders of the war were supremely confident in airpower and anxious to see its full potential realized in the shaping of post-war military policy. As future roles of airpower were being defined and shaped by these air leaders, two factors decisively influenced airpower's organization and purposes—the drive by the Army Air Forces (AAF) leadership to fashion an independent air arm and the use of the atomic bomb.

Even before the advent of the atomic bomb and the end of the war, the AAF had planned for autonomy in a separate service following the war, just as it had achieved de facto separation from the Army during the war. The AAF leadership built the drive for autonomy around the role of strategic



bombing. This role, only one of airpower's successful employments during the war, exemplified air combat's unique and decisive qualities. It was a role that could be carried out, moreover, without reliance on or support from the Army or Navy, and it became the rallying point for independence.

The atomic bomb seemed only to enhance the case for strategic bombing. During the war there were disputes over the resources expended in building a strategic bombing force and the accuracy of the bombers, their defensibility, and their ultimate effect. However, the existence of the atomic bomb at least temporarily set aside or made irrelevant such concerns. It was in this atmosphere that the other successes of airpower in the war were overlooked. The organizational drive in 1945-46 was for an independent air force built around an atomic striking force of bombers, an orientation that had marked effects on airpower's other roles.

The predominance given to strategic bombing retarded progress in several areas, notably tactical aviation, and confined the bomber itself to a narrowly defined role.¹ Even though bombers had enjoyed notable success in World War II in aerial mining, sea surveillance, and battlefield interdiction, strategic bombing advocates attempted during the war to restrict these other roles, viewing them as an interference and ultimately a hindrance to the bombing campaign.

After the war, the drive for air force autonomy and the strategic potential of the atomic bomb silenced talk of other roles for the long-range bombers. For over 30 years the atomic, and later nuclear, strike role and its doctrine dominated all planning, weapons development, procurement, tactics, and training for long-range bombers. This thrust and the consequent retarded or eclipsed development of other roles have continued to the present. Projections for conventional employment as they are based on the perceptions and attitudes of this experience betray a disjointed nature or inconsistencies that can only be understood by an awareness of this history.

THE ATOMIC STRIKE FORCE

As is often the case with new ideas, the concept of a strategic atomic air attack was well ahead of the capability to execute. Given the conditions just after World War II, such mismatches of doctrine, strategy, and force were probably inevitable. During this time, the wartime force of men and aircraft was dispersed; the arrangement of potential enemies and structure of the post-war world was yet to be discerned; and the highly politicized topics of military unification and air force autonomy intensified mistrust among the Services.

Secrecy surrounding atomic bomb development after the war was such that the actual weapons effects, the weapons numbers limitations, and future availability were not widely known or understood. For instance, in July 1946, an atomic bomb test on Bikini Atoll had damaged or sunk 59 of the 73 ships in the area, and blackened and burned ships a mile from the blast. Yet more than 2 years later, the head of the Navy's Aviation Ordnance Branch stated to Congress,

You could stand in the open at one end of the north-south runway at the Washington National Airport, with no more protection than the clothes you now have on, and have an atomic bomb explode at the other end of the runway without serious injury to you.²

Similarly, few knew how many bombs were actually available. Evidence now shows that the stockpile of atomic weapons numbered 9 in 1946, 13 in 1947, 50 in 1948; it climbed into the several hundreds only in 1950.³

The bomber force remaining after the post-war drawdown was small and short of weapons but still firmly oriented toward an atomic strike as an overall strategy. Thus, when the Strategic Air Command (SAC) organized in March 1946, over a year before the establishment of the Air Force, it had only one unit qualified to deliver an atomic bomb, the 509th Composite Group. This unit and its 27 B-29s would remain the only atomic-capable unit through 1947.⁴ Plans called for the 509th

to operate as part of a larger force of aircraft with conventional weapons, the atomic-capable aircraft to drop their bombs in bad weather and at night to preserve limited resources from attack.⁵

SAC's small force began to grow rapidly only after Lieutenant General Curtis LeMay assumed command in October 1948. General LeMay remained SAC's commander until 1957; under his leadership SAC moved ever more firmly to a force role dedicated to atomic or nuclear strike. Samuel Huntington compared LeMay's impact on SAC with J. Edgar Hoover's impact on the Federal Bureau of Investigation:

Both infused their organizations with a new sense of mission, stressing the need for professionalism and imposing new standards of competence and discipline upon their personnel. Both presided over major expansions of the organization while refusing to take on functions not closely related to its fundamental purpose.⁶

That purpose was of course a single, particular use of bombers. General LeMay pushed hard for more and newer aircraft, thorough training of crews, and above all, an organization "in which all else was ruthlessly subordinated to combat readiness and effectiveness justified in terms of the mission which the organization served."⁷

In 1948 the Air Force defined the organization's mission: "the launching of an atomic offensive and the defense of the Western Hemisphere and the essential base areas from which to launch the atomic offensive must be considered as the primary mission of the Air Force and must be given the highest priority and consideration."⁸ As a result, when the Air Force faced severe budget limitations, it suspended or delayed purchases of fighters and transport aircraft and bought more of the newest long-range bombers, the B-36.⁹

With the B-36, the forward bases in Europe and the Far East, and the base preparations in England and on Guam for handling and storing of atomic weapons, SAC had a worldwide presence and a role as guardian of the peace. And, in 1948, a key year in the developing cold war, the peace

seemed especially threatened as the Communists seized power in Czechoslovakia, the Berlin blockade began, and the Nationalist government in China neared collapse by the year's end.

AIR FORCE-NAVY CONTROVERSY

Air Force expansion in 1948 and 1949 initiated a conflict between the Air Force and the Navy that had been simmering for several years. Sometimes recorded as the "B-36 Controversy," the "B-36 vs the supercarrier," or "Revolt of the Admirals," the dispute had long-term implications for inter-Service rivalry in roles and missions, budget allocations, and the trends in the Services' strategic plans.

Briefly stated, the Air Force-Navy controversy arose over the control of the atomic bomb and its planned employment. The rapid growth in SAC's organization and influence had threatened the Navy's role as guardian of worldwide US interests. The particular point of strife concerned the role of the aircraft carrier, the ship the Navy had built its plans around following the war. Atomic bombs were too large and heavy to be carried in any aircraft except bombers, so the Navy contracted for large attack aircraft capable of large payloads and planned to build supercarriers to launch them.

Declining defense budgets intervened and induced a crisis. In 1947, defense funding had been \$14.4 billion, had dropped to \$11.7 billion for fiscal year 1948, and was slated to be only \$11.0 billion for fiscal year 1949. When Congress approved continued Air Force expansion (principally based on the heavy bomber) that would have raised the cost of Service requirements to \$18 billion for fiscal year 1949, hard choices had to be made. The Navy's supercarrier was the most notable victim. In April, 1949, Secretary of Defense Louis Johnson cancelled the carrier *United States* just after the keel had been laid.¹⁰

The Navy, seeing the carrier cancellation as a crippling blow to its long-term interests, counterattacked on several

fronts. Charges ranged from accusations of improper Army and Air Force influence with Congress, to allegations of fraud in the awarding of the B-36 contract, to questions of the prevailing atomic strategy. The Navy criticized the B-36's bombing accuracy and its defensibility against the coming class of jet fighters and even challenged the whole concept of atomic "annihilation." This last point was a particularly sensitive one, both because it called into question the direction the United States was going with its security strategy and because it affected the Navy's own plans for the future—carriers able to launch atomic strikes. Boiled down and cast in today's terminology, the arguments involved the issue of an all-out strategic nuclear retaliation versus limited tactical nuclear use on the one hand, and the issue of industrial versus military force targeting on the other. In short, the Navy was not against use of atomic weapons; its opinion was, however, that the B-36 could employ only an industrial bombing strategy, a strategy that would be both wrong and ineffective.

The outcome of the controversy was ambiguous, particularly in the area of the proper atomic strategy. Besides the departure of the Chief of Naval Operations, Admiral Louis Denfeld, no immediate changes occurred, but some alteration in Service attitudes was notable. The Navy, which had based its drive for the supercarrier on the atomic strike role, now turned more to advocating the flexibility and mobility of carrier warfare instead.¹¹ The Air Force, on the other hand, intensified its commitment to the atomic role. The attacks on B-36 vulnerability probably hastened the development of the all-jet B-47 and B-52. The strategic air offensive role stayed with the Air Force, and vice-versa.

This 1949 controversy could have had far-reaching results in a different time period. If budgets had remained constant, the B-36 issue could have been the opening skirmish in a more general debate on defense issues involving hard decisions on missions and areas of cooperation. This was not such a time, however, as the fall of the Nationalist government in China and the knowledge of the Soviet test of an atomic bomb in late 1949 prompted further fears about US security.

These fears and the start of the Korean war in 1950 soon loosened budget constraints and brought on an expansion in all areas of military spending.

THE KOREAN WAR EXPERIENCE

The Korean war created a difficult situation for SAC. Bomber strategy was dedicated to an atomic strike; most of the B-29s were not configured for atomic bombs, but were prepared for World War II strategic bombing tactics. And Korea provided few strategic targets. As a result, Korea was not central to SAC's concerns, and although B-29s were employed throughout the war, there were few lessons learned about conventional employment in this limited war.

Two bomb groups from SAC were among the first units to respond to Korea from the United States once the war began in June 1950. The 22d and 92d Bomb Groups joined the 19th Bomb Group of the Far East Air Force and began their bombing campaign on 13 July 1950. On 1 August, two other groups, the 98th and 307th, deployed on 30-day temporary duty. The five units were organized as bomber command, staffed almost entirely with SAC personnel, and put under the control of Far East Air Force. The bombers soon ran out of strategic targets in North Korea. Lacking these targets, they were employed heavily in an interdiction campaign and in close support of troops during critical times in the ground action.

At the time only 2.5 percent of the targets struck were termed strategic. Moreover, after 26 September 1950, aircraft were actually restricted from hitting strategic targets because the North Koreans were being routed and a quick end to the war seemed likely. In October, with little further action anticipated, the 22d and 92d Bomb Groups were released to their home stations. From then through the duration of the war (until July 1953), bomber command consisted of the three remaining groups, a force of 100 B-29s, with crews provided through periodic rotations.¹²

To put in context SAC's perspective on the Korean war, recall the prevailing US sentiment when the war began. Korea was seen as a sideshow, a feint by the Soviet Union to mask the main attack planned for Europe. This perception (although clouded when the Chinese intervened in Korea a few months later) kept US strategy focused on the possibilities of an expanded war or another front. In July 1950, for instance, even before the two bomb groups deployed to the Far East, two other bomb groups deployed to England.¹³ Later in the year, when the Chinese troops crossed the Yalu and entered the war, General Douglas MacArthur requested the two bomb groups released in October be returned. Even though the Korean situation was desperate, the Joint Chiefs of Staff declined to send the bombers because of the possibility of Japanese bases being attacked. LeMay, noting that Japan and Okinawa were well within range of Chinese aircraft, felt the same way.¹⁴

As to whether the United States should expand the war (with bombing raids across the Yalu, for example), the Air Force Chief of Staff, General Hoyt Vandenberg, believed it would merely be sacrificing SAC's deterrent capability and "pecking at the periphery." General Vandenberg feared that bomber attrition "would fix it so that, should we have to operate in any other area with the full power of the United States Air Force, we would not be able to."¹⁵

There is little doubt that throughout the Korean war SAC's real concern lay elsewhere. General LeMay had a low regard for the conduct of the war overall. With few strategic targets available south of the Yalu, he regarded the bombers as being misused as "flying artillery" and resolutely resisted sending any more B-29s to Korea. LeMay himself favored sending more tactical Air Force units to Korea to assist in the air war.¹⁶ Though LeMay appears, at least in his autobiography, to have been less reluctant than Vandenberg to using bombers across the Yalu, there were other important issues at stake. At the time, LeMay and SAC were looking past the Korean war toward a buildup of SAC as a potent atomic strike force of B-36s and B-47s.

The B-29, meanwhile, was rapidly becoming an aircraft of the past, and this reality rather typified its employment in the war. One consideration was the conversion of units from the B-29 to the B-47 during the war. The units sent to Korea were chosen because of their low priority for conversion. With crew members converting to the B-47 and necessary rotation of Korean war combat crews, a shortage of crews developed. The Air Force alleviated the shortages by using recalled World War II reservists; in the spring of 1951, almost all B-29 replacement crews in Korea were in this category. The result was an essentially dead-end operation for the B-29s and their crews. Although fighter duels involved the most modern aircraft, the F-86 and MiG-15, bomber action was carried out by the least modern aircraft, and wartime experience was gained by those crews who would be of least future use or influence in SAC. These actions were not taken lightly or unknowingly; instead they were in keeping with a well-directed effort to develop long-range bombers for a specific role, and limited wars and conventional bombing were little related to that role.

THE BOMBER AND MASSIVE RETALIATION

Following the Korean war, all US military strategy turned away from the experience of this limited war; the overriding lesson was that such a war should be avoided at all costs. To do this, President Eisenhower instituted the "new look," a military strategy that emphasized airpower or technology over manpower, or massive bombing to deter war rather than attempting to fight numerous local wars. In June 1954, Secretary of State John Foster Dulles announced the policy of "massive retaliation," formally beginning the period when the threat of SAC nuclear bombardment would be the means to deter war.

During the early 1950s, SAC's capability to conduct strategic atomic attack increased considerably. In 1950, the Atomic Energy Commission announced that atomic bombs could be assembly line produced; in 1952, the United States

tested the first hydrogen bomb; and the creation of B-36 and B-47 units continued throughout the Korean war and expanded afterwards. By this time, the B-52 was already in production to replace the B-36. As a sign of the certainty of this aircraft's mission, the USAF Senior Officer's Board ruled that the B-52 should be designed to carry atomic bombs, and no modification to carry conventional weapons was allowed if that modification would change the aircraft's basic weight.¹⁷

Strategic Air Command's expansion was possible because of the large budget increases during the Korean war and the sustained military budget after it, from which the Air Force received up to 50 percent of the total. From 1950 to 1952, the Air Force budget increased from \$5.4 billion to \$22.4 billion, and Air Force wings increased from 48 to 95.¹⁸ SAC's increases from 1949 to 1954 were as follows:¹⁹

	1949	1954
Personnel	71,490	189,106
Aircraft	868 (390 B-29s, 36 B-36s, 99 B-50s, and 343 other)	2,640 (209 B-36s, 795 B-47s, 78 B-50s, and 1,458 other)
Bases	17 CONUS	30 CONUS and 11 overseas

The fiscal year 1955 budget called for expanding the Air Force from 114 wings in 1954, to 120 wings in 1955, and to 137 wings by 1957. At the same time, the budget called for a 13 percent manpower cut for Army, Navy, and Marine Corps in 1955, with further cuts the next 2 years.²⁰ The expansion of the Air Force and cuts everywhere else indicated a clear orientation toward the strategy of massive retaliation.

New weapons and capabilities and the recognition of the growing power of the Soviet Union were a prelude to refining the strategy for deterring a nuclear war. When the United States had superiority, targeting of the Soviet Union was done in a rather sweeping fashion, covering military facilities, industries, and ground troops. When the Soviets acquired the

atomic bomb and the menace to Western Europe became more distinct, the targets were defined more precisely to be the Soviet Union's atomic air assets, first priority, and enemy troop concentrations (targeting in support of the theater commanders), second priority. By 1956, however, the threat of a Soviet air attack on North America became apparent, and General LeMay stated that the United States no longer "could afford the luxury of devoting a substantial portion of our Air Force effort to support of ground forces."²¹ The US strategy aimed directly at destroying the Soviet atomic strike force. Targeting retained this orientation even as the number of US weapons multiplied—for so did the Soviet's. In 1956, there were, in fact, fears that the Soviet Union would have twice as many bombers as the United States by 1959.²²

Because of the growing threat posed by the Soviet Union, two rather pronounced shifts in the role of SAC's bomber force occurred in the 1950s. First, the modern force of B-36s, B-47s, and B-52s was devoted to the role of an atomic/nuclear strike force (B-29s left the inventory in 1954; B-50s in 1955). Second, that role was further refined to strikes against counterair and industrial targets. SAC bombers had moved away from conventional wars, theater support action, and limited wars, even those limited wars, as it turned out, where there were strategic targets.

Bombing in limited war strategy and in support of ground forces became the province of Tactical Air Command (TAC) and Navy carrier aviation. During the 1950s, the Navy had built large carriers to support aircraft with nuclear delivery capability, and this force supported conventional, tactical nuclear, and strategic nuclear scenarios.²³ To react to "brush-fire wars," in 1955 the Air Force set up a Composite Air Strike Force (CASF) within Tactical Air Command. The CASF was to deploy around the globe to act as a deterrent to local wars. Significantly, these tactical air units were also nuclear oriented, leaving conventional weapons capability and the Air Force's ability to support ground forces badly deteriorated. The Lebanon Crisis of 1958 is an example of the trend. To support possible military action in Lebanon, the CASF de-

ployed to Turkey in July 1958. According to a report on this operation, the crews of the strike aircraft, F-100s and B-57s, were all qualified in nuclear weapons delivery, but none of the F-100 pilots had ever practiced dropping conventional bombs. All crews were regarded as "incapable of efficient conventional weapon delivery."²⁴

CHANGES IN THE 1960s

The trend toward an increasingly nuclear strategy, a large strategic bomber force, and neglected local or limited war forces ended with the Kennedy-McNamara strategy of "flexible response." When Robert McNamara took over as Secretary of Defense, he backed the new strategy of flexible response by bringing conventional weapons and stronger conventional forces back into defense planning. The strategy brought greater emphasis to tactical airpower, airlift, and other airpower roles, but it did little to affect bomber employment. The bombers of SAC provided the nuclear umbrella under which all other strategies for a more limited war could operate, and bombers were locked into that specific role.

Among the changes Secretary McNamara instituted were a greater concentration of power within the Office of the Secretary of Defense and an ordering of defense forces into program "packages." These packages were divided by mission, such as "strategic retaliatory," "continental defense," and "general purpose forces."²⁵ Strategic Air Command bombers were "strategic retaliatory," the words *nuclear* and *strategic* now being roughly equivalent. Tactical air power came under the more general rubric of "general purpose forces." The flexibility in the response was to come from increases in the general purpose forces.

Regarding elements of the military by mission categories was not new. During the 1950s, both bombers and aircraft carriers held high priority in funding because of their definition as the nuclear retaliatory capability. The difference under McNamara was a stricter accounting and justification of pur-

pose and force level by function. The aircraft carrier was able to move easily into the general purpose category, but bombers were firmly rooted as nuclear/strategic. But such labeling was not by its nature a disadvantage, for the nuclear umbrella was still to have the highest priority for readiness funding. Critical decision time came immediately, however, with the introduction of the intercontinental ballistic missile (ICBM) into the functional strategic retaliatory category.

The development of ICBMs Atlas, Titan, and Minuteman and the nuclear submarine-launched ballistic missile (SLBM) challenged long-range bombers. For staging a nuclear strike, the missiles' short flight time, protective silos, and invulnerability to defense gave them a great advantage over bombers. Moreover, with the Soviet Union building similar weapon systems, the entire US bomber force became vulnerable when on the ground. Missiles could be hardened; bombers could not, nor kept airborne in large numbers because of cost and maintenance problems. Even increased ground alert was difficult because of the greater crew ratios required. The bombers still retained the advantage of a manned system's flexibility and found a place in the triad of strategic weapons, but shorn of multiple roles, they became less attractive. The days of the expanding bomber force were over.

In retrospect, the rise of the SAC bomber force was both remarkably rapid and short-lived. The SAC bomber numbers peaked at 1,854 in 1959, the year the last B 36 retired (that year there were 1,366 B-47s and 488 B-52s). By 1962, the year the last B-52 was delivered, bombers numbered 1,595, including a force of supersonic B-58s and a declining number of B-47s. Robert McNamara, a student of strict function of forces and their "sufficiency," advocated drastically reducing those numbers. He saw the size of the strategic retaliatory force as lending itself "rather well to reasonably precise calculations."²⁶ When the size was calculated and the bomber portion allocated, the bomber force level was determined.

The Air Force had provided no justification for SAC bombers outside of the strategic retaliatory function. First, McNamara stopped further production of B-58s and B-52s.

Next, the phase-out of B-47s was accelerated to provide more crews for B-52s, as they would require higher crew ratios to accommodate increased ground alert. Finally, he terminated the follow-on bomber to the B-52, the XB-70. The B-58 and XB-70 were particularly vulnerable, for they were built not only strictly as nuclear weapons bombers but also for supersonic, high-altitude bomb runs. When radar and surface to air missile (SAM) networks forced bombers to plan penetration at low altitude, both B-58 and XB-70 aircraft were out of their element and without the flexibility to adjust their tactics.

The XB-70 well illustrates the fate of a weapons system trapped in a too-narrow role. After Secretary McNamara took dead aim at the program, the Air Force, with General LeMay as Air Force Chief of Staff, fought hard to retain it. One tactic was a change in designation to RS-70, for reconnaissance/strike. The role of the RS-70 was portrayed as gathering intelligence, assessing damage, and bombing targets during and after the initial nuclear strike. In an address to the House Subcommittee on Appropriations, then-Colonel David C. Jones pointed out the many advantages in this manned system, saying, "it is ideally suited for employment in a strategy of flexible response."²⁷ Invoking the key words, flexible response, had little effect, however, because the flexibility desired in the strategy was in conventional applications, and here the RS-70 had little to offer. The aircraft could do many tasks better than the B-52, but it was judged not worth the expense.

Despite the fact that the XB-70 was really the culmination of years of specializing and designing bombers for a single role, these trends reduced the bomber's versatility and made it vulnerable when confronted by the twin obstacles of the ICBM and Secretary McNamara's approach to Air Force programs. In a study of the McNamara years, Gregory Palmer called the approach to defense problems that McNamara brought to the Pentagon the "rationalist approach." Palmer identified quantification and lack of flexibility as weaknesses in this approach. In Palmer's view of the approach, "its very efficiency prevents flexibility by eliminating what does not contrib-

ute to achieving the current objective so that alternative means are not available if the objective is changed."²⁸ When the ballistic missile appeared to have the clear advantage over manned bombers in a nuclear strike, the bomber had to go; alternative uses of long-range bombers either were not mentioned or were not quantifiable. Just how fast bombers might have departed the scene is illustrated by Roswell Gilpatrick's article in *Foreign Affairs* in April 1964. Gilpatrick, who had just left the Deputy Secretary of Defense post, proposed a lineup of strategic retaliatory forces for 1970 that included no bombers.²⁹

As it happened, the demise of bombers was actually slower than planned. In 1965, Secretary McNamara announced a program to phase out all B-58s and all but the B-52G and Hs by 1971.³⁰ At the same time, in a curious move unexplainable in terms of how he viewed strategic bomber utility, Secretary McNamara announced that 210 FB-111s would be purchased to replace the B-58s and B-52s. The number was reduced to 76 FB-111s by a later Defense Secretary, Melvin Laird—in essence, Laird accepted those under production and cancelled the rest.³¹ But, for the future, all that the McNamara program allowed was relatively low funding for research on concepts for manned bombers; the most prominent of these concepts was the advanced manned precision strike system (AMPSS), a system having the general characteristics of the XB-70 with low-altitude capability.³² Despite the encroachment of missiles on the strategic retaliatory role of bombers and the low priority given to future bomber programs, the Air Force did little to redefine or reorient the long-range bomber's role. Emphasis remained on the bomber's place in the strategic triad.

In 1965, however, the B-52 began operations in Vietnam in a role outside that projected for the triad. Although strategic thinking on the bomber's role did not change, Vietnam employment led in some often bewildering directions, explainable from the B-52's prime role, strategic deterrence.

THE B-52 IN SOUTHEAST ASIA

The strategic deterrent role restricted all facets of B-52 employment in Vietnam. Until quite late in the war, B-52s were not sent over North Vietnam because of the potential repercussions, both tactical and political, if one were lost. General William Momyer, Commander of 7th Air Force in Vietnam from 1966 to 1968 and later Commander of Tactical Air Command, pointed out that US civilian leadership was concerned "about the effect losing even a single aircraft would have on the image of our strategic deterrent." General Momyer cited this reason and the US leadership's desire to avoid the perception of conflict escalation by the North Vietnamese if B-52s were used in the North.³³ Thus, extensive precautions surrounded all B-52 employment. In the war, even when B-52s flew near the demilitarized zone, their protection assumed the highest priority for tactical air forces.³⁴

The effects of the B-52 employment policies stood previous doctrines on their heads. The B-52s bombed suspected troop concentrations, headquarter's areas, and supply lines. They were frequently used for close air support of ground forces. All of General LeMay's images of "flying artillery" had come true. The strategic targets that existed were in the North, the province of fighter aircraft. Even terms were obscured; headlines proclaimed "US bombers strike Hanoi," but the "bombers" were F-105s, F-4s, and A-7s. Ironically, the F-111 was introduced into the bombing of the North in 1968, but the FB-111 never appeared.

A continuing problem of B-52 employment was in the control of the B-52 strikes. Because the B-52s had a primary mission of nuclear deterrence, their control remained with the Commander-in-Chief, SAC, even during their deployments to Southeast Asia. General Momyer complained that while commander of 7th AF he had no control of the bombers' targets, timing, or attack profile in what was his area of operations. This problem of control remained throughout the war.³⁵

The issue of control of air assets, particularly of bombers, is almost as old as military aviation. Usually this conflict has been over the diversion of bombers to interdiction, close air support, or other missions and away from a concentration on strategic bombing. Control by a bomber commander was to solve that. Again, ironically this control was achieved in a war in which the bombers were restricted to so-called diversionary targets, and the control itself became an impediment to close coordination of strikes.

The B-52 bombing effort in Southeast Asia lasted for 8 years, but could be sustained along with the nuclear mission because of the large size of the B-52 force. For most of the war, 50 bombers were employed, about half the number of bombers used in Korea. Only during the Linebacker operation of 1972, when the number of deployed bombers reached 200, was there a significant impact on the primary mission. Curiously enough, sustaining the 8-year effort was eased by the simultaneous B-52 retirement schedule outlined in 1965. From 1965 to 1973, the number of B-52s in the inventory decreased by about 200 (from 600 to 400), but this provided some latitude in crew manning and replacing aircraft which logged the most flying hours.

The early model B-52s, the ones slated for retirement, bore the burden of the war. The B-52F was employed first, then replaced by the B-52D. The D model underwent special modification to increase its conventional weapon capability and make it by far the most suitable model for the role. Whereas the F model could carry twenty-seven 750-pound bombs internally, the modified D model could carry 42 of them or eighty-four 500-pound bombs. With the external load of twenty-four 500-pound bombs, this put the maximum load at 60,000 pounds.³⁶ In 1972 during the Linebacker operation, approximately 100 G models joined the campaign. The B-52H, like the G model, until 1972 remained in nuclear deterrent posture and did not take part in Southeast Asia bombing.

The B-52 crews took part in the Southeast Asia operation on a rotational basis. Crews deployed for 6-month tours, usually by unit, and were augmented by crews from other model

B-52s, who received a 2-week indoctrination course on the D model and on conventional operations and then deployed. In this same manner, a great number of crews saw action, many returning on several such cycles.

The single true exercise of strategic bombing in Vietnam using B-52s was the Linebacker II operation of December 1972. The B-52s provided the backbone of an 11-day bombing campaign against Hanoi and Haiphong. These raids, which devastated the air defenses, transportation network, and petroleum storage areas of North Vietnam, had decisive results. The raids employed over half the active B-52 force and reversed many of the prior concepts about employing bombers in Southeast Asia. The flights over the North were a deliberate escalation; the issue of the B-52 vulnerability was tested; and 15 of the aircraft were shot down during the over 700 B-52 sorties.

The Linebacker II campaign was a remarkable effort that left a vivid last impression of how the B-52 could be employed in a conventional war. The vital centers of North Vietnam were decisively struck, bringing the results sought after for so long. The targets were hit precisely, with little damage to other areas of the city of Hanoi—an objective particularly desired to dispel the impression of widespread devastation associated with strategic bombing. Although North Vietnamese propaganda at the time sought to convince world opinion of the indiscriminate nature of the bombing, even using the North Vietnamese figures on casualties indicates the reverse of this. The Vietnamese claimed 1,318 civilian deaths in the 11-day campaign; compare this, for instance, with a week-long Hamburg raid in 1943 in which one-third of the tonnage dropped during Linebacker II caused 42,600 civilian deaths.³⁷ The civilian casualty figures during Linebacker II include, of course, not just B-52 strikes, but all fighter strikes. The bombs dropped by B-52s were gravity-fall bombs, the least accurate, whereas the fighters employed laser-guided bombs, so the aiming discipline of the B-52 crews is particularly noteworthy. Finally, the operation marked a significant departure from past practices, employing a large B-52 force, including the G

model, over a heavily defended target. Given the previous caution used in risking bombers, the operation stands in even more stark contrast.

The use of B-52s in the strategic bombing of North Vietnam was one role of the bomber's conventional activity, but there was another partially conflicting role. That role was derived from the use of B-52s in South Vietnam from 1965 to 1972 in bombing troop concentrations, including the close support of ground troops in battle. Over the years of the Vietnam war this activity became a well-defined and accepted role for bombers. The B-52s dropped bombs sometimes less than 1,000 feet from friendly forces in a close-support role. General Westmoreland, in fact, called the B-52 firepower the decisive force in breaking the siege of Khe Sanh in 1968.³⁸ These experiences established precedents that would guide planners thereafter and appear in present plans for bomber support in a conventional conflict.

What, in retrospect then, did the Vietnam war teach about conventional employment of bombers? Actually, it taught two contrasting employment concepts that even now coexist; they were the low-risk, limited-size strikes against troop concentrations, headquarters, and storage areas and the high-risk, large-scale bombardment of a country's strategic centers. These principles are contradictory in their claims on the limited bomber resources, particularly if the political and tactical situations make both sets of targets available. Based on the specific circumstances of a conflict, the concepts still remain to be resolved.

THE BOMBER'S ROLE AFTER VIETNAM

Following the Vietnam experience, the bombers underwent several upgrades of equipment to improve their capability for the nuclear role. The B-52G and H were put through an extensive modernization program to cope with Soviet defenses: an electro-optical viewing system for better low-level flying capability, more modern electronic countermeasures

equipment, and nuclear air-to-surface missiles, the short-range attack missile (SRAM). All were designed to enhance the bomber's penetrative ability. All earlier model B-52s were retired or taken out of active service except for 80 D models. These aircraft, structurally strengthened to extend their service life, again took a full part in the nuclear role but retained an ability to engage in conventional bombing. They became responsible for SAC's nonnuclear contingency plans. Meanwhile, the ongoing development studies to design a follow-on bomber to the B-52 received renewed emphasis. The AMPSS studies were expanded in 1969, and the Advanced Manned Strategic Aircraft (AMSA), as it was called, became the B-1, with contracts for its development signed in 1970. The first B-1 flew in 1974, and plans were set for full production of 240 aircraft beginning in 1976.

Instead of going according to plan, the B-1 proceeded to be an issue such as the B-70 had been in the previous decade. This was another aircraft designed for a specific purpose, nuclear strike missions as part of the strategic triad. In a time of budget problems and questions of the B-1's capability, the case against the aircraft grew. This was a \$20 billion program designed for a specific role that many said could be reduced to that of stand-off missile carrier, given the projected capabilities of future Soviet radar SAM systems. Seen as only one part, and not a dominant part, of the strategic offensive force, the B-1 found itself with less than a compelling case. A Brookings Institution report of 1976, looking at the strategic alternatives, defined "the primary purpose of the bomber force as that of ensuring against the failure of the retaliatory capability of the US missile force."³⁹ A \$20 billion back-up to what was viewed as a more dependable system was seen as no bargain. With the bomber defined in only those terms, several cheaper alternatives were available. President Carter, with Secretary of Defense Harold Brown's concurrence, cancelled the B-1 program in June 1977; he opted instead for a force of B-52s with cruise missiles to form the future manned portion of the triad.

Four years after the B-1 cancellation, a modified B-1, the B-1B, was approved for a 100-aircraft purchase. There were several reasons for the change of policy; some involved the aircraft itself and others, a changed domestic and international situation. Growing fear of the Soviet arms buildup, the Soviet aggression in Afghanistan, and revolution in Iran prompted a US military modernization, first in the later years of the Carter administration, then continued under the Reagan administration, when the B-1 was approved for production. Also, changes in the B-1 made it more appealing. Modifications made the aircraft cheaper (relatively) and although less oriented to performing its original role, more versatile. These changes were made to meet new criteria. As detailed by a DOD study on future strategic bomber development, "the conclusion was that the nation's next strategic bomber should have multi-mission capability, rather than a single dedicated role." The multi-mission capability mentioned was definitely meant as more than multi-nuclear mission. Congress also made this clear in the appropriations bill funding the B-1B; the bill stipulated that the bomber be capable as a nuclear weapons delivery platform, cruise missile carrier, and a conventional bomber.⁴⁰

One aspect of the new B-1B, its "stealth" technology, has far-reaching implications and has provided a new outlook on a bomber's vulnerability. The B-1B bomber's low radar signature is reputed to be only one-tenth of the radar cross-section of the B-1A, and one-one hundredth that of the B-52. By the mid-1970s, the popular wisdom was that a penetrating bomber's days were limited, regardless of speed or electronic countermeasure protection, and the advantage was all with the ballistic missile. Now, with the vulnerability of fixed-based missiles an issue and the possibility that bombers might not be detectable on radar, a shift to dependence on missiles, a trend that began around 1960, has stalled at least temporarily. Using bombers in the NATO theater is again a possibility, as is any role from which the bomber was once eliminated because of its vulnerability. How far bombers can go in reclaiming roles lost because of the one role concentration is

still undefined. Still to be heard, too, is the potential for improved radar equipment which would take even the smallest radar return and greatly enhance its display. Stealth technology is but one aspect bearing upon an aircraft's capability. The DOD bomber development study emphasizing a multi-mission aircraft does mark a new direction, however.

THE CONVENTIONAL ROLES

The nuclear deterrence mission has been the basis of all post-World War II military strategy and has provided a crucial role for the long-range bomber. A side effect of this concentration has been a relegation of other missions to secondary status, where they have not prospered. Most often these other missions were regarded as impediments to the nuclear mission.

The trend away from other missions was most apparent in maritime employment. During World War II, long-range bombers played key roles in antisubmarine warfare (ASW) and aerial mining. In World War II, long-range bombers were second only to carrier aircraft in destroying enemy submarines; unfortunately, this employment also provided one of the worst examples of Navy-AAF cooperation, a situation which led the AAF to turn over all ASW-equipped B-24s to the Navy and to concede this mission. In 1945 when the Navy asked the AAF for B-29s to modify for ASW employment, the AAF claimed a priority for strategic bombing and kept all B-29s in the AAF.⁴¹ The Navy did secure the use of AAF B-29s for aerial mining, and the mining had a dramatic effect. The bombers undertook an extensive mining campaign in the waters of Japan's home islands. The campaign paralyzed essential Japanese water traffic; some high-ranking Japanese officials rated the effect as great as the B-29 bombing raids on Japan.

The results of the mining were remarkable, considering the resources used—one wing of B-29s, flying 1,500 missions in 5 months, most often 30 sorties at a time, spread over 50 mission-days. There was a shortage of mines, particularly the modern acoustic and pressure mines; the tactics were flawed

and reflected the crews' inexperience; still, the success was almost complete. Japan, an island nation beset by many problems in 1945, obviously provided an exceptional case, but the precedent was still not to be ignored.⁴²

Despite the bomber's maritime involvement during the war, only a low level of activity went on afterwards. In 1946, the 307th Bomb Group at MacDill Air Force Base, Florida, became the only SAC organization with a maritime mission, that of sea search and ASW; aerial mining was not included until a year later. The 307th was to act as a laboratory to develop tactics and eventually train bomb groups, an excellent approach, but other matters overwhelmed the plan. Units did begin to deploy to MacDill for the training during the first year, but training slackened in June 1947 when one squadron of the 307th was transferred to another group; in June 1948, during the Berlin Blockade, the group as a whole deployed to England, and not in a maritime role.

In the fall of 1948, a Navy conference directed a change in tactics; because there was no capability to detect Soviet submarines from the air effectively, the Navy would attack the submarines in their ports instead. At this point, SAC returned the 307th to a primary bombing mission, making mining and ASW activity secondary. In 1950, concerned about diverting crews and aircraft away from strategic bombing, SAC informed the Navy that bombers for maritime roles could not be counted on in the initial stages of a war, only later.⁴³ This was similar language to that used in retreating from theater support of ground forces.

The beginning of the end of maritime activity came with the Korean war. The 307th deployed to Okinawa, the group's maritime responsibilities being assumed by the 305th Bomb Group, a unit that was about to receive B-47s. In 1952, ASW was eliminated as a responsibility; aerial mining continued to be a capability of the B-29s, but the role died with that aircraft in 1954. Active cooperation in a maritime role did not appear again until the 1970s.

The long-range bomber's post-war experience with conventional bombing was more continuous but a low priority also. The conventional roles vied not only with the nuclear role but with a doctrine of strategic bombing that viewed employment on tactical targets as inefficient.

In Korea, where a wide range of tactical situations existed for employing airpower, SAC saw the experience only as the wrong war and the wrong targets, rather than as a laboratory to test the bombers. This attitude caused a lost opportunity for experience when there was much to be gained. Because of the jet fighter threat, the bomber had to develop night and bad weather bombing techniques using radio and ground radar-directed releases. These were tactics requiring excellent communication and coordination. The bombs employed were, for the most part, gravity bombs, but radio-guided glide bombs were also tested. These weapons, the 1,000-pound rason bomb and the 12,000-pound tarzon bomb, were controlled by radio signals to tail fins for correction of range and azimuth. The B-29s developed tactics for using radio-guided bombs successfully for destroying bridges and other hard, precise targets. Thirty tarzon bomb drops, for example, destroyed six bridges and damaged one other. After only a few months of tests, the use of the bomb was suspended because of a problem in safely jettisoning it in an emergency. Instead of quickly addressing a rather elementary problem, SAC discontinued the program.⁴⁴

Still, other tactical lessons had been learned about compressing the bomber stream for maximum defense; electronic countermeasure procedures that cut bomber losses by as much as an estimated two-thirds; and the effects of poor quality maps on bombing accuracy.⁴⁵ Similar lessons were learned again in Vietnam. There was experience to be gained in all these areas, but more might have been learned and improved upon if there had not been an overriding notion that this war was the end of the line for the aircraft and the tactics.

During the 1950s, SAC essentially passed conventional bombing on to TAC, as all SAC aircraft became nuclear bomb-

ers. This development was easier than it might have been, because the theaters actively considered for warfighting were Europe and Korea, and both areas contained many air bases enabling fighters to come well-within range of theater targets. The more overriding reason, however, was the strategic imperative: SAC bombers with a nuclear role were making conventional roles unnecessary.

The flexible response strategy of the 1960s contained at least the possibility of using bombers in a conventional role as a part of the strategy, but too many trends opposed this: the lack of training and experience in SAC in this role, the race to build as many strategic weapon systems as possible to oppose Soviet forces, and the mental straitjacket of the "strategic retaliatory" category. In Vietnam, only with difficulty did the B-52 begin conventional employment.

In Vietnam, the bombers assumed roles similar to those seen in Korea. Ground radar-directed bombing again became a prime tactic. The bombs, too, were the same. Fighters began dropping laser-guided glide bombs, but streams of B-52s dropped only gravity bombs. Although the permissive air environment in South Vietnam would have allowed a variety of tactics, no real innovations were attempted. The entire crew training environment was against innovation in any case. Crews arrived for 3-month or 6-month duty with only the barest introduction to conventional tactics. In this situation, only modifications to nuclear bombing procedures could be successful.

The effects on the present and future bomber force of this new emphasis will of necessity be quite far reaching. The tactics, weapons, and procedures that support conventional roles, deemphasized for so long, now need attention. Basic questions arise of how bombers will be allocated, in what numbers, and to what purpose. A comprehensive conventional capability for bombers requires more than simply the crews' ability to drop conventional weapons. Concepts of operation and tactical thought must be applied to the subject of conventional force projection and to the role long absent from Air Force operations, maritime employment.

2. MARITIME EMPLOYMENT

Maritime employment presents particular difficulties for bombers. It projects these aircraft into a role in which they have not performed since World War II. Further, the role calls for thoroughly integrated operations with the US Navy, a Service with a potentially rival air force, both land based and sea based. Bombers have a familiar and historic relationship with land forces, but their relationship with naval forces and strategy has seen greater difficulties, complicated as it is by the highly specialized requirements for the aircraft and the degree of coordination necessary between air and sea elements. Further constraint has been brought about by the collateral designation of maritime support in Air Force operations, that is, the restrictions on funding this capability. Such funding constraints have left bombers short of realizing their potential for maritime roles. Even so, despite the conditions that prompted the previous neglect, bombers have increased their roles in maritime warfare, based in large part on a maritime threat that calls for a surmounting of prior difficulties.

THE GROWING NAVAL CHALLENGE

Maritime operations have become a central US military concern over the past decade, and that concern is likely to be a long-term one. The catalyst has been the rapid growth of the Soviet Navy into a global force, providing the US Navy with its first competition since World War II. The Soviet buildup has included all classes of ships, submarines, guided-missile cruis-

ers and destroyers, and four aircraft carriers, and the growing number of Soviet naval shipyards suggests even further fleet expansion. This fleet expansion challenge to the US Navy is a critical development, for although the United States remains a superior naval force, the prospect of Soviet naval parity has dire consequences for US strategy. If parity means that neither can use the sea lanes in the face of opposition from the other, then the United States is the comparative loser because the Soviet Union does not depend on this access. A further concern is the large number of Soviet Backfire bombers in the naval forces. Armed with antiship missiles, the Backfire is a threat to both the US Navy and all Western shipping. Soviet naval and air bases in Cuba, Angola, Ethiopia, and Vietnam give these aircraft virtually worldwide coverage. Because of the Soviet threat, the United States is now more aware than ever of the dependence of itself and its allies on foreign oil and other strategic resources. The oil crises of 1973 and 1979 heightened concern over this dependence.

The threat to US maritime interests posed by the Soviet naval expansion has been only one reason for the increased maritime orientation to US defense strategy. Projection of naval power historically has been a familiar thrust of US policy, and this emphasis on naval power meshed well with post-Vietnam war sentiment, reflecting as it did the tendency of the United States to shrink from committing ground forces to affect Third World disputes. Naval force presence provided a means to control strictly the level of US involvement in an area, a concern certain to remain preeminent with decision-makers as long as the Vietnam experience is remembered.

THE AIR FORCE'S PART IN NAVAL WARFARE

Active Air Force involvement in maritime strategy began in 1975, after a long hiatus. In that year, the Air Force and Navy concluded a memorandum of agreement which activated the Air Force's secondary or collateral responsibilities in maritime roles. The agreement established no new rules, but merely set up training procedures that for bombers had been

dormant since the Korean war. From 1950 SAC's maritime roles had reverted to "secondary responsibilities to maintain techniques."¹ From 1950 to 1975, SAC-Navy interaction was so low that the single noteworthy event of the era was a series of RB-47 and KC-97 flights looking for Soviet ships during the 1962 Cuban Missile Crisis.² There was a proposal in 1965-66 to retrofit the older B-52s due for retirement for use in aerial mining and sea surveillance, but nothing came of it.³

The 1975 memorandum of agreement set up coordination procedures for the Air Force to train with the Navy in various sea control activities. The roles considered in the agreement included sea surveillance, attack of surface and air units, and aerial minelaying. Although it is a collateral Air Force function, conducting ASW was not mentioned as a possible role.⁴ The omission of ASW activity from the agreement may have simply reflected the inability of bombers to train for such a role at the time, or it could have been an effort to avoid potential inter-Service rivalry. Hamlin Caldwell, a researcher at the Naval War College's Center for Advanced Research, concluded in a *US Naval Institute Proceedings* article on the memorandum of agreement that both lack of Air Force capability and protection of roles were involved. In Caldwell's view, ASW "is central to both the Navy's strategic deterrence and sea control reasons for being."⁵ In terms of promoting cooperation, the omission of ASW at least avoided bringing up the unhappy history of the Air Force in ASW roles, such as during World War II when the Army Air Forces left the field to the Navy after a series of doctrinal and control disputes.

For the SAC bomber force, the first effect of the Air Force-Navy agreement was the initiation of the "Busy Observer" program. This program involved certain B-52 units flying at least four ocean reconnaissance training missions every 6 months. This was a truly modest start in preparing the crews for any sort of expertise, but it did begin a familiarity, and combined with the attendant ground training, it provided a necessary first step in becoming involved with the tactics, communications, and reporting procedures of working with naval units.⁶

Soon after the sea surveillance training began, plans were laid to give the B-52s some offensive capability rather than just an observer role. Secretary of Defense James Schlesinger proposed arming the B-52D for a sea interdiction role, with several options to consider.⁷ Three weapons evaluated were the Harpoon (AGM-84A) antiship missile, the GBU-15 glide bomb, and a laser-guided MK 84 glide bomb. The Harpoon, a Navy-developed missile tested in 1975, subsequently went into production for use on a variety of Navy surface vessels, submarines, and aircraft. The missile has terminal radar guidance and a 500-pound warhead. The GBU-15, a follow-on to the "smart" bombs used in the Vietnam war, is an electro-optical-guided weapon usually built around the MK 84 2,000-pound bomb, but is a modular unit usable with other warheads. The weapon can be locked onto a target prior to launch or can be flown manually by the aircraft navigator to point of impact. The laser-guided MK 84 takes laser-designated commands from either the release aircraft or a second aircraft.⁸ In 1976, the Air Force opted for the GBU-15; several B-52Ds were modified for carriage and test of this weapon.⁹

Another step in B-52 involvement in maritime roles concerned training for delivery of aerial mines. In 1978, the Air Force and Navy conducted a joint test, preparing and loading mines aboard a B-52D at Pease Air Force Base, New Hampshire, followed by a test drop to determine accuracy.¹⁰ This test was a successful start to a series of exercises with the Navy, including practice releases in European waters and in the Pacific and the testing and certifying of all Navy mines for use aboard the B-52. Aerial mine delivery had long been a B-52 capability, but with the tests it took on much more significance as an active role.

Maritime training for B-52s entered an entirely new phase beginning in the fall of 1979 as a result of the Iranian crisis and Afghanistan invasion. This turbulence in Southwest Asia brought into focus the difficulty of maintaining a military capability, even a naval one, so far from home and from the established base structure of Europe and the Pacific.

As the US 7th Fleet operated in the Indian Ocean, B-52s began surveillance flights in the same region. Flying initially from Guam and later from Darwin, Australia, B-52s worked in conjunction with US naval forces in both reconnaissance and training missions. The distance involved required flight durations of approximately 30 hours, but the B-52s were able to accomplish these flights on a routine basis. One mission, designed to demonstrate the B-52's capabilities, saw two B-52Hs launch from K.I. Sawyer Air Force Base, Michigan, fly east to take part in surveillance training in the Indian Ocean, and then continue around the world to land again at K.I. Sawyer, nonstop.¹¹

Through the Indian Ocean training and the greater attention drawn to maritime training, large numbers of B-52 crews became familiar with the sea surveillance role and with fleet activities. The US Navy in turn benefited from the B-52 activity by using these aircraft for intruder-intercept training. The B-52 acted in the role of a Soviet bomber attempting to penetrate the carrier battle group's defenses, simulating the launch of missiles, or decoying with electronic countermeasures. The activity provided realistic training for both US Navy ships and aircraft.

The B-52's maritime offensive capability took on a new life after 1980. The Harpoon missile displaced the GBU-15 as a test program, leading to a successful test firing of Harpoon missiles from a B-52G in 1983. This first offensive demonstration opens the way to the possible development of a more extensive program in the later 1980s. How this offensive capability will fit with the Navy's plans, however, is still an open question.

If the Air Force-Navy memorandum of agreement served as a start for joint activities, a later Air Force-Navy agreement in 1982 gave the cooperation even more backing. The latter agreement, signed by Air Force Chief of Staff General Charles Gabriel and Chief of Naval Operations Admiral James Watkins, established a program for joint maritime exercises involving E-3A airborne warning and control system (AWACS) aircraft, F-15s, and others as well as B-52s. The 1982 agree-

ment makes clear that Air Force assistance is needed specifically in defense of the sea lines of communication. In this effort, the 1982 agreement highlights a first priority of counterair operations (the AWACS aircraft and F-15s). The agreement also mentions antisurface-ship operations, but in a particularly guarded way:

The primary element will be a training program to include realistic joint training and exercise activity to insure that any capability established is viable within the current operational framework.¹²

This comment bears directly on the program of arming B-52s with Harpoon missiles and will affect that program's resolution, depending on how the B-52s fit in with the "current operational framework." As with the 1975 memorandum of agreement, sea surveillance and aerial mine laying are mentioned but are not elaborated. The emphasis for the present is counterair.

The Navy wants to use F-15s and AWACS aircraft as an additional way of dealing with the threat of attack from Backfire bombers. The AWACS can significantly enhance the carrier battle group's surveillance area, and the F-15s will provide long-range intercept capability. In the vital region for Navy operations in the Atlantic, the Greenland-Iceland-Norway gap, Iceland-stationed F-15s can command the passages through this region. In the Pacific too, the Navy has been wary of the Backfire threat, a point further brought home when Backfires made practice attacks on the carriers *Enterprise* and *Midway* during a US naval exercise in the northern Pacific. Backfires flew launch profiles to simulate launch of their 160-mile-range AS-4 (Kitchen) missiles against the carriers.¹³

BOMBER CAPABILITIES AND POTENTIAL

While the F-15s and AWACS aircraft have an immediate capability to reinforce naval power, the B-52 cannot yet contribute so directly. The possibilities are readily apparent, however. A two-ship B-52 formation can search 154,000 square

miles of ocean per hour. The B-52 can carry 12 Harpoon missiles on its wings; 8 more can be carried internally with a launcher installed. As another role, the aircraft can carry 20 or more mines. The B-1B would, of course, do even more in all of the above roles. In the near term, however, the B-52's offensive contribution is more one of potential.

Even carrying the Harpoon, the B-52 has only the start of an antiship capability. While the missile has a 50-mile range, the B-52 cannot positively identify what the target is at 50 miles. In a land war there is usually a definable front; that is, the enemy lies in a certain geographical area. At sea, such separations often do not exist. As one author put it, tactical naval action is more likely to resemble a basketball game than a football game.¹⁴ Effective targeting in this environment requires a positive identification of a target; for a B-52 this identification must be visual. In essence, the standoff capability is largely negated. Such a limitation applies not only to the B-52, of course; any true standoff missile carrier needs a radar capable of discriminating the identity of a target to be effective in naval warfare. The B-52's lack of a discriminating radar is a present limitation, but the B-52 has the size and lifting capacity to carry such equipment, a capacity few aircraft can duplicate. Recently, a study showed how to exploit this capability of the B-52.

The B-52's ability to carry and precisely deliver a conventional antiship weapon was one of the topics of an Air Force-sponsored study in 1982. The study's criteria specified an ability to identify targets at long range. Produced by the Boeing Company, this study includes projections on force levels required, radar modifications necessary, and suggested tactics and gives a clear picture of what is available to make the B-52 a true offensive weapon in a maritime mission.¹⁵

The concept for B-52 operations that the Boeing study considered had contained a scenario:

The NCA (National Command Authority) could launch the B-52 CSC (conventional standoff capability) force as a reconnaissance/strike mission, with instructions to monitor ... shipping lanes, choke points, etc.,

while remaining outside the enemy airspace. The enemy could be advised that our CSC force was being positioned to observe his actions and that any intervention on his part would be considered an act of aggression and would be countered by our forces. This action should provide credible deterrence.

Once hostilities start, the B-52 CSC force assists in sea control by flying escort for our troop and supply ships, establishing a sea barrier on blockades, and conducting armed surveillance and ship attack missions as necessary.¹⁶

The study did not focus on the missile the B-52 would carry, but noted that several would be acceptable. The report projected launch ranges of 100 miles and 150 miles, far exceeding the range of the Harpoon. Our US missiles now being developed, however, have these longer ranges, so such increases are not unrealistic. For instance, the AS-4 Kitchen missile now carried by the Soviet Backfire has a reported range of 160 miles.¹⁷ The B-52 could carry any of the missiles now under development, just as it can carry the 12-foot Harpoon missile. In short, carriage of the missiles will not present a problem; the B-52's need is for more capable radar equipment.

Designing new radar equipment for the B-52 would be a mammoth task, but an alternative is available—the equipment designed for the B-1B. The B-1B radar as it stands is a partial solution; it will be capable of detecting and selecting an individual target at ranges of 150 miles, but it will not be able to identify a ship. For this reason, the Boeing study projected a B-1 “growth” radar which would have increased power to detect and to classify small ships from large ships and, more significantly, would include inverse synthetic aperture radar capable of identifying the ship superstructure itself at ranges over 150 miles. This capability is not simply speculation; it is now available and planned for installation on Navy P-3 aircraft. Other added features of the growth radar would include longer range and wider angular radar coverage over the base radar.¹⁸

The study concluded that the B-52 modified with the B-1B growth radar and carrying standoff missiles could provide both a credible deterrent and, if necessary, accomplish a variety of naval strike missions, up to defeating a Soviet naval task force. The force level projected to accomplish this last objective was 26 B-52s.¹⁹ Allowing for modification time for the B-52s (67 B-52G models projected) and development of an advanced standoff weapon, the study projects an operational capability for this B-52 force in the late 1980s, generally coincident with the arrival of the B-1B. The 67 B-52s in this plan are already projected for release completely to the conventional role as the B-1B replaces them in the nuclear role.²⁰

Another option to modifying B-52s, one that would provide a longer term maritime weapons system, is employing the B-1B itself in a maritime role. The B-1B with its own growth radar could accomplish the projected B-52 maritime mission with several advantages, the principal ones being speed, payload, low radar cross-section, and overall lower vulnerability. The capability in either the B-52 or B-1B is there; the money for the modification and dedication of the aircraft to a maritime role are the key issues.

Basic to any discussion of the amount of money and time to devote to a role is the part that role would have in the overall strategy. While the Navy has said little concerning integrating the bomber role with the naval strategy, examining the strategy can give some clues about the Navy's orientation.

US NAVAL STRATEGY FOR CONVENTIONAL WAR

The US Navy's strategy is based on an aggressive maritime offensive to put maximum pressure on the Soviet fleet, if war should come. The strategy emphasizes confronting the Soviet fleet in all theaters. Further, the strategy advocates using the carrier battle groups to seal up and threaten the Soviet fleet in its home ports. The goals are to keep the Soviet Union on the defensive and to keep the sea lanes free by not allowing the Soviet fleet to reach those sea lanes. Based on this strategy, the Navy has determined a requirement for 15

carrier battle groups and for the ships to comprise them. The most capable (and expensive) ships are required, including notably, the "large-deck" carriers, since the assaults planned would subject the ships to the maximum danger. The essence of the strategy is fewer numbers of powerful ships to mass and attack the Soviet fleet and bases directly, thus freeing the sea lanes because the Soviets would be occupied on the defensive and could not reach them.

This offensive strategy is meant as a deterrent strategy, promising the Soviets as it does that small encounters will become big encounters. The strategy is also the basis for the Navy's concentration of force in the large carrier. The opposing view, argued by retired Admirals Elmo Zumwalt and Stansfield Turner, among others, favors a larger number of less-powerful ships to pursue a more global strategy of protecting sea lanes and not threatening Soviet ports or Soviet fleets directly.²¹ Such a strategy would forgo buying more of the large nuclear-powered carriers and substitute smaller, conventionally powered carriers and more high-speed patrol craft as the fleet of the future. Analyzing these arguments, John A. Williams points out that the Navy wants to do both, attack the Soviets and protect the sea lanes, but strategy dominated by the aircraft carrier will force them to do the former.²² This choice of the large carrier has several implications for bomber aircraft.

BOMBER ROLES AND US NAVAL STRATEGY

A strategy aimed at attacking the Soviet home ports has little room for B-52s or B-1s armed with missiles. More to the point, if the Navy is willing to decline purchasing more and diverse ships in order to build around large carriers, the Navy in turn will have little interest in underwriting B-52 radar upgrades to do the task that more Navy ships could do. On the other hand, a strategy aimed at Soviet home ports would have a place for bombers with aerial mines to seal up ports or the exit points for Soviet fleets.

A strategy based on protection of sea lanes would have more of a place for aircraft armed with missiles. A sea lane strategy would emphasize protecting convoys and guarding the approaches to sea lanes, a task in which long-range aircraft have some advantages over ships. Conversely in such a strategy, aerial mining would have a lesser role.

Because of the direction of naval strategy, the concept of employing bombers armed with antiship missiles "stands on two stools," and the concept has company on each. Bombers armed to fight surface combatants compete directly with the "large deck" carriers, both those in being and those proposed. Bombers armed to protect the sea lanes find themselves with even greater difficulties: submarines and aircraft (Backfires) pose the principal danger to the sea lanes; against these threats a bomber has little capability. Moreover, the Navy is devoting significant attention to defending against the sea lane threat. Against submarines, the Navy has both attack submarines and P-3 aircraft, a four-engine turboprop aircraft with sophisticated ASW equipment and now being armed with Harpoon missiles. The P-3 is more limited in speed, range, and payload than the B-52, and is not numerous enough to cover the sea lane threat, but it has the tremendous advantage of having crews experienced in ASW activities.²³ Meeting the Backfire threat is a task for carrier aviation and, as mentioned earlier, the F-15 and AWACS aircraft combination.

Based both on current strategy and the other forces available, bombers armed with missiles can produce no unique contribution to the naval battle, but they can provide an important complement to other forces. No other system can match the response time of a B-52 or B-1B to a distant region of the world. And if either bomber were modified to carry ISAR radar and long-range antiship missiles, its launch platform would contain significant advantages over any surface launcher.

Short of action involving a war with the Soviet Union, bombers could give the United States an extra dimension in pursuing a maritime strategy. One role could be that of a complement to the carrier battle groups that deploy to troublespots in the world. Boeing posited the use of bombers to provide

similar support to that carrier aviation would supply; in such a scenario, bombers would be on the scene in less than a day and would perform interdiction or troop support functions for the up to 5 days it could take to position tactical aircraft or take a battle group to arrive.²⁴ In more general cases, committed bombers could provide an immediate reaction to potential conflicts, much in the way aircraft carriers and AWACS aircraft dispatched to the scene do today. Before anything of this nature can take place, though, changes are needed in a bomber's capability and in the Navy's acceptance of an essentially different weapon system.

The limit of active Navy interest in bombers lies somewhere beyond reconnaissance, but short of being an integral offensive arm of the fleet. This level of interest is thoroughly understandable, for the B-52's or B-1B's prospects for a true offensive capability are based on committing funds to an equipment upgrade program, and if the B-52 achieves a capability it will be, at least initially, against surface targets, one of the lesser difficulties for naval forces. In summation, bombers would be able to reach a target area more quickly, but beyond a timely response they would provide no unique capability, once there. Furthermore, getting the offensive capability will involve spending money that somehow must affect Navy programs.

In the matter of joint operations, aerial mine laying occupies a curious intermediate position. Mining is an offensive capability, but it requires neither significant aircraft modification nor joint action with the Navy. Aerial mining is a land tactic as well as a naval tactic, for the delivery is little different from dropping a 500-pound bomb. It is the target that makes mining a naval mission. Naval expertise is required to select the drop area and the mine; from there the tactic is one of bomb release. Mining is an area of significant Service interaction, one in which Air Force already has gained significant mine-laying experience. Of all areas, mining is the one most favorable for further SAC involvement. Mine warfare has historically been treated as an orphan in the US Navy, and

though the weapon development has lagged since World War II, potential uses are greater now than ever.

Today, aerial mining holds a key to maritime strategy. Bombers could lay mines to contain a Soviet fleet, but the possibilities are also extensive in a limited war. As Frederick Sallagar pointed out in his study, mining is less provocative than bombing yet can have decisive results. The mining of Haiphong Harbor in 1972, for instance, completely closed the harbor for 300 days although no ship was sunk by a mine.²⁵ The Navy's recently introduced CAPTOR mines used in anti-submarine barriers offer yet another significant advance in the sea battle. Beyond a show of force, mining is probably the smallest incremental step an aircraft can take in projecting power; such control in a conflict could be essential.

For mining, the B-52 or B-1B are both excellent delivery vehicles. Either aircraft could deliver a large load of mines (20 or more by the B-52) almost anywhere in the world on short notice. Areas to be mined, except enemy ports, are less likely to be heavily defended and offer lower risk to the aircraft than a land mission. Competition with naval aircraft for the role exists there too, but at present the Navy has no aircraft or ships to deliver mines that do not also have a role in ASW or strike warfare.²⁶

OBSTACLE TO JOINT ACTION

As the previous discussion of naval strategy makes clear, the linking of bomber capabilities to a maritime strategy presents opportunities to exploit, but is not without sources of conflict. The potential problems arise both from conflicts as bombers move toward what heretofore have been tactical roles, as well as from inter-Service claims for control of certain roles and missions. Aerial mining provides one example, but a rather minor one. The significant problems become more likely as the level of involvement rises.

Sea surveillance is a successful joint Air Force-Navy involvement, but an incomplete one. The role is useful to the Navy, easily mastered by bomber crews, but ultimately an in-

efficient use of aircraft and crew. Taken by itself, the role does not justify the expense of the aircraft and crew, which is only partially employed. Furthermore, no great insights are needed to see that satellite reconnaissance might well make using bombers a needless exercise. To justify the use of trained crews and the capabilities of the aircraft, the role must be only a part of a reconnaissance/strike role. Such a role, however, will require not only developing missiles and tactics, but also confronting the collateral status of maritime missions.

The restriction of funding for collateral roles is much more than a simple legal technicality to be overcome. The collateral status goes to the heart of the roles and missions division between the Air Force and Navy in the late 1940s, a division carefully guarded ever since. To the Air Force what is an extension of sea surveillance to the more complete operation of defending the bomber and attacking the sighted hostile ship is to the Navy an encroachment on the naval antiship mission. An oversimplified approach defines this as Service bickering over missions; the more serious reality is a situation in which two Services waste money on separate approaches to the same goal or in which confusion reigns over what organization is responsible for a task.

Basic to the issue of joint roles is the question of control of bomber resources in a joint Air Force-Navy venture, a problem exacerbated if the aircraft employed retain a primary mission of nuclear weapon delivery. This issue of control returns to the problem voiced by General Momyer over the control of bombers in Southeast Asia. If the nuclear mission is a primary one for all bombers, the Navy will be faced with the unenviable task of preparing for contingencies, based on the use of fast-reaction bomber forces that may or may not be there. Just as General LeMay informed the Army in the 1950s that theater support could not be done in the initial stages of a war, the Navy could face a similar loss of support and could not base a strategy counting on such secondary mission forces.

A key problem of joint action could more easily come from one Service usurping the other's role, than from lack of support. Air Force initiatives into the maritime roles have been ac-

accompanied by a harmony between Air Force and Navy over the limits of each initiative and by talk of complementary missions and the need for joint planning. They have, in other words, managed to stay out of each other's way and not challenge each other's missions. If, however, in the midst of spending cuts, competing roles lead to the conclusion that an aircraft carrier can be cancelled or some number of bombers are not needed, Service cooperation will suffer a severe setback.

In spite of the problems provoked by relying on secondary forces, funding collateral functions, or intruding on another Service's turf, the reality is that certain maritime interests of the United States are best met by using Air Force along with Navy resources. For bombers, the problems are particularly acute because of the resource costs involved. While modifying and dedicating aircraft for a specific naval role has questionable justification, no role exists in such isolation. Naval missions of applying power at sea extend to include projecting power ashore and over land. In many respects, an antiship weapon system is close to being an antitank weapon system. The essence of the issue is the potential of bombers equipped for conventional war over sea or over land.

3. CONVENTIONAL ROLES ON LAND

The role of a manned bomber dropping conventional munitions in support of ground operations is one thoroughly familiar to the Air Force. Unlike the nascent maritime roles, there is significant experience to draw on, and there are well-known situations to work within. The role has some significant difficulties, however.

The Linebacker II operation of 1972 should have given the B-52's conventional role a tremendous boost. The B-52 raids had decisive results; the 2 percent attrition rate proved the bomber's defensibility and durability; and the civilian casualties were miniscule compared to similar World War II bombing raids. However, the success of this operation led to no conventional bombing resurgence. The operation was controversial and largely unappreciated at the time, and in the post-Vietnam period there was a reaction against the use of military force in any such contingency. The American public little understood the results of Linebacker II, and soon thereafter not only were the specifics of the campaign not remembered, but conventional bombing capability was diminished greatly.

Following the return of the B-52s from Southeast Asia in 1973 and the retirement of many of them, conventional bombing roles receded in importance. The SAC crews trained in conventional bombing only enough to be familiar with the weapons and tactics, not to be proficient in them, and the crew ratio (crews to aircraft) declined to reflect a commitment

only to that required for the nuclear mission.¹ The capacity to undertake conventional roles became acutely limited in terms of both aircraft and crews. The reversion was nowhere near as complete, however, as that seen after the Korean war. The spirit of the times was against involvement in local or limited wars, but the role of conventional bombing itself began to be regarded as having increasing utility.

The 1970s saw several diverse impulses affecting conventional roles. The condition of near nuclear parity between the United States and Soviet Union brought a realization that greater conventional capability was necessary. The cancellation of the B-1 program had further impacts. On the one hand, it meant that the few bombers available in the future would need careful husbanding to maintain that part of the triad and to serve as carriers for air-launched cruise missiles (ALCM). On the other hand, the B-1 cancellation signalled what was thought to be the end in the near future of the bomber's ability to penetrate Soviet airspace; this conclusion, in turn, led to a search for other roles for the B-52. There were even some suggestions of conventional uses for the B-1, given at a time when the system was under attack. Speaking in 1976, Air Force Chief of Staff David C. Jones talked about how a manned bomber contributed to deterrence "due to its versatile capability for a variety of nonnuclear missions." He even speculated on the use of a variant of an air-launched cruise missile with a conventional warhead.²

While considering standoff weapons for the future, gravity bombing tactics maintained a high priority. The B-52s participated in Tactical Air Command's Red Flag exercises in Nevada. Bombers flew low-level training routes and practiced conventional bombing releases, both at low and high altitude, on the range. This in itself took the training beyond the Vietnam experience because no low-altitude bombing had been attempted there. The training was also integrated more and more with fighter aircraft activity to simulate attacking and defending the bomber.

CONVENTIONAL ROLES AND NUCLEAR COMMITMENTS

The B-52s became a part of the war plans for several contingency operations in which bombers were to deploy in forward bases and provide conventional support for theater forces in Europe and Korea, familiar regions where American ground troops had long been committed. These plans, then, were not new initiatives but, rather, ways to add or sometimes substitute firepower for ground troops.

For the conventional bombing roles, the oldest remaining B-52s, the D models, assumed most of the responsibility. The B-52Ds had not gone through the extensive modifications to improve penetrating ability—the improved electronics countermeasures equipment package and environmental science equipment added in the G and H models, for instance. As a result, even though the D models had a lesser ability to penetrate Soviet airspace on a nuclear strike, they were still usable in less heavily defended areas, and the D models alone had been modified to carry large loads of conventional weapons.

An entirely new phase of the conventional bombing role opened in 1980 with the creation of the Strategic Projection Force (SPF). This concept took the tactics being practiced in Red Flag exercises and created a mobile force around the use of bombers in a conventional bombing role. To a far greater extent than in Korea or Vietnam, the SPF organized an entire employment concept around the use of B-52s. The SPF included elements to set up operations at a forward operating base, as well as reconnaissance and tanker aircraft. Significantly, the already conventional-weapon-modified B-52Ds and their trained crews were not used to comprise the SPF. The aircraft used were the most advanced B-52s, the H models.³ Such a diversion of these aircraft from the nuclear role was a significant variant from all past practices. While the aircraft retained a nuclear commitment, the SPF engaged in in-

creased conventional training, including large joint exercises such as the Bright Star operation cited earlier.

One practice was not altered. The SPF was formed at the same time as the Rapid Deployment Force (RDF), which consisted of Army and Marine ground forces, tactical fighters, and airlift support, among other elements. As in Southeast Asia employment and in line with the policy of the Commander-in-Chief, SAC retained nuclear assets; the SPF was formed separately from the RDF, although designed to work with it.

Although there has been a great resurgence of interest in conventional roles for bomber employment, this resurgence occurs at a time when many considerations make that employment ever more difficult. Considerations start with the number of aircraft available. The number of operational bombers is dramatically lower than it has ever been (240 B-52s) although, admittedly, the capability of the aircraft and training of the crews are improving. Add to this shortage the diversion of effort into maritime roles, and there is a distinct shortage of crews and aircraft to cover possible contingencies—not for a short-term deployment, perhaps, but certainly for any sustained operation.

The issue of sustained operations is not an idle one. A nuclear imbalance with the Soviet Union has driven planners to scrutinize more closely the flexible response strategy for deterrence. With the nuclear imbalance, the threat of escalation to nuclear may be seen as less credible to the USSR, so the emphasis in planning to confront the Soviets must be to plan on a sustained, conventional capability.⁴ The need to build a larger conventional deterrent force and make it credible requires committing sizeable sea, land, and air forces to conventional warfighting. In such a scenario, more than an ability to deploy a limited force of bombers or fighters is necessary.

Although the need is greater and the aircraft fewer, the trend in armaments is unfavorable and apparent in two areas. First, the capability of fighter interceptors and ground forces to shoot down aircraft has improved greatly. Soviet interceptors

with new air-to-air missiles and a "look down/shoot down" capability exist, and the Soviets have supplied many other countries with less versatile but still formidable aircraft.⁵ In the 1973 Arab-Israeli war, the Soviet SA-6, with a 37-mile range, was able to knock down Israeli aircraft.⁶ These missiles and even more advanced and portable missiles are established now in Third World countries through the extensive arms sales of both the Soviet Union and Western countries.⁷ A second armaments consideration is how relatively unchanged from Vietnam and earlier the striking power of bombers is. If the SPF is employed, it must still fly over the target and drop gravity-fall munitions. A difference now, of course, is that the aircraft can expect to encounter defenses with weapons and radar of significantly greater sophistication.

Against the strong, discouraging tide of better defenses, fewer attacking aircraft, and inferior munitions, bomber programs are beginning to offer some hope of redressing the balance and making the bomber role over land a more viable one for conventional employment. The introduction of the B-52H with its longer range, better bombing accuracy than the D model, and better penetrative ability is a first step.

The key to improving the offensive capability is better weapons. Relying on a bomber to fly over a target to be effective is less and less an acceptable tactic in all but the most permissive environments. The trend has been apparent for years and has resulted in whole families of standoff missiles. Precision-guided munitions (PGMs) have been in production for over 10 years, and the many technological advances in guidance, propellant, diversity of submunitions, and accuracy have produced improvements and greater sophistication year by year. Any review of missile technology and present missile programs confirms the exotic standoff missile features now available and the predictable advances possible in range and accuracy. Although precision bombs were employed by fighter aircraft in the Vietnam war, and vastly improved weapons are now standard armaments on fighters, bombers saw no such development. The reasons are many: in addition to the money involved, these advanced weapons require a level of crew

training and integration of tactics that until recently bombers have not pursued.

Precision standoff weapons, if adopted for use on bombers, require a rethinking of bomber tactics and a fresh look at the commitment to conventional operations. The changes are quite different from an upgrade in electronic countermeasures equipment. Use of precision weapons will require more than delivery at a certain point at a certain time. If the weapons are used as designed—that is, against a hard, pin-point target or a mobile one—the delivery aircraft requires a close acquaintance with the ground battle and often close coordination with ground forces. If the aircraft has the equipment on board to acquire and discriminate between targets, the equipment should be manned by crew members trained in terms of the land battle, not just on how to release bombs. If the weapons are released at ground direction, a new level of coordination between ground and air is necessary. In either case, training to use precision weapons will involve a considerable commitment.

Dropping PGMs also implies a new employment concept for the bomber. Past experience has shown that the advantage of a heavy bomber over a fighter aircraft was in the large load of bombs a heavy bomber could carry and drop on a single pass over the target and in the longer carrying distance. The fighter, on the other hand, could achieve better accuracy with a dive-bomb tactic and would be much less vulnerable because of its speed and maneuverability. With PGMs the bomber's range remains an advantage, but the target area profile changes. By definition these munitions rely on precision rather than volume; their precision comes from guidance after release. With PGMs the fighter's accuracy advantage disappears, and the bomber retains the advantage of carrying several times the payload and the ability to loiter in the area for an extended period while selecting multiple targets. However, a vital issue remaining is aircraft vulnerability. Here fighters retain a solid advantage unless the PGMs achieve a range that would keep the launch aircraft well away from ground and air defenses.

Before succumbing to the appeal and wonders of PGMs, one must remember these weapons are no panacea. First, they are not infallible, or invulnerable, or foolproof. Second, they are efficient for only certain targets (usually point targets); for many targets, gravity high-explosive bombs ("dumb" bombs as opposed to "smart" bombs) will continue to be the optimal weapons. Finally, the relatively high cost and limited quantities available of PGMs demand a selective use of them. As an example, the Harpoon missile had been in production by McDonnell Douglas Corporation for 5 years before the 1,500th was delivered in 1980. Production in 1981 was 40 missiles per month, with a capability of increase to 55 a month.⁸ With an average rate of expenditure of weapons in even a limited war, it is evident the limited scope such numbers of weapons would have. The cost and labor-intensive nature of building these high technology weapons will continue to keep them, by their nature, different from bullets, artillery rounds, or simpler bombs.

The decision over which platform has the advantage for PGM delivery, bomber or fighter, is only a part of a larger discussion on employment tactics. In the NATO environment, this discussion involves deciding whether missiles are to be air launched or ground launched with aircraft supplying only targeting information. There is a current debate in considering one such employment of this technique, the Assault Breaker concept.⁹

The debate over launch platform and extent of PGM's utility should not obscure the role that missiles have achieved in warfare or in plans for war. In a conventional war, large or small, missiles will be a prime weapon, whether fired from a ship, aircraft, or the shoulder. Nothing is clearer than if bombers are to be any part of conventional war, the balance of weapons must be redressed and new, "smart" munitions must be made available to bombers.

The Boeing study of 1982 looked at the question of employing precision, standoff missiles on B-52s in limited war scenarios. The study examined three situations of conflict, evaluating what kind of weapons and what number of B-52s

were needed to have a decisive influence on the conflict. The assumptions of the Boeing study were that 60 B-52Gs would be modified to carry the B-1B radar system and any one of several standoff missiles being developed. Further, the modified aircraft would compose three squadrons, one each at Andersen Air Force Base, Guam; Barksdale Air Force Base, Louisiana; and Loring Air Force Base, Maine. Each unit would be dedicated to conventional employment and be responsible for a certain geographic area of operation. A part of each unit would be placed on alert for launch within 6 hours to any area. The aircraft would deploy to forward bases or respond directly from their continental US bases.¹⁰

The three possible conflict situations in the Boeing study were (1) An Iraqi invasion of Kuwait and Saudi Arabia in which the B-52s were to slow or stop the invading forces until the main components of the RDJTF arrived to take over the battle; (2) An invasion of South Korea by the North, with B-52s conducting sustained bombing operations for the first 72 hours of the conflict; and (3) A Cuban-sponsored Nicaraguan invasion of Panama with B-52s performing armed surveillance and selected strike missions. In all three situations, the B-52s were to be the immediate response force, as no other RDF or response could be deployed in time. This relates to the likely normal posture of forces; the B-52s on conventional alert could be engaged within a day, but other deploying ground, air, or sea forces would take 3 to 5 days.¹¹

For the three scenarios, the size of B-52 force calculated ranged from 18 for the Iraqi conflict to 9 for the Korean and Nicaraguan conflicts. Only the Iraqi situation required use of a forward operating base, Ras Banas in Egypt in this case; with the Korean and Nicaraguan examples, the home bases of Andersen and Barksdale were suitable. The use of KC-135 tanker aircraft was required in all cases; the number of tankers varied from 5 to 11 aircraft in the three cases. The employment concepts varied, but the flexibility of operation was excellent, for instance, allowing the B-52s to remain on station for 8 hours in the Korean theater.¹²

The representative nature of the three conflict scenarios may come into question, but neither the specific tactics nor the precise damages are decisive factors in analyses. The overall conclusions of the employment would remain true despite the insertion of many variables. These conclusions concern technical and operational feasibility. First, there are a variety of missiles now under development which when combined with the existing B-1B radar would make the B-52 an effective force. The missiles projected were supersonic, with a B-52 able to carry 20 missiles. The B-1B radar would require only slight modification, fewer than required for the maritime employment.¹³ The force could be developed using existing force levels by modifying 60 B-52Gs or roughly 40 percent of the present B-52G force.

The Boeing study considers only the B-52 for conventional roles, not the B-1B. The period required for B-52 conversion would make the converted aircraft available at the same time the B-1Bs become operational, so the implications are clear: The B-1B would take over the nuclear role these modified B-52s would relinquish. The conventional use of the B-1B itself, of course, introduces the familiar problem of increasing the chances of success and reducing aircraft losses while risking a far more expensive weapon system. Discussion of which missiles and aircraft to use must consider the variable of the theater of employment: Europe, Korea, Latin America, or Central Command.

BOMBERS ARE A SPECIAL CASE

Introducing bombers into a conventional war in Europe brings up several difficult issues. The military strategy for the defense of Europe is one best stated in superlatives: Europe is the most vital foreign region to the United States; the land battle in Europe would be the most extensive of any possible US involvement; air defenses provided by Soviet fighters and surface-to-air missiles would present the supreme test; and a conventional conflict there has the greatest chance of escalating to nuclear war. Where the massive firepower of bombers is

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Introducing bombers into a conventional war in Europe brings up several difficult issues. The military strategy for the defense of Europe is one best stated in superlatives: Europe is the most vital foreign region to the United States; the land battle in Europe would be the most extensive of any possible US involvement; air defenses provided by Soviet fighters and surface-to-air missiles would present the supreme test; and a conventional conflict there has the greatest chance of escalating to nuclear war. Where the massive firepower of bombers is

required most, the bomber is most vulnerable and at the same time most needed for nuclear alert status.

The question of commitment of bombers would be a dilemma for the Joint Chiefs of Staff of whether to throw in all forces in an attempt to keep the war contained conventionally and in favorable position for NATO, or to maintain the bombers in the nuclear deterrent role. Two factors in deciding the direction of war would be the degree of air superiority achieved by NATO aircraft and the relative weight the bomber aircraft could add to the conventional battle. When the aircraft committed to NATO support were B-52D models without the upgraded penetration ability, one answer might have been given. If the aircraft are the B-52G or H, or even the B-1B, a new set of variables is inserted. If those aircraft are equipped with long-range PGMs, yet another decision is possible. Thus, although the decision on employment would hinge on the particular battle scenario, it is a decision requiring some resolution before any war begins. To leave a decision on committing a vital force to the time when the force must be committed puts the theater commander in an impossible position. The commander cannot plan on the bomber's employment, so that commander must choose other options. The bomber under those conditions would become an additional force, possibly available but undependable. No commander could afford to count on bombers—and bomber forces are too expensive and time consuming to train for such a contingency. Even while bombers train in NATO exercises, analyses of NATO strategy and wartime employment of forces rarely mention bombers. The reason is simple: bombers can be used in a contingency, but invoking that contingency is unlikely and will remain so as long as conventional employment remains a capability behind the primary nuclear role and as long as gravity bombs are the bomber's only conventional weapon.

Some elaboration on using bombers in various contingencies is necessary here because the allocation of bombers is not the same as for other forces. Bombers are a special case, not because of their unbounded value but because of the particular circumstances of when they would be either used or

withheld. The European scenario is a good example. The theater commander faces uncertainties over what forces are available for use, based on the world situation and the needs of other theaters; a commander will, of course, have to adjust to these variables. In considering bombers in Europe, however, conditions are exactly opposite to those normally encountered. A crisis in Europe would call for a maximum alert posture for all nuclear bombers. Because of the bomber's nuclear deterrent commitment, when the European situation is the most desperate, that is precisely the time when bombers are least likely to be available.

In the European theater what advantages over fighters might bombers have? There are several. First is range. Theater airlift and sealift to resupply the NATO forces are crucial problems in the defense of Europe. To ease this, bombers offer a capability to fly missions from continental US bases and recover at some intermediate base, in the Azores for instance, or with refueling to return to the continental US bases. With the overcrowded and possibly vulnerable bases in Europe, this could well be a decisive advantage. Even by deploying to Europe, bombers could fly from the more distant bases and still relieve the overcrowding. A second advantage is the on-board equipment and weapons load that bombers of the future could possess. The Army's view of the future, as stated in its projection in *Airland Battle 2000*, advances a strategy of isolating the first echelon of the Soviet advance through mobility of ground forces and by attacks on the depots, control centers, and airfields in the rear echelon. With long-range standoff missiles and the advanced B-1 radar in a modified B-52 or a B-1 itself, a bomber could provide a definite capability against such targets. The standoff capability is the key point, for air superiority will not be possible in this rear area or be complete enough to allow bombers to operate close to the front; the region would not be an appropriate target area for gravity bombs dropped from bombers. In orbit from standoff missile range, however, the B-52 or B-1 would be no more vulnerable than a TR-1 or AWACS aircraft, two aircraft now planned for employment.

Two conditions must be met if bombers are to be integrated into the NATO defense effort. The bomber must be capable of carrying standoff weapons and must have a multi-capable radar. Second, the bombers must not have a primary commitment to a nuclear role to tempt their recall.

Korea presents another possible use of bombers, but here the task is not as severe and the choices are not so stark as in Europe. A conflict in Korea would not provide the same danger of escalation to nuclear war. In addition, the Korean Peninsula presents a more controlled situation for the use of airpower; almost any Korean target can be reached on a short bomb run from friendly territory or ocean area. This geography would make local air superiority easier to obtain, and the defenses faced would make a general air superiority achievable. The more permissive environment increases the flexibility for using precision weapons or gravity bombs, depending on the target.

Reflecting this different environment, theater commanders have seen B-52s as more available and as important in the battle. In 1976, Lieutenant General Hollingsworth, then commander of I Corps (US-Korean Army Group), spoke directly about relying on B-52s from Guam to supply massive air support to stop a North Korean drive and quickly end the war.¹⁴ More recently, the Boeing study looked specifically at a North Korean attack and the effect of B-52s with standoff missiles against the second and third echelon units; the study computed a capability for destroying 30 percent of the invasion force.¹⁵ Korea is a theater where the B-52 would be useful modified or not, precision weapons or not.

The use of bombers in the SPF cannot be evaluated in the same terms as employments in Korea or Europe. Where Korea and Europe have well-defined criteria, the SPF faces a wide variety of possible employment areas on several continents; the use could extend to circumstances far different from either Korea or Europe; certainly the situation would not be as well known. The Boeing study cites two possibilities in two parts of the world, but these are far from inclusive. Roles

such as armed reconnaissance along a border or as part of an "air support only" assistance to an ally are possible in addition to the more traditional roles.

The more diverse the roles, the more necessary it is to provide the most flexibility in aircraft. The complexity of the mission itself makes this role a primary one for the organization involved. Just as in Europe, lending aircraft to fulfill worldwide commitments while maintaining the nuclear role as the primary one is a potentially dangerous half-measure.

For a scenario in the Persian Gulf region, or any area of like distance, basing is a distinct problem that the United States has seldom faced. The possibility of flight from the continental United States is all but effectively ruled out for any sustained operation or for more than a handful of aircraft because of the tanker requirements. Regardless of the difficulties, though, for an initial, sudden blow to an area, bombers could well be the only strike force available. Past experience has shown that anywhere in the world is within range. Using bomber bases local to the conflict also poses special problems to the SPF. In addition to the diplomatic campaign required whenever a B-52 lands in a foreign country, the B-52 is bedeviled by needs for unusually long and wide runways and considerable logistics and servicing support. The SPF has practiced deploying to bases and taking all support needed, but in a situation involving concurrent deployment by other Air Force and other Services' units, there are tremendous difficulties, perhaps serious enough to confound the operation. Because of these difficulties, in any operation requiring forward basing, the force must be as small and compact as possible; large formations carrying gravity bombs will be of diminishing value.

Not only in the SPF but in the more traditional missions in Europe and Korea, the weapons and the strategic nuclear environment have changed the way conventional roles are regarded. Relying on past experience alone can be a dangerous practice, both in planning and in not planning until a crisis arises. In Korea and Vietnam, bombers went to war with World

War II ordnance and only basic or improvised tactics. For future conflicts, the scarcity of aircraft, complexity of weapons, and consequent complexity of roles demand further concentration on conventional mission preparation.

CONCLUSION

FOCUSING ON THE BOMBER'S CONVENTIONAL ROLES

Change is difficult for a military organization, with the toughest changes being those that affect basic approaches to fighting. New weapons and technologies that only enhance or modify a tactic or role are often accepted readily. Changes that affect how aircraft are employed, however—in other words, the creation of a new role—are seldom accommodated easily. Projecting bombers into new conventional roles raises such difficulties.

With the new conventional weapons available and the increased requirements for conventional forces, the conventional role of the bomber becomes, in fact, a new and full-time role. The response so far has been to adjust and adapt but not embark on new paths. Needs for conventional applications press in on all sides while the bombers are pulled in many directions to meet the needs: the B-52D has long been in contingency plans; the B-52H is the bomber of the SPF; the B-52G is testing the use of Harpoon missiles; and the B-1B was accepted in part for its conventional applications. So far, however, the fundamental change of devoting bombers to conventional missions, with full-ranging weapons, tactics, and training needs addressed, has not been attempted. In fact, the inclination to do so may even be receding. Fashioning a conventional bomber force in a crisis has worked in the past; un-

fortunately, future tactical situations could easily make that policy unacceptable.

The last two wars in which bombers were employed conventionally are poor models for anticipating the future. In Korea and Vietnam, bombers planned for retirement were pressed into service using long-neglected tactics. In those wars, besides having a bomber force available which was not then a critical part of the nuclear deterrent force, the bombers had the luxury of operating in conditions of complete air superiority in the south while preparing for more demanding missions in the north. The air planners and commanders could count on a sufficient number of bombers without directly affecting the sufficiency of the bomber nuclear force. Even though there was minimum training, the conventional bomber force had the time and latitude to develop proficiency and flexible tactics. Linebacker II was a tremendously successful operation for the B-52s, but it is doubtful the B-52 crews could have executed the operation as well in 1965, even against the weaker defenses then in place. Continuing to rely on a system in which conventional tactics are only secondary mission priorities is gambling that the same permissive scenarios are the only ones that will develop. With subsequent changes in air defenses, fewer bombers, and increased complexity of weapons, that gamble is a poor one.

The conventional roles facing bombers confront several dimensions that need special attention. For one, the roles are distinctly joint in nature, as much as strategic bombing is distinctly unilateral. Both maritime and land projection roles demand close cooperation with Navy or Army and reliance on each's intelligence and communications systems. Even more a vital factor, these joint roles rely on another Service to seek the support of bombers in operations and to support the funding of such a force. The reverse of this issue is that the bomber force must be fully committed to and fully competent in the joint operation. This principle of mutual reliance and joint action outweighs any problem of technology as the key difficulty in attaining an effective conventional bomber force.

In another dimension, conventional employment converges the maritime and land projection roles. As a result of the growing influence of PGMs, the tactics and employment of aircraft against ships or against land targets take on similar forms and require similar crew expertise—extensive expertise at that. Already, of course, the techniques of aerial mining and other modes of bombing have been closely linked. Because the roles are so related, the scarcity of bombers and high degree of specialized crew training necessary strongly argue against a division of these responsibilities between units or models of aircraft. Any antiship role demands the use of precision munitions and the specialized radar capabilities described in the Boeing study. Although gravity bombing will still remain a tactic on land, relying on an SPF bomber force without a capability for PGMs or a classifying radar is to accept a weapon system of the past and one of limited use.

Yet another dimension in planning for an effective conventional force derives from the joint nature and the convergent aspects. The conventional bomber force must be dedicated to conventional roles, including extensive emphasis on developing tactics and the optimum weapons. The force needs an attack mission not just restricted to reconnaissance on either land or sea, and only a development program active in meeting all mission requirements will make the endeavor worthwhile. One specific requirement is a long-range (150 miles) air-to-surface missile to complement the range of the B-1B radar's targeting ability; such a capacity is vital for operating in the heavily defended European environment or against a naval battle group.

A further dimension of conventional use is the restricted size of the bomber force. Because of limited numbers the use of the force must be one of rapid reaction and projection, not sustained operations. This orientation is even more critical with the combination of land and maritime roles in single force, for there will be more than one claim for the bombers' use. Specifically restricting the role will help both in developing a doctrine of employment and in heading off potential conflicts within the Services from implications that bombers

are replacements for the sustained force of a carrier battle group, land forces, or even tactical air forces. Using bombers in a limited time reaction role is a large leap from previous concepts, so the process will not be easy.

Probably the greatest difficulty in achieving an actual capability in conventional roles is in making the first moves. Only true competence can justify dedication of the resources; only a dedicated and trained unit can produce that competence. The difficult solution is to set up a force with a limited capability and build the expertise for the future. Excessive claims now of the tank-killing or ship-killing ability of the force will only prejudice the training and development which must occur. New weapons are vital, but the conventional force can be just as far behind in training and tactics as in technology. Time, patience, and a dedication to joint training are basic to success.

Present trends do not augur well for attaining significant conventional capability. As in the past, the keystone is still the needs of the nuclear role—the place of the bomber in the triad. Though fewer, the bomber is today more highly regarded than it was 5 to 10 years ago. Through the envisioned enhancements of stealth technology and other defensive improvements, bombers are now seen as penetrators, through the 1990s. As an ALCM carrier, the bomber has also become what may be either the successor to the bomber's penetrating role or a partial but additional leg of the nuclear deterrent force. The ALCM, particularly with its new stealth features, is a weapon of much versatility and could emerge as a conventional weapon of the future. If it does, there will be a further claim on the manned bomber's use. The overall result of the resurgence of the manned portion of the triad is more demands on the bomber force and a consequent reluctance to allow the loss of these aircraft to other roles or to risk losing bombers while they perform in other roles.

Present programs for bomber development focus on the strengthening of the triad. Aircraft development programs and retirement schedules are volatile matters, and plans shift year by year. At present the schedule calls for a portion of the

B-52Gs to deploy ALCMs during the early 1980s and 100 B-1Bs to be delivered between 1985 and 1988. The B-1Bs will replace the B-52s in the penetrating role; in this same period, the B-52Hs will begin deploying ALCMs. In the early 1990s, a follow-on bomber, the advanced technology bomber (ATB) with stealth features, becomes the primary penetrator, allowing the 90 G models to retire and the FB-111s to transfer from SAC to employment with Tactical Air forces. Through the 1990s, the B-52Hs presumably will remain as ALCM carriers.¹ This is, at present, the general plan; the history of bomber development gives little reason to rely on such forecasts, but the intentions are clear.

The plans for the evolution of the conventional force are less distinct. The B-52Gs not modified for ALCM carriage, 60 aircraft, are scheduled to assume the former role of the D model and continue in this role into an indefinite future.² Presumably, the B-52H will pass the SPF role to the B-52G when the H model begins ALCM modification (in 1988). The B-52H or B-1B would be available for partial use in a conventional role in the 1980s and 1990s, but of necessity, that part would be limited.

As an update on future plans, recent developments in bomber programs contain several implications concerning the status of the conventional bomber force once ties are loosened from the nuclear role. In 1981, plans were for the five B-52D squadrons to continue in service until the B-1Bs were deployed, that is, until 1985 to 1988.³ In 1982, Air Force budget constraints forced three of the five squadrons to deactivate in that year instead, with the remaining two squadrons allowed to continue until the B-1Bs arrived.⁴ In 1983, the remaining two squadrons were deactivated, well in advance of the B-1B deployment.⁵ The progressive cutbacks and early elimination of these squadrons for lack of funds occurred during a period when Air Force budgets were increasing at the highest rate in years; the decline in bomber squadrons was, in fact, in marked contrast to the expanding number of total flying squadrons. Those cuts occurred in good times; in a time of

level or declining Air Force budgets, the effect on the succeeding conventional bomber force can well be imagined.

Indications are that conventional roles again are suffering the effects of receding attention and of the demands of the nuclear role. The B-52D was retired early. The B-52H model's role in the SPF will no doubt disappear during a transition of forces (when the H model becomes an ALCM carrier). The B-1B seems to be, despite its potential as a conventional bomber and the predictions made when it was approved for development, on a road of strictly triad involvement until at least the 1990s, when and if the ATB becomes a reality. Memories of the XB/RS-70 and the B-1A complicate that picture.

The emerging reality is that the conventional strength of bombers is again becoming the oldest and most expendable part of the bomber force, with increasing vulnerability in periods of constrained budgets. Keys to how viable the conventional force becomes will be the success of Harpoon or other such missile development, the acquisition of updated bomber radar equipment, and the operational status of a conventional bomber force in relation to the nuclear role of that force. Actions to prepare bombers for conventional roles are needed before a conflict occurs; otherwise those bombers will be prepared only for a conventional war of the past.

ENDNOTES

INTRODUCTION

1. The RDJTF became the United States Central Command as of 1 January 1983.
2. The term, "conventional," will be used to connote all variety of nonnuclear employments commonly associated with the term. No attempt is made in this monograph to differentiate between conventional and unconventional (meaning insurgencies or guerrilla warfare).
3. The force of approximately 60 FB-111s, while having conventional utility, is not considered here. The FB-111's more limited range and payload (one-third the range and one-half the payload of the B-52) put the aircraft in a different category from the B-52 or B-1B.

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2. Edwin L. Williams, Jr., *Legislative History of the AAF and USAF, 1941-1951*, USAF Historical Studies, no. 84 (Maxwell AFB: USAF Historical Division, 1955), p. 55; Robert Frank Futrell, *Ideas, Concepts, Doctrine: A History of Basic Thinking in the United States Air Force, 1907-1964*, 2 vols. (Air University: Aerospace Studies Institute, 1971), 1:218.
3. David A. Rosenberg, "The Origins of Overkill," *International Security* 7 (Spring 1983): 14.

4. Harry R. Borowski, ed., *A Hollow Threat: Strategic Air Power & Containment before Korea* (Westport, Conn.: Greenwood Press, 1982), p. 103. Borowski set the scene in this way: only those 27 of the 160 operational B-29s in SAC were adapted to carry atomic weapons. The Joint Chiefs of Staff estimated that 400 atomic bombs were necessary for a war, but even by mid-1948, the available teams could prepare only two bombs per day for combat operations (pp. 103-106).
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13. Futrell, *Ideas*, 1:308.
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17. Futrell, *Ideas*, 1:226.
18. Thomas K. Finletter, *Power and Policy* (New York: Harcourt Brace and Company, 1954), p. 257.
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21. Speech at Major USAF Commanders' Conference, 28-30 June 1957, cited in Futrell, *Ideas*, 1:398.
22. William A. Lucas and Raymond H. Dawson, *The Organizational Politics of Defense* (Pittsburgh: International Studies Association, University of Pittsburgh, 1974), p. 73.
23. Rosenberg, *Air Power*, pp. 264-67. The cancelled USS *United States* program was revived as the USS *Forrestal*.
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34. Ibid., p. 284.
35. Ibid., pp. 101-107.
36. Hopkins, *Development of SAC*, p. 130.

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45. *Ibid.*, pp. 385-392, 468, 469, 507, 572-575.

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2. *Ibid.*, p. 45.
3. *Ibid.*, pp. 45-48.
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6. Lieutenant Commander John R. Thompson, "USN-USAF Interaction for Ocean Surface Surveillance Using Land-Based Aircraft," Research Report (Naval War College Center for Advanced Research, 1979), p. 16.
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13. *Washington Post*, 9 November 1982.
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15. Boeing Military Airplane Company, *Phase III Technical Interchange Meeting, 9-10 December 1982, Conventional Standoff Capability* (Wichita, 1982). The information presented concerning the conventional capability is from the Boeing report (hereafter referred to as Boeing Study) and from the paper by Billy G. Nix (note 14), the Boeing project engineer directing the Boeing Study. The Boeing Study examined both maritime use and land projection. In this chapter, the maritime uses only will be drawn from the report. When quoted sentences are excerpts only, the omitted material concerns the land projection role.
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17. Taylor, *Jane's*, p. 688.
18. Boeing Study, pp. 165-174, 252, 262-263.
19. Ibid., pp. 208-216, 299-301. Tanker aircraft support is not mentioned but, depending on range from bases, would be a factor. The maritime scenario presented in the study is an Indian Ocean engagement with support bases of Ras Banas, Egypt and Diego Garcia. Under these conditions, 11 KC-135s were required to support the 26 B-52s (p. 213).
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CHAPTER 3

1. Monroe, Maye, and Webb, "Employment," pp. 81-82.

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10. Boeing Study, pp. 40-48.

11. *Ibid.*, pp. 84-92, 222-224, 232-236.

12. *Ibid.*, pp. 131, 225, 237.

13. *Ibid.*, pp. 21, 28-33.

14. Monroe, Maye, and Webb, "Employment," pp. 70-71.

15. Boeing Study, pp. 228-229.

CONCLUSION

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2. *Ibid.*, p. 224.

3. *Hearings before the Committee on Armed Services, United States Senate, Ninety-Seventh Congress, Second Session on S. 2248* (Washington: Government Printing Office, 1982), p. 113.

4. *Ibid.*

5. *Report of the Secretary of Defense*, p. 224.

ABBREVIATIONS

AAF	Army Air Forces
ALCM	air-launched cruise missile
AMPSS	advanced manned precision strike system
AMSA	Advanced Manned Strategic Aircraft
ASW	antisubmarine warfare
ATB	advanced technology bomber
AWACS	airborne warning and control system
CASF	Composite Air Strike Force
ICBM	intercontinental ballistic missile
JCS	Joint Chiefs of Staff
PGM	precision-guided missile
RDF	Rapid Deployment Force
RDJTF	Rapid Deployment Joint Task Force
SAC	Strategic Air Command
SAM	surface to air missile
SLBM	submarine-launched ballistic missile
SPF	Strategic Projection Force
SRAM	short-range attack missile
TAC	Tactical Air Command

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