Historical Study Number 105

B-52 OPERATIONS IN SOUTHEAST ASIA 1965 - 1966

A SUMMARY NARRATIVE

HISTORY AND RESEARCH DIVISION

HEADQUARTERS STRATEGIC AIR COMMAND

13 NOVEMBER 1967

TABLE OF CONTENTS

Introduction

This study was prepared in the belief that the SAC staff, and perhaps others less directly involved in the day-to-day business of operations planning and support, would find of some value a paper devoted to the command's experience in Southeast Asia bombing operations to date. The focus is on bombing operations. In order to keep the paper within manageable length it was decided not to include a discussion of the command's air refueling mission. Its importance demands a separate paper. This summary narrative is devoid of references to the primary materials from which it was written. Any who wish to examine the sources or require a fuller and more detailed treatment of the subject should consult the documentation in the SAC command history on file in the History and Research Division, Directorate of Information. Contingency operations continue so the story is without end. One can safely forecast additional volumes, their number depending upon the duration of SAC's commitment to the Vietnam War.

Origins of the Contingency Mission

Strategic Air Command had always possessed what might be termed a residual capability to deliver conventional bombs. It was not, however, as one might imagine, a mission to which the command gave much attention, at least not until the early 1960s. In fact, SAC had attempted to get the requirement for both the B-47 and B-52 to deliver conventional ordnance deleted but without success. Thus kits

of conventional bomb racks were purchased, sent to SAC bases, and stored. The training schedule also called for a number of crews to make an actual drop of conventional ordnance each training period. But it was not until the advent of the Kennedy Administration, and its general emphasis on improving the abilities of the armed forces to respond to situations too limited in nature to justify the use of nuclear weapons, that specific plans were prepared for using strategic bombers to deliver high explosives.

The first SAC operations plan to identify specific units and numbers of aircraft which might be called upon for a show of force or limited war operations using conventional ordnance was Operations Plan 52-62. Originated to meet a requirement expressed in the JCS Joint Strategic Capabilities Plan, this contingency plan (it also had a nuclear option) was completed in December 1961 and remained in effect between January 1962 and March 1963. In this plan 90 B-47s and 30 B-52s, with their tanker support, would be deployed overseas to the Middle or Far East to assist the theater operations of unified commanders. Succeeding plan 52-62 was 52-63 which was in effect from March 1963 until July 1964. It was a change from the previous plan only in the units asked and the number of aircraft to be used. It should be understood in connection with these early general contingency plans that the commitment was an on-call capability. The command's responsibilities for limited war operations were still largely unspecified, and to the middle of 1964 no contingency plan of any unified commander included specific provision for SAC conventional weapons support.

In early 1964 a definite acceleration in SAC contingency planning took place. Secretary McNamara told the then CINCSAC, General Power, that he would like to see SAC increase its conventional bombing potential. General Power was quite ready to do so. The situation in Southeast Asia, and the continued emphasis in national policy on flexibility in order to counter aggression at any so-called threshold of violence, had convinced him that SAC bombers should play a more prominent role in limited conflicts. He told the President of the RAND corporation:

> I am convinced that exploitation of SAC's potential for engaging in any level of conflict, with either nuclear or conventional weapons, would result in a greater economy in our national defense posture, produce more positive results, and increase national prestige by a clear demonstration of national resolve.

In July 1964 General Power formally recommended to General LeMay, then Chief of Staff USAF, that SAC be assigned an expanded role in contingency and limited war operations. A special study sent to the Chief of Staff emphasized the command's flexible capabilities in limited as well as general war, and asked that these capabilities be recognized in JCS planning as they had been in theater command plans. Headquarters USAF indicated it would review thoroughly the study and the new SAC contingency plan published on 1 July (OPLAN 52-65), but General McConnell, then Vice Chief of Staff, remained cautious about overemphasizing the limited war capability lest it lead to a major change in mission assignment. Also, the JCS had not reviewed SAC contingency plans to date because of their general nature. After some changes were made in the 52-65 plan as recommended by the Vice

Chief of Staff, in August SAC presented a series of briefings on its contingency plans to the Air Staff and the JCS. The favorable response led General Power to believe that the JCS now more fully understood SAC's non-nuclear capabilities and the potential contribution that strategic forces could make in a limited war.

The 52-65 plan was the most comprehensive contingency capability plan yet prepared by SAC. It provided alternatives for delivery of conventional or nuclear weapons, show of force missions, reconnaissance and other special missions. Annexes to the basic document covered mass sustained conventional operations; nuclear operations; and the special Global Flexible Response concept (a capability for selective application of nuclear or conventional weapons in geographic areas not readily accessible to the forces of the theater commanders). For mass and sustained conventional operations the 52-65 plan specified 30 B-52s, 90 B-47s, and supporting KC-135s. These would come from the 7th (15 B-52s), 320th (15 B-52Fs), 9th (22 B-47s), 100th (23 B-47s), 380th (22 B-47s) Bomb Wings, and the 98th Strategic Aerospace Wing (23 B-47s). In October 1964 the 2nd Bomb Wing replaced the 7th. The B-52s would operate out of Andersen AFB, Guam, and the B-47s and tankers from Kadena AB, Okinawa. Of special interest in the light of subsequent events, was the provision for a reduced force of 30 B-52s and 30 KC-135s (sometimes called the 30/30 concept) operating out of Andersen and Kadena, respectively, which was included as Annex H to the plan in December 1964.

Beginning in the spring of 1964, SAC conducted an extensive testing program to verify and improve its ability to deliver conventional munitions. In March and April B-47s and B-52s practiced dropping a variety of conventional bombs at Eglin AFB, Florida, and at three other ranges. The test series, known as Short Trip, examined bomb-aircraft separation characteristics, characteristics of the bomb after release, spacing during fall, and arming time; delivery tactics were developed; and bombing patterns and their accuracy were studied. Following these tests, in late May and early June SAC tested the feasibility of increasing the bomb carrying capacity of the B-52. Two sets of F-105 multiple ejector racks (MERS) were affixed to the Hound Dog (AGM-28) pylon on a B-52F. This permitted the aircraft to carry 24 additional 750 pound bombs and increased the total capacity of the B-52 from 27 to 51. Eight missions at the Eglin AFB range confirmed the ability of the B-52 to deliver this increased load of munitions. In a more realistic test (Project South Bay), the B-52 flew from Castle AFB, California, 5200 nautical miles to Nafutan Rock in the Mariana Islands, dropped a full load of live 750 pound bombs, and recovered at Andersen AFB. This proved the B-52's ability to strike targets at extended ranges from operating bases. The conventional bombing tests continued throughout the remainder of the year and during all of 1965 and 1966. It became a continuous program of testing new ordnance to insure its compatibility with the weapons system and evolving conventional tactics.

During the last half of 1964 tests were conducted at contingency units to make sure that the generation times specified in the 52-65 plan could be met. In July the 320th Bomb Wing, Mather AFB, California, loaded its 13 available B-52s with conventional bombs and was ready for launch 21 hours and 47 minutes after being alerted. This was well within the rates which had been established without actual testing. As a result the 52-65 generation rate was set at A hour plus 26 hours. Another test in November, after all aircraft had received the multiple ejector rack modification and the 2nd Bomb Wing had replaced the 7th in the plan,* was equally successful. This generation test of both contingency units had a special air of realism because it was ordered shortly after the Viet Cong had attacked Bien Hoa Air Base and had damaged or destroyed 20 B-57s. The exercise was actually a test of the reduced contingency force option (30/30 plan) which was officially to become part of the plan in December. Although the supporting tankers encountered cargo loading problems which delayed their generation, 15 bombers at both Mather and Barksdale were ready within 26 hours. These exercises were the last practice the contingency wings were to get, the next order to prepare aircraft and personnel for deployment was the real thing.

The 30 B-52Fs of the 2nd and 320th Wings were modified with external racks by Boeing field teams during the first three weeks in October at a cost of two million dollars. Scheduled for like modification at the end of the year were eight additional Fs destined as contingency force spares.

Deployment of Forces to the Pacific

It is perhaps a measure of the "unique" quality of the Vietnamese War that a series of successful guerrilla attacks could precipitate the deployment of B-52 bombers. As part of several so-called "reprisal" actions against North Vietnam (the most immediate and direct of which were carrier aircraft raids against targets in the southern part of that country), on 7 February the JCS alerted SAC to be prepared to carry out its responsibilities to conduct a night strike from Guam using 30 bombers against the major North Vietnamese jet airfield at Phuc Yen. The warning order flashed to the contingency wings specified adherence to Annex H of Operations Plan 52-65, or known more commonly as the 30/30 plan. This was followed 12 hours later by a generation order from USAF, which stipulated that preparations should be completed "as covertly as possible."

Despite the injunction of secretiveness, it is doubtful that the preparations for departure long remained a secret in the communities surrounding Mather and Barksdale AFBs. Activity at the bases quickened: nuclear weapons were unloaded from ground alert bombers and replaced with 27 750 pound bombs; external racks were affixed to the aircraft's pylons (no bombs would be carried on the wings during the trip to Guam however); support tankers were loaded with cargo; and the crews and augmentee personnel began the wait for an execution order.

They were to wait until 11 February. The JCS order for the movement to Guam as soon as possible came at 1440Z and headquarters

relayed it to the field with more specific instructions. Deployment hour was set at 11/1800Z. The nickname of the deployment was Arc Light. The first of the B-52s from Mather began departing at the specified hour. About three hours later the first bomber left Barksdale and by 2138Z all Arc Light bombers were on their way to Guam. The bombers proceeded directly to Andersen with one refueling enroute from a task force out of Castle AFB, California. The 30 deploying tankers, all serving as cargo carriers, took two routes to Okinawa. Five each from the 904th and 913th ARSs were routed through Eielson and then to Kadena. The remaining 20 went from their bases to Hickam, stopped at Andersen, and then proceeded to Kadena.

The flight to Guam was largely routine and uneventful. The 2BW did experience strong headwinds enroute which caused their commander to request that tankers be launched from Guam to rendezvous with the bombers 300 miles out. Five bombers had been forced to shut down engines and calculated they would have low fuel reserves upon reaching Guam. But as it turned out the winds abated and additional refuelings were not in fact needed. In the consummation of the tanker deployment to Kadena, five aircraft of the 913th met strong headwinds and were forced to make an unscheduled landing at Yokota Air Base, Japan, before proceeding to Okinawa. One tanker of the 913 ARS also was delayed when it had to shut down an engine and land at Castle for repairs. The first bomber from the 320BW landed at Andersen on 12 February at 0747Z and all 15 were down in an hour. Aircraft from Barksdale began arriving six hours later and all had arrived by 1444Z. Tanker arrivals at Kadena

were of course more spread out in time. The first arrived on 12 February at 1454Z and all had been recovered by 0754 on the thirteenth.

Immediately upon landing, aircraft began regeneration for the North Vietnam "reprisal" targets. This work was completed for 30 bombers and 32 tankers on 13/2205Z February. SAC headquarters was critical of this phase of the operation, although it did realize that more than normal maintenance had been required on arriving B-52s. The plan called for bombers to be ready in 10 hours and tankers in four. Some of the Guam aircraft were late, and at Kadena more than four hours was needed to generate 20 of the 30 tankers.

Answering this criticism, Third Air Division laid the blame for delay in bomber generation on failure of the bomb wings to launch maintenance teams and spares in four tankers eight hours in advance of deployment (as specified in Amendment 5, Appendix III, Annex H, SAC OPLAN 52-65, 1 Jan 65) so they would be in place to receive the bombers. The first tankers did not arrive until over two hours after the first bomber had landed. Also, tankers carrying munitions maintenance personnel and MJ-1 (bomb truck and adapter) equipment did not arrive until three hours after the first bomber. At the time Andersen had only three functioning MJ-1s. Andersen was also handicapped by a shortage of unloading equipment (high lifts and fork lifts), by saturated communications between the flight line and maintenance control which caused work delays, and excessive breakdowns in the lighting system illuminating the work areas. The Third also noted that SAC's decision to turn around

tankers bound for Kadena in minimum time instead of the planned 10 hours added to the confusion and problems of unloading.

Third Air Division was also critical of the performance of Kadena operations. It said that the 4252nd Strategic Wing was not familiar enough with the plan and therefore not sufficiently prepared to receive the deploying tankers. Although the wing had not initially been responsible for support of the 52-65 Operations Plan, Third Air Division said it had told Kadena to become familiar with it and then five days before the deployment had confirmed the wing's responsibilities. There clearly seems to have been a misunderstanding between Kadena and higher headquarters during the period immediately prior to the deployment. The 4252nd, up to the actual time the aircraft began arriving and even some time thereafter, believed that a control team would accompany the deployed aircraft and handle their generation to alert. The wing's commander, Colonel M. S. Tyler, was at SAC headquarters just prior to the time SAC was alerted and was told there that he should not be concerned with the contingency support but give his attention to building up his newly formed wing. Then when JCS ordered SAC to prepare to deploy the contingency force, Tyler was recalled from leave and sent back to Kadena posthaste. Fourteen hours before the first KC-135 touched down at Kadena Colonel Holly Andersen, Vice Commander of the 4252nd, was made commander of the Tanker Task Force.

The main criticism leveled at the 4252nd was that it was not organized well enough to receive the tankers. Colonel L. E. Richardson, Chief of SAC Operations and Training Division, who made an investigation

of the 52-65 operation after deployment, believed the task force commander lost control of the situation. That is, he and a small staff tried to handle it on a more or less ad hoc basis, with the result that while some were overworked to the point of exhaustion others were not used effectively. This on top of the earlier confusion as to responsibility, resulted in many tankers being generated late. While not trying to mitigate these initial problems at Kadena, they should be kept in perspective; at no time were Arc Light operations or support of theater forces jeopardized because of them. By the end of February, Third Air Division could report that Kadena had "an excellent operation."

Now that we have brought the contingency force to Guam it will be necessary to recall again what, initially at least, they were there for. As mentioned above, it was part of the United States' reaction to the latest in a series of attacks on U. S. forces in South Vietnam. Thus, the targets the crews studied were in North Vietnam. At the time of deployment SAC had 20 high priority targets in that country. Crews had complete contingency strike folders on two of these--Phuc Yen Airfield and a POL facility at Haiphong. Each unit had a master folder of 8 other targets and target materials were available on Guam for the remaining 10. Crews continued to study Phuc Yen and Haiphong after their arrival at Andersen, and were on six hour alert for launch. Several warning orders for the use of B-52s in the north were issued during the next few months, but they were all revoked. When contingency missions over South Vietnam began in June 1965 (these shall be discussed in detail later), they took priority and reprisal target preparation time was moved

ahead to 18 hours. To the end of 1966 at least, no reprisal targets were attacked by B-52s. Whatever contribution SAC might have made in the early stages of the USAF bombing program of North Vietnam, it soon became clear that as that country's air defenses improved, especially with the addition of more SAM missiles, the probability that B-52s would be used diminished. Considerations of the type of targets being attacked and the demonstrated capability of the more maneuverable fighter-bombers to accomplish their destruction were the main reasons why it was not believed necessary to use the heavy bombers, but to this must be added U. S. reluctance to provide North Vietnam with the opportunity for a propaganda victory should they shoot down one of the big bombers.

The Arc Light force remained on alert but uncommitted during the late winter and early spring. Training schedules of the two wings suffered because of a lack of aircraft and of facilities on Guam, and SAC became increasingly anxious about the effects of the indefinite alert on recurring training such as radar bombing and low level flying over terrain. Plainly in an attempt to ease the impact on its primary mission responsibilities, SAC proposed to reduce the force to 20 aircraft, with another 10 to be flown in from the states if needed. This brought a predictable no from the JCS. There was nothing to prevent SAC from rotating contingency wings, however, and this it did in April. The 7th Bomb Wing and the 7th Air Refueling Squadron replaced the 2nd Bomb Wing and the 913th ARS. The 320th Bomb Wing remained.

The command also directed further efforts toward giving the contingency force greater flexibility or adaptability for either a conventional or nuclear mission. Here it should be recalled that when the conventional B-52s arrived on Guam the island already harbored a nuclear alert force of 12 Stratofortresses. This operation had begun in April 1964 with the 22nd and 95th wings each providing six aircraft. Even before the movement of the contingency units, SAC had considered replacing the soon to be phased out B units with F units. That change had now been made, and SAC could further ask Air Force to approve a plan for the amalgamation of the contingency and SIOP missions. The plan, as prepared in the SAC Operations Division, would mix the bomb load of the F models with both MK-28 nuclear and M-117 conventional bombs. The aircraft would be loaded with nuclear weapons in the front bomb bay and conventional bombs in the aft bay and on the external racks. If a conventional strike were ordered, in a short time the nuclear weapons could be unloaded and conventional ordnance put in their place. Should a nuclear strike be ordered, the aircraft would launch with both conventional and nuclear weapons, but once over the ocean the externals would be jettisoned. After it had satisfied itself that such an arrangement would not endanger safety, USAF agreed to allow the so-called "dual loading" operation to go into effect 1 July 1965. Thus, during the early months of Arc Light bombing operations, when a mission was not scheduled, Third Air Division was required to dual load the aircraft. But as mission activity increased it became difficult to sustain this flexibility more than a few hours between strikes, and at a cost of overworking weapons loading teams.

By the end of 1965 the capability remained, but in reality increasing contingency operations had all but cancelled it out since usually time between missions was sufficient only to prepare for the next one.

Commitment of the B-52 to the Vietnam War

B-52s waited four months on Guam before being called into the war, but when they were called in it was not against the more traditional strategic targets in the North, but in the south against logistics bases of the Viet Cong guerrillas. We shall now consider the development of plans for these operations.

Military Assistance Command, Vietnam (MACV) seems to have been considering the use of SAC forces, along with several other alternatives, in 1964 as the situation in South Vietnam worsened, but no definite proposal was made. In February 1965, at the time of the Arc Light deployment, General William Westmoreland (COMUSMACV) asked that B-52s be directed against the Viet Cong base areas in South Vietnam. The Viet Cong were emerging from these secure bases in battalion size units and seriously challenging the South Vietnamese Government. Discussion on the subject as to how best the B-52 could serve reached into high governmental circles in early March. After the initiation of Rolling Thunder strikes against North Vietnam, Deputy Secretary of Defense Cyrus Vance, Secretary of the Air Force Zuckert, and several other USAF officials met to consider the use of B-52s for pattern bombing in either North or South Vietnam thus capitalizing on their ability to get above increasingly accurate communist ground fire. When the JCS

told SAC and PAC that consideration was being given to their use, neither command was enthusiastic. SAC said that since other forces were available to do the job, B-52s would be committed only when weather or other problems prevented attacks by tactical forces. PAC would prefer that SAC remain ready to attack North Vietnamese targets.

Then a particular air operation in mid-April seems to have taken the subject of how best to use B-52s out of the realm of speculation. In Operation Black Virgin MACV attempted to concentrate the firepower of tactical air in time and space against an area target in the Tay Ninh Mountains. It proved largely a failure. Air strikes were spread out over an entire day, thus diverting aircraft from direct support of ground operations and lessening the shock effect on the VC. The distribution of bombs on target was also poor. From this experience, General Westmoreland seems to have concluded that for attacks on Viet Cong base areas, which had a very high priority in his operational plans, the tactical aircraft then available were ill-suited. The B-52s seemed ideally suited to deliver a large amount of high explosive in a short period of time. The MACV commander got an opportunity to present his case to Secretary McNamara at a 19-20 April meeting in Hawaii. His arguments were obviously convincing, for shortly after the meeting Headquarters USAF notified SAC that the JCS would soon order preparations for the use of B-52s in South Vietnam. McNamara was to explain later " . . . the military commanders felt--and I believe that this was a proper use of the weapon--that these strikes would destroy certain of the Viet Cong base areas . . . there is no other feasible way of doing it."

SAC was cautious in its reply, it said that more testing would be necessary before the command was ready. Much would depend upon the availability and quality of radar returns (for use as offset aiming points in the aircraft's bombing-navigation system) from cultural and geographical features, but radar beacons could probably be used as an alternative. As predicted, in late April the JCS officially informed SAC and PAC that it was studying the possibilities of using B-52s as one means of "intensifying pressures" on the Viet Cong. The bombers could probably be most profitably employed against troop concentrations and installations in guerrilla held territory for which precise target information necessary for pinpoint bombing was not available. To this end SAC and PAC were to prepare and to coordinate plans.

There followed a month and a half of intensive planning and coordination of effort between the two commands. Their representatives gathered at PACOM headquarters on 6 May and reached an agreement on responsibility for targeting and on coordination procedures. SAC's main task would be to prepare the operations plan with the assistance of PAC. MACV was directed to provide information on potential target areas and to assist in developing timing, control procedures, and the necessary operational support. Following its return, the SAC team began to prepare a draft plan for attacking areas agreed upon in Hawaii.*

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*Target areas to which MACV gave priority were, in order, Kontum Province, War Zone Delta, Viet Cong Military Region 5 Headquarters, and War Zone Charlie.

Of special importance during the team's visit to the Pacific had been arrangements for placement of a radar beacon, the device to be used as an offset aiming point by the attacking bombers. In early May, SAC purchased three portable beacons (manufactured by Motorola and designated SST-133X radar transponder) and sent them to Guam for testing and flight crew training. They were then sent to South Vietnam, and plans prepared for them to be tested during a B-52 reconnaissance mission on the twenty-fourth. In addition to acquiring radar scope photography of the beacon signal, the recon B-52 would photograph potential target areas in Kontum Province and War Zone Delta to supplement MACV materials already in SAC hands. The JCS approved a single sortie (Short Sprint). The Government of South Vietnam had given its permission with the understanding that no aircraft would land in that country and the flight would be "as inconspicuous as practical."

In the early morning hours of 24 May (Saigon time) a B-52 of the 7th Bomb Wing flew the recon mission from Guam to South Vietnam and return. On both beacon runs the crew was able to pick up the signal. Two beacons had been mounted on a helicopter, one inside and one outside, and the craft hovered at 500 feet over Tan Son Nhut Air Base. The B-52 also obtained good photography of Kontum and War Zone Delta. The crew noted that in their judgment the Saigon area was the only significant cultural feature in South Vietnam and that terrain features would have to be used almost exclusively as offset aiming points.

By the middle of May MACV's plans regarding the use of heavy bombers had also become more definite. General Westmoreland's plans for

joint air-ground operations included three types of air attacks which were in effect three levels of intensity: (1) daily harassing strikes on a small scale which would not be followed up by ground action, (2) multiple strikes after which large forces of U. S. and South Vietnamese troops would sweep into the target areas, and (3) saturation bombing of Viet Cong base areas "hopefully every 10 days to 2 weeks." B-52s would be employed in this third category of operations, although the frequency of their use ". . . would be contingent upon ability and willingness of immediate follow-up by several battalions of ground forces who would stay in the area for several days and search the whole bombed area." Emphasized was the aircraft's unique ability to distribute a large amount of high explosive over a large area, in a well planned pattern, and within a short period of time. The aircraft's all-weather capability would also be especially valuable during the soon-to-arrive rainy season.

Although several targets in Kontum Province had by this time ripened (MACV noting that the province had become the focal point for infiltration into South Vietnam), SAC was not yet ready. A headquarters team with the draft operations plan did arrive at Hickam AFB, however, on 23 May to secure PACOM's coordination. Next day CINCPAC approved it and part of the SAC team then proceeded to South Vietnam for further briefings and coordination with U. S. officials in Saigon. MACV subsequently reported that all necessary procedures had been agreed upon. On 8 June SAC published its plan as Annex S to Supplement 3, Operations Plan 52-65.

In early June the most promising of three areas under consideration for B-52 strikes was the so-called Ben Cat Special Zone, in Binh Duong Province northwest of Saigon. It was a densely wooded area measuring two by four kilometers. In March 1965 the Air Force had been unsuccessful in an attempt to set fire to the forest cover (Operation Sherwood Forest). Heat generated by the napalm had triggered thunderstorms which had extinguished the flames. The area continued as a launching point for attacks against traffic on nearby Route 13. Within the zone, one and two story buildings had been discovered by aerial reconnaissance. MACV believed that up to three battalions of troops were located there, and that it served as headquarters for the Viet Cong Saigon-Cholon Military Committee which directed guerrilla operations in that part of South Vietnam. Following its request on 14 June for approval of the B-52 strike, the next day, MACV, after a final review of available intelligence, was convinced and asked that the mission be executed "to blunt [a] monsoon offensive in the area north of Saigon."

The JCS issued an alerting order to SAC on 14 June for a strike in the Ben Cat Special Zone. At this time SAC plans were already well along the way to completion. Based on preliminary information made available by MACV, it had earlier prepared a frag order and sent it to Guam and Kadena. Details in the form of amendments to the frag order were forwarded to Guam as more information became available, as were the inevitable changes in original instructions. By 14 June SAC could report that final mission planning would be complete with MACV's confirmation of the location of the beacon. We have noted earlier the emphasis

given to the beacon in planning between SAC and CINCPAC. It was of course one of the key factors affecting the outcome of the mission. Both the SAC and Third Air Division frag orders contained great detail on procedures for its use. SAC confirmed to PAC that the bomb run would be aborted if the beacon was not positively identified. Also, a safety feature added late in the planning phase at the request of the U. S. Ambassador to South Vietnam, Maxwell Taylor, was an air coordinator with the authority to call off the mission should he believe friendly troops or civilians were endangered by the bombing.

On 16 June the JCS ordered Arc Light I executed. Time over the target was to be 18 June at 0700 hours local Saigon time (17 June 2300 Zulu time). The target measured about one mile by two miles square. Twenty four of the B-52s were loaded with 51 750 pound general purpose bombs (M-117). Six aircraft each carried 27 1000 pound semi-armor piercing bombs (M-59) internally and the normal 24 750s externally. In all, 1530 bombs would leave Guam with the B-52s.

At 0259 local time (17/1659 Zulu time) on 18 June the first of 30 bombers (15 each from the 7th and 320th Bomb Wings) began leaving the island. The mission was uneventful until the aircraft approached the air refueling area in the South China Sea north and west of the island of Luzon, Republic of the Philippines. Just prior to meeting their tankers, the bombers flew a planned deviation south of some thunderstorms associated with Typhoon Dinah, then in the area. Unexpected tailwinds were encountered and it was soon apparent that the bombers

would gain time and arrive at the air refueling control point early unless some delaying actions were taken. To maintain their timing the bombers controlled their airspeed and did drifting maneuvers. One cell,* proceeding down its refueling track toward the air refueling control point (ARCP), was seven minutes early. After executing some S turns without losing sufficient time, the cell leader ordered a 360 degree turn to the left in order to arrive at the ARCP on time. After completing about 180 degrees of the turn, the cell passed through another group of three bombers on an adjacent refueling track. Unfortunately, the pilots of two aircraft, realizing they were on a collision course, both chose to put their aircraft in a descending maneuver. They collided and both fell into the sea. Five of 12 crew members from the two aircraft were picked up by an Air Rescue Service HU-16, but one was already dead from injuries. Because of heavy seas, the rescue amphibian could not take off and the survivors were transferred to a nearby ship. Several hours later they were again transferred to a Navy LSD and landed in the Philippines.

The remaining 28 B-52s proceeded on to the refueling phase of the mission. Here a bomber aborted because a mechanical malfunction prevented it from taking on the required amount of fuel. Thus the force which arrived over the target at 0645 Saigon time on 18 June was reduced to 27. The bomber cells were at various altitudes from 19,000 to 22,000 feet at bombs away. Of the 1530 bombs which left Guam, 153 did not get to the target because of the accident and the refueling abort. Now at the target, one aircraft did not release any internal bombs because his

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*The 30 aircraft were grouped into 10 cells of 3 aircraft each.

bomb bay doors would not open electrically. No external bombs were dropped either because the pilot feared the jolt which would result from their release might cause the internal bombs to drop on the closed doors. The 24 external bombs of Blue Cell leader would not release and one 750 pound bomb was found lying in the bomb bay (fortunately still safely fuzed) when the airplane got back to Guam. Two other aircraft each had one external bomb fail to release. In all, in approximately 30 minutes over the target the B-52s released 1299 bombs. During the return leg to Guam, Amber Cell Three aborted because of electrical and fuel transfer system malfunctions and landed at Clark AFB, Philippines. The remaining 26 aircraft began landing back at Andersen at 18/0443Z.

Arc Light I was not an auspicious beginning. The tragedy of the lives lost and the destruction of $16 million dollars worth of aircraft would have, even under the most favorable of circumstances, tended to overshadow all else. But in the case of Arc Light I it seemed the cost had been very high in relation to the results achieved. This was because little evidence could be found that the raid had hurt the Viet Cong. Three recon teams were airlifted into the target area at three separate points about 50 minutes after the bombing stopped. They spent only about four hours there; a detailed examination was not possible, it was claimed, because of the danger of ambush. In this limited sweep the teams found relatively few craters (although photo interpreters were later able to find over 900 craters in post-strike pictures) and no evidence that the raid itself had caused casualties or damage to installations. Several VC camps discovered were destroyed with explosives.

Some evidence was also found that an enemy battalion in the general target area had hastily departed when the bombing began.

Editorial comment in the press was generally critical of this unorthodox use of strategic aircraft (the analogy of "using a sledge hammer to kill gnats" found its way into print again), but the criticism tended to focus on the costly accident and the contrasting small loss to the enemy. As for CINCPAC and COMUSMACV, while they might have been disappointed that more was not accomplished, both considered Arc Light I successful. They chose to evaluate it within the context of the Vietnamese War itself, which, as one MACV officer pointed out " . . . is not a war of spectaculars, even with B-52s." MACV emphasized that the ordnance got there as planned, ground troops were able to penetrate an area heretofore considered unassailable without loss, and coordination was excellent. All the criticism did not, however, come from the press. The Third Air Division's liaison officer with the Second Air Division complained of the incomplete ground reconnaissance. Unless future missions were exploited more thoroughly " . . . I think we will be digging up trees once a week or oftener with no significant results." It will be recalled that MACV had attached great importance to the ability to exploit a target area after a B-52 raid. In this instance, however, MACV later explained that a large ground operation had not been planned because of the danger that a compromise of plans would reduce the shock effect of the bombing. Also, it had been considered unwise to commit large forces to this operation at a time when the VC were active throughout the country. He reaffirmed, however, his plan

to move major exploitation forces into areas lately bombed by B-52s and keep them there long enough to cover the target, to engage and defeat remaining VC forces, and to seek out and destroy remaining structures and supplies. But despite these good intentions, ground exploitation remained a sometime thing right on through 1966 for reasons we shall discuss later.

It should be emphasized here that the question of whether or not to continue the raids, since the first had proved disappointing, did not arise. This was because Arc Light I had not been conceived as a feasibility test; it had already been agreed that the B-52s could do the job. Also, if the Viet Cong were not home today, no matter, they would be home tomorrow. It was the B-52's mission to harass the VC, to disrupt his normal activities, to permit him no respite from danger even in his jungle redoubts, and to wear him down psychologically. The accomplishment of these aims pointed to a long campaign the end of which could not even be predicted. Within this context Arc Light I assumed its proper perspective.

Missions thus continued, until late August each one involving all 30 bombers on Guam. We shall proceed to them shortly. But it is believed that operations can be seen in better perspective if first some attention is given to a general description of the manner in which Arc Light missions were planned and carried out. Significant procedural changes, which occurred in 1966 as a result of greater decentralization of the program and the need for greater flexibility in mission execution, will be discussed later.

B-52 targets were prepared by the MACV Assistant Chief of Staff, Intelligence (J-2), initially in its Target Research Analysis Center and later, when the name was changed, by the Combined Intelligence Center, Vietnam (CICV). MACV's extensive intelligence gathering program blended the most modern photographic and radio detection techniques with the more traditional evaluation of captured documents and interrogations of prisoners, agents, defectors, and informers. Interestingly, photography itself provided justification for only a very small percentage of strikes within South Vietnam, because the VC moved in large part under the protection of the jungle canopy and used few vehicles whose movements could be followed. In Laos, however, where the enemy used large numbers of vehicles on infiltration routes marked by roads, bridges, truck parks, etc., photography was the most common means of developing targets.

When completed and approved by the Director of the CICV, a target made the rounds to J-2, J-3, and then to COMUSMACV. Characteristic of B-52 target planning was the direct personal interest taken in it by General Westmoreland, to the extent that he personally approved almost every one. This interest was traceable to the assurance he had given the JCS that the target he approved would fully justify the use of B-52s, and to the importance he himself gave the weapon system in defeating the enemy. B-52s then were Westmoreland's responsibility, so much so that the major USAF air component within his command, Second Air Division and later Seventh Air Force, had little or nothing to do with the targeting process.

Targets approved by Westmoreland were, at least during the first months of operation, reviewed closely at the highest levels of government. MACV's strike proposal went to CINCPAC and if he approved it went on to the JCS. While in Washington the OSD and the State Department also got a crack at it. Finally, the JCS reserved to itself mission execution authority. Upon occasion MACV was asked to provide additional information regarding a particular target before final approval was given. Actual cancellation of some strikes in Washington after targets had already undergone extensive study and coordination in Vietnam put MACV in a rather embarrassing position with the Vietnamese. Westmoreland complained that he, the commander on the ground, was in the best position to make what, at least to him, was essentially a military decision. But while one might sympathize with him on this issue the general's situation was not an atypical one: the use of airpower in the Vietnam War was under political constraints to an unparalleled degree.

Mission preparation did not await these decisions, however. The justification sent to PAC also went to SAC, which proceeded with its planning on the assumption that JCS would eventually approve the target. Lengthy instructions pertaining to the mission went into frag orders prepared by Headquarters SAC and Third Air Division and sent to a dozen other agencies directly associated with the mission. It contained such information as bomber routes and altitudes, mission timing, air refueling routes and procedures, bombing tactics, bomb fuzing instructions, communications, weather, and intelligence.

The terrain of South Vietnam presented peculiar problems for SAC planners. First of all, files of radar scope photography taken in Southeast Asia were sparse because of SAC's limited operational experience there. Also, there were few cultural features, e.g., large buildings and bridges, to give a good "return" on the radarscope. As mentioned earlier, during early Arc Light missions this deficiency of good reliable OAPs was made up by using a miniaturized radar beacon transponder mounted in pairs on an Army helicopter. The beacon's signal, which responded to an interrogating signal from the bomber, was used as a reference point by the bomb navigation system which then compensated for the distance to the target and made the bombing computations. There was never any doubt, however, that the beacon was only an interim solution to the problem. A helicopter hovering 400 to 500 feet above the ground was a very vulnerable target, so its use was limited to areas relatively safe from Viet Cong interference. As SAC's operational experience grew, and radar reconnaissance missions over South Vietnam increased, the amount of film available increased and more and more useable offset aiming points were identified. They were not the common cultural features of a western industrial nation which had become familiar to SAC crews in their normal training, but geographical such as an island, a jutting peninsula, a mountain top, a well defined bend in a river. These were used with increasing confidence in late 1965. By the end of the year, although occasionally the radar beacon was still used, a preponderance of the missions called for use of geographical offset aiming points.

The enemy's use of terrain was also an important consideration when planning missions. The skill and industry of the Viet Cong in preparing field fortifications, especially underground complexes, was almost legendary. They were most elaborate in areas like War Zones C and D that had been under VC control almost continuously since the French Indo-Chinese War, but wherever they moved the VC took precautions to entrench, often conscripting the local population to assist in the digging.

The B-52's contribution to the war was its area bombing capability. MACV provided target coordinates. Somewhere within this large area (the Arc Light I target consisted of 55.7 million square feet and in February 1966, despite improvements in target definition, the average area of a target was still 45 million square feet or roughly one and one-quarter square miles) were the target elements: the enemy's supply dumps, training facilities, headquarters, etc. Thus since the exact location of target elements was not known, and saturation of the target was out of the question with the resources available, targeting had to be based on the assumption that these elements were more or less evenly distributed throughout the target area. This assumption was fundamental to the area bombing theory. The attacker's bombs must then be as evenly distributed as possible to insure the highest probability of success. The track or path that each cell of three bombers would take over the target and the desired points of impact of their trains of bombs were predetermined to get the optimum coverage of the target area. The bomber's intervalometer (an electrical device in the bombing system preset to drop a desired number of bombs at a constant predetermined

interval) was set at 180 feet for the 750 pound bombs since the weapon had a lethal radius of about 90 feet. External bombs were dropped four at a time (two from each side of the aircraft) at 650 foot intervals. In general, internal weapons were fuzed for surface burst and external ones for subsurface burst. In extraordinary circumstances, for example when strikes were called in to support U. S. troops heavily engaged with the North Vietnamese in the Ia Drang Valley, all instantaneous fuzing was ordered. MACV always provided information as to what ratio of surface to subsurface bursts it wanted.

Following is a general description of a typical mission during the first months of the operation. Bombers launched from Guam by cell, that is three aircraft taking off at a time with one minute intervals between them. After climbing to altitude, the assembled mission flew at 31,000 to 33,000 feet enroute to the refueling area. The tankers launched about an hour after the bombers left Guam and flew south from Okinawa to the rendezvous. Two refueling areas were used initially--one was located off the northwest coast of the island of Luzon, Republic of the Philippines, the other further south below Manila. SAC found that its classic refueling procedure for EWO missions, the point rendezvous (individual bombers took separate tracks, homed in on its tanker, and linked up) was not feasible. Contingency missions were large and the size of the refueling area comparatively small because of the congested airspace in SEA. In response SAC developed the on-course rendezvous refueling procedure. In this tactic bombers and tankers came together at a predetermined common point after flying a timing triangle to adjust

their time over the entry point. Tankers passed through the entry point minutes before the bombers. Once past the entry point half of the bombers and tankers took a track south and half took one north and proceeded to refuel using standard buddy tactics (three tankers to three bombers). After completion of the refueling process the tankers climbed out and returned to base. A few landed at Clark AFB, Philippines to serve as emergency refuelers should a bomber develop trouble while returning to Guam. After the refueling, the bomber cells proceeded to target. At the target the bombers made their run one behind the other, in trail. Bombing altitudes were between 20,000 and 30,000 feet (when dispensing BLU-3B bomblets this was 12,000 feet). Care was taken that a consistent pattern of bombing at the same altitude did not develop. Neither did the missions take place consistently at any one time of day, although early morning was a favorite time in the hope of catching the maximum number of VC in their camps. Each bomber made a radar synchronous release of its weapons. Several alternative bombing methods were available for emergencies when a system malfunction precluded the normal method of release. These were developed as operational experience became greater, but during the first missions if an aircraft could not pick up the radar beacon, it had to withhold release. After bombs away the B-52s climbed away from the target area and returned to Guam, usually flying at 40,000 to 45,000 feet to conserve fuel.

Now, having considered the early planning for B-52 operations, and the first strike on 18 June 1965, and having summarized with almost embarrassing brevity the targeting and execution phases of a typical

mission, we shall next consider subsequent operations through the end of the year.

After one mission in June and five in July, Arc Light mission activity accelerated during the next five months roughly proportional to the expansion of the U. S. commitment to the Vietnam War. All missions to the middle of August were maximum efforts, that is all 30 bombers were used. But by that time MACV had ready a plan for using a smaller number of bombers, more frequently, in a planned program, while intermittently using the full force of 30. The plan, which by 16 August had been approved by the JCS and the South Vietnam Government, featured so-called Arc Light Zones. They were Viet Cong sanctuaries such as War Zone Delta, Viet Cong Military Region Five in Quang Tin Province, Viet Cong Military Region Nine in An Xuyen Province, and areas in Vinh Binh and Tay Ninh Provinces. With a minimum of coordination and approval MACV could schedule repeated attacks in these areas. When a high priority target presented itself this schedule would be interrupted and a maximum effort planned. As the Arc Light Zone attacks got going between 24-31 August, SAC in seven missions dropped 1549 tons of explosives on War Zone D and VC Headquarters Military Region Five.

Ground follow-up by troops was infrequent during these early months, despite General Westmoreland's stated intention to emphasize this part of the total mission effort. U. S. troops were still in short supply, and MACV felt only they could be counted upon to do a thorough job. Also, chances of a mission being compromised were great when the Vietnamese were brought in. MACV said in September " . . . at

least half of the air raids planned with follow-on ground exploitation are believed to have been compromised to some degree."

Disappointments were mixed with demonstrable successes. For example, on mission Mountain Trail, 30 B-52s hit a target in Quang Tin Province which appeared to be, from intelligence information, the main communications center for Viet Cong Headquarters Military Region Five. Ground search teams of Special Service Forces and Vietnamese Rangers went in after the attack and found a dummy radio station. Radio masts and antennas which had shown up in photos proved to be made of bamboo. No enemy was found. Perhaps in an attempt to make the best of a bad bargain, MACV chose to stress the intangible benefits derived from the strike:

> Although the primary objective of raiding an actual VC radio site was not achieved, the B-52 bombing continued to instill insecurity into the VC, in addition to destroying numerous facilities, the ground raid, which the VC certainly observed, should cause the VC to more closely guard their installations and force them to consider relocating important facilities wherever they believe they have been seen by aircraft flying overhead.

Sometimes intelligence was better and the results more satisfactory. For example, on 2 September 1965 30 B-52s hit a heavily jungled VC sanctuary in the Ho Bo Woods, in Binh Duong Province. Ground recon forces exploiting the target area discovered large stocks of supplies and ammunition partially exposed. Because they were unable to destroy it all, SAC returned again on 12 September with 18 bombers. According to MACV:

> The combined strikes have practically obliterated the Ho Bo Woods . . . The goal of the strikes was achieved in that extensive damage was done to this Viet Cong facility. The Ho Bo Woods was evidently an important supply base for the Viet Cong. This fact is supported by the construction of new trench systems around the woods after the first strike to possibly defend against another ground action by US or ARVN forces.

During the last half of the year the value of Okinawa as an alternate base of operations when weather threatened Guam was made manifest. In late July 30 B-52s flew to Kadena AB when a typhoon threatened Guam. They flew a mission from there and returned to their home field the next day. In early October, with Tropical Storm Carmen threatening Andersen AFB, B-52s launched from there, landed at Kadena, launched again from Kadena, and then returned home. The operational advantages of such flexibility during the summer months when storms crisscrossed the Pacific were obvious. Politically, however, the use of Okinawa was such a sensitive issue that it tended to override purely operational considerations. After the July raid the Government of Japan protested the use of the island for offensive operations in South Vietnam, saying it endangered Japan's neutrality. Commenting on the raid's repercussions, CINCPAC said that the U.S. must retain unqualified use of the Ryukus Islands. Okinawa was the only base to which B-52s could be evacuated and launched again should Guam be immobilized by weather. He suggested the U.S. remain firm and stand on its rights. CINCSAC agreed completely. To the Secretary of Defense the JCS recommended "unswerving support of our unlimited right to all necessary operational use of the Okinawa bases, without modifications, qualifications, or erosions." It did say, however, that

Kadena would be used only when weather prohibited use of Guam, because the political situation remained sensitive. The raids in October failed to raise any official comment from Japan.

Rarely did the schedule for Arc Light missions prepared by MACV hold up for more than a few days without interruption for higher priority strikes. An outstanding example of this was support of First Cavalry Division operations in the Central Highlands in mid-November. Pursuing the Viet Cong after the end of the siege of the Special Forces camp at Plei Me, the First Cavalry had run into elements of the regular North Vietnamese Army near the Cambodian border. The result was the Battle of the Ia Drang Valley, the first major encounter of the war between U.S. troops and the North Vietnamese Army. It was also to be the first time SAC provided direct support of troops engaged with the enemy. The First Calvary called for strikes as soon as possible against troop concentrations. A strike of 18 B-52s was flown on 15 November. On the sixteenth, with the First Cavalry still heavily engaged, MACV asked for additional strikes against the enemy's rear. Over a map of the battle area MACV placed a grid of two by three kilometer squares. SAC was to strike two of these targets every 24 hours. Targets chosen would depend upon the battle situation. Also asked for and received was permission for MACV to deal directly with Third Air Division to reduce the reaction time to the minimum. As a result SAC was able to be over the target about 15 hours after receipt of the order. In all, SAC supported the successful Silver Bayonet action with 96 sorties and almost 1800 tons of bombs dropped on suspected enemy positions and supply routes.

In December for a second time B-52s were called in to support troops, this time the marines. In Operation Harvest Moon marines and South Vietnamese troops sought to bring to battle two Viet Cong regiments which intelligence believed were preparing for attacks against South Vietnamese outposts and the marine base at Chu Lai. Struck in four raids were the base camps of the VC preparatory to the marine advance. Major General Walt (commanding Third Marine Amphibious Force) characterized their effect as "awesome to behold." More to the point, he emphasized that "The enemy has abandoned his prepared positions and much of his equipment in great confusion, and this is making our part of the job easier." From the numerous caves and extensive tunnel systems in the camp areas, the marines collected large and diverse stocks of equipment and supplies.

In the first half year of operations B-52s ranged from Quang Tri, South Vietnam's northernmost province, to An Xuyen, its southernmost province. The forces used ranged from 30 to 6 B-52s per mission. Of the 1611 sorties launched, all but 49 were effective over the target. The percentage of bombs not dropped was also low, less than four percent. As mentioned the standard ordnance used was the 750 pound bomb. In three missions in December the M-64 500 pound bomb replaced the M-117 in the bomber's internal bays as stocks of the latter were depleted. Also in December, SAC carried the BLU-3B fragmentation bomblet on four missions. Problems with the dispensing system resulted in ordnance hanging up in the aircraft bomb bay and jeopardized flying safety. SAC then discontinued using it until the necessary modifications could be made. Also, the usefulness of the bomblet against facilities dispersed and dug in

under the jungle canopy was questionable in SAC's opinion. Their greatest value would be in a situation analogous to the Silver Bayonet action when large numbers of the enemy could be located, or against logistical targets above ground and in open terrain. The combined weight of all ordnance dropped was almost 26,000 tons of high explosive. The cost of the bombs alone was high, set by the Secretary of Defense at $30,000 a sortie or $1 million for a 30 aircraft strike. But the Secretary also said that what the U. S. sought in South Vietnam was a limited political objective, and it would be accomplished at the lowest possible expenditure of lives, and not, he emphasized, with the lowest expenditure of money. General Westmoreland agreed that the cost of B-52 support was high, but added: "Although we have no figures, we suspect that a less effective fighter bomber effort on an area target, would cost as much, if not more."

At the end of 1965 SAC's 30 bomber contingency force was flying about 300 sorties a month in Southeast Asia. The ability to produce targets seemed to be the only thing which kept MACV from asking that the sortie rate be increased. In October it said that by April 1966 450 sorties could be accommodated and by July as many as 800. Passing through Guam in late October General McConnell told the Third Air Division commander that shortly there would be 60 bombers at Andersen. He was assured that SAC's 52-66 Contingency Plan was flexible enough to cover the possibilities of 450, 600, and 800 a month: Annex J provided for 50 aircraft on Guam to fly 600 sorties, and Annex H would send 70 bombers to the island to fly 800 sorties. But how fast and to what degree the

contingency forces could be expanded depended ultimately upon supply and facilities available. SAC said that additional facilities would be required at Andersen for anything over 450 sorties. Then there was the question of whether or not there would be sufficient bombs available to sustain the increased activity. Thus the command recommended not exceeding 450 sorties a month until March 1966. At the end of the year the JCS decided that for the immediate future at least the sortie rate would remain at 300 a month.

Not only was an increased weight of effort being considered for 1966, USAF was also looking around for more operating locations for the B-52 force. Of course the "quickest and surest way" of expanding the sortie rate was to put 70 airplanes at Andersen. If construction was on schedule, this could be done by 1 August 1966. Still, Andersen was 2500 miles from Southeast Asian targets. From an operational point of view, it would be better if at least some of the heavy bombers were based closer, say at Kadena. The shorter distance to target would mean less wear and tear on the aircraft, fewer tankers would be needed for support, and should the need arise Okinawa was a better base for operations against what USAF called "other Asian targets." SAC believed the best balance would be achieved with 20 B-52s at Kadena and 50 at Andersen. Availability of the Okinawan base depended on completion on date of a new base under construction in Thailand at Sattahip. Plans called for Kadena tankers to move there in July 1966. Of course before any decision was made to move bombers to Okinawa the political liabilities of such a move would have to be weighed against the military assets. Two other

possibilities being considered at the end of the year--Clark AB, Philippines, and Kung Kuan, Taiwan--would require an even more skillful adaptation of military requirements to political reality.

1966: The Year of Escalation

Discussions as to when and to what degree B-52 contingency operations could be increased continued into early 1966. As the quantity of his target intelligence increased, General Westmoreland reportedly had three times more targets than B-52s to attack them. During a high level strategy conference in Honolulu in February 1966 consideration was given to 450 sorties a month through June, 600 in July, and 800 beginning in August. Asked by the Secretary of Defense for a plan to achieve the 800 rate earlier than proposed in the Hawaii meeting, CINCPAC said: "The availability of munitions in support of B-52 operations represents the major problem with regard to reaching the 800 sortie per month rate at an early date." But even if additional ordnance was made available from worldwide stocks, Guam would not be able to accommodate the number of B-52s required for 800 sorties a month until August. For continuous operations CINCPAC said that the most desirable arrangement would be to have a full operational capability (70 bombers) at Andersen AFB; to use Kadena AB as a forward base for 30 of the 70 as soon as tankers there could be relocated in Thailand; and to put a recovery and launch capability for 30 B-52s into both Sattahip, Thailand, and Kung Kuan, Taiwan, at the time tanker facilities planned for these locations were constructed.

Munitions shortages, while the more immediate problem, would with time be erased as production caught up with expenditure. The basing issue, however, with its many political, logistical, operational, and economic ramifications, was more complex in the long run. For example, it was politically most practicable to operate B-52s only from Guam. From an operational standpoint, however, it was less desirable since it did create crowded conditions at Andersen AFB. In early 1966 Headquarters USAF and SAC favored moving 20 or 30 bombers from Guam to Kadena as soon as part of the tankers there could be moved to Ban U-Tapao, the new base under construction in Thailand. This split operation would mean a shorter time to target; the force could react quicker to strike requests against time sensitive targets; there would be a saving in B-52 operating costs; and tanker requirements would be lower. Into the summer the split of the 70 bomber force between Andersen and Kadena remained the official SAC formula for basing the optimum contingency force in the Pacific. But it was becoming increasingly evident that because of funding approval delays essential support facilities would not be ready at the Okinawan base until early in 1967. Should the command be ordered in the meantime to increase the force to 50 or 70 aircraft it would put them all on Guam. Still SAC emphasized that it could be more responsive to MACV requirements when the split was eventually achieved.

Also under consideration in early 1966 was the possibility of operating from Ban U-Tapao, Thailand, and Kung Kuan, Taiwan. In January SAC asked USAF for clarification of the requirement for bomber operations from these bases, already under construction for

use by KC-135s. Air Force replied that although they were being developed to accept B-52s, there was no plan for B-52s to use these bases except in an emergency or for weather evacuation. Admiral U.S.G. Sharp (CINCPAC) also emphasized the limited use which would be made of them. He told Secretary McNamara that modest additions to the runway and POL necessary to make the bases capable of receiving and launching B-52s should be funded, but because of the political implications involved " . . . considerations for a full operational capability in either of these countries is not desirable." Taiwan seemed to be the most sensitive politically. In March Assistant Secretary of Defense Cyrus Vance, visiting Guam, told the commander Third Air Division that heavy bomber operations from Nationalist Chinese territory were not politically acceptable and therefore B-52 construction probably would not be approved except for some long lead time items.

Basing flexibility received fresh emphasis from General Westmoreland in August as part of another request for an increased sortie rate and reduced reaction time. He said B-52s had not been as effective as they could have been because of the "necessity of dividing assets among two or more targets in an effort to satisfy requirements." Especially important now that contacts with the enemy were more frequent and of greater duration was reduced reaction time. MACV called Guam "barely adequate" to support the Vietnam War. He favored bringing the B-52s closer to the target, to Thailand, Taiwan, Okinawa, and the Philippines. He said: "We should capitalize on available assets and experience by providing more planes, more and closer bases, and sufficient stocks of munitions to support an increased effort."

These recommendations drew forth more discussion on the pros and cons of the various basing options. SAC stuck with the Andersen and Kadena split as the earliest way to get reduced reaction time. The Thailand base of course offered the greatest reduction in reaction time, and SAC recommended it be given priority in planning after Andersen and Kadena. Neither PACOM nor PACAF agreed with General Westmoreland on using a base in the Philippines, because of the expense and political uncertainty. PACOM saw Kadena as the earliest available base, although the improvement in reaction time over Guam was only a little over one-third. U-Tapao was closer to the target and construction could go forward with a contractor already on the scene. So a combination of these two appeared to be the quickest solution to the problem. PACAF emphasized that other factors such as the investment in Kadena and U-Tapao, would also have to be considered in the final decision. That command recommended using a three base arrangement--Andersen, Kadena, and U-Tapao--because it " . . . seemed more than adequate to provide the weight of effort and response needed to fulfill MACV objectives."

Using these recommendations as a basis, the JCS also considered how best to make Arc Light forces more responsive to MACV requirements. From its study came a 29 September memo to the Secretary of Defense from the Chairman of the JCS. He said basing at Kadena or U-Tapao offered "the most timely solution." Kadena construction was in progress and 30 B-52s could be there by 1 April 1967. Political approval might be difficult to obtain, however. It was recalled that although the United States had unrestricted military and administrative authority over the

Ryukyus Islands, its policy had been not to exercise those military rights in matters which might create a political crisis in Japan. Public criticism and some official dissatisfaction had been caused in the past by the launching of B-52s from Kadena when typhoons threatened Guam. Nevertheless, he requested that the State Department be asked to consider again the political implications of operating from Okinawa. As for U-Tapao, its closeness to South Vietnam targets would permit greater flexibility, weight of effort, and economy of operation. Politically, the position of the Royal Thailand Government would have to be reassessed since it had not agreed to basing any aircraft in its country which could not be identified as defensive in character. The Chairman recommended that the State Department be asked to get permission for construction of certain B-52 facilities at U-Tapao and to get agreement in principle for heavy bomber operations from Thailand.

The issue of B-52 basing options acquired a new dimension in early October as a result of Secretary McNamara's trip to the Far East. He asked that consideration be given to basing 15 B-52s in South Vietnam as a solution to the need for reduced reaction times. The JCS, with the help of the Air Force and the theater commands, was to consider forward deployment of the 15 as early as possible and at the least cost possible. This generated still another round of study. Upon consideration, it was generally agreed that if it was decided to move the heavy bombers into South Vietnam, the base at Tuy Hoa was the most feasible location. At a cost of some $22 million it could be ready in May or June 1967. However, this move was not recommended by any of the

commands concerned. Both General Westmoreland and General Momyer (Seventh Air Force commander) were reportedly against it. U-Tapao was now MACV's first choice for future basing. It was also the choice of PACOM, PACAF, and SAC. The lack of security was the big objection to South Vietnam basing. Comparatively speaking, the Tuy Hoa base was more secure than most in that country, but the big planes would be a most tempting target on the ground and while taking off. PACOM noted that the responsiveness of a South Vietnam based force to MACV requests would be improved only slightly over one based in Thailand. In early December the JCS forwarded to the Secretary a plan for basing bombers in South Vietnam, at Tuy Hoa. In an accompanying memo, however, it recommended U-Tapao.

By late 1966 then the Air Force's interest had focused on Thailand for forward basing of B-52s, although study of other possibilities continued. SAC said it preferred to begin with three aircraft and build up to 15 as facilities were improved. The cost of an austere forward operating base (FOB) would be about $11.5 million.* As has been mentioned, PACAF also supported early development

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This did not include PACAF's estimated cost of $3 million for improving port facilities. It also assumed completion of previously approved 1966 Supplemental Military Construction Program, that a decision to go ahead on bomber facilities would be made while the contractor currently at work there was still on the scene, and that facilities programmed for C-130 aircraft would be made available for SAC use.

of the base, beginning with the 15 bombers and expanding eventually to 30. But it cautioned against any development "at the expense of tactical air operations." The tanker mission still had first priority. In late November a Headquarters USAF Planning Group was reported to favor beginning operations 1 April 1967 with a 15 aircraft FOB. When construction of facilities for personnel and repair shops was complete, around 30 June, it would become a main base operation. The final 30 bomber MOB would be achieved about 1 September. This eventually was the program presented to Secretary McNamara by Secretary of the Air Force Brown. He sought approval of the ultimate goal of a main operating base (cost $35.7 million) by 1 September 1967. Three bombers, however could arrive as early as January to begin a shuttle operation. The 15 aircraft FOB would begin operations 1 April. To the end of 1966, the Secretary of Defense had not given his approval to begin operations from U-Tapao. In pursuance of this objective, however, diplomatic negotiations with the Royal Thailand Government were under way.

When the B-52s were eventually able to operate from forward bases the resulting reduction in space and time promised a much improved ability to respond to MACV's requirements. But for the more immediate future emphasis was on what could be done to increase the tactical flexibility of the Guam based force. As ground operations against the enemy grew and intensified, MACV became increasingly anxious that the mass of B-52 firepower be made more immediately available to field commanders. He emphasized the direct correlation between timeliness and effectiveness in the fluid battlefield situation.

As has already been mentioned, Arc Light operations during the early months required coordination and approval at the highest levels of government--Defense, State, and JCS. Of particular concern was the possibility of casualties to friendly forces or non-combatants which might result from incomplete consideration of all the factors involved. Proposed targets were scrutinized carefully and all had to be revalidated with the latest intelligence before approval was given to bomb it. General Westmoreland had found this system cumbersome as he attempted to make B-52 support more responsive to changing battle situations. Thus, as early as November 1965 he had requested greater decentralization of control of Arc Light strikes. Briefly, in mid-November during the Silver Bayonet action, some of the layering of coordination steps was stripped away: MACV's target nominations went to PAC with info to SAC, JCS, and Third Air Division; PAC requested the SAC strike; JCS approval was assumed if it made no comment. General Westmoreland was anxious that this option be retained and it was. But no situations like the Ia Drang Valley Battle presented itself during early 1966. Arc Light target proposal and approval followed the established pattern, i.e., strike nomination by MACV, approval by CINCPAC and nomination to the JCS, coordination in Washington (OSD, State, and JCS), and execution by SAC forces made by JCS.

It was not until March that approval finally came to institute more simplified procedures, and it followed generally the MACV proposals of the previous November. The JCS delegated approval authority for strikes

in South Vietnam jointly to SAC and PAC.* These strikes would be conducted within a monthly sortie rate established by JCS; strikes in excess of this rate would require JCS approval; and JCS would receive an information copy of the strike planning message and the execution message.

One particular phase of the overall process of mission planning, coordination, and execution which MACV believed could be still further improved was the reaction of the Guam force, that is the time from receipt of target information to the time over target. In June 1965 this time had been set at 24 hours, and remained unchanged through the first ten months of operations, except during the Silver Bayonet action when B-52s released on target 15 hours after receiving the initial request. But 15 hours was too long for some targets. COMUSMACV emphasized the direct correlation between timeliness and effectiveness. B-52s must be available to act on the most up-to-date intelligence, especially during ground operations. In early May MACV warned CINCPAC of the possibility of an enemy offensive under cover of the coming southwest monsoon (May through November) and presented his proposals for countering it. Additional B-52 "spoiling raids" would be necessary and he emphasized timeliness: "There is no question but that maximum effectiveness from these raids can be realized only when there is minimum time between detection of the threat and TOT." Specifically, MACV wanted

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As might be expected, strikes in Laos and North Vietnam required more extensive review and approval; for example, before striking a target in Laos the approval of the U. S. Ambassador to that country had to be secured. The JCS still ordered execution of "out-country" targets.

six B-52s to be over a given target seven and one-half hours after strike initiation. The means he suggested to improve timeliness were airborne diversion of bombers and ground alert at Guam. Airborne diversion could be achieved by SAC using the AN/MSQ-77 Bomb Directing Central Radar.* This equipment, in the process of being located in South Vietnam, could redirect the B-52s in flight from a preplaned target to another which latest intelligence showed to be more lucrative. Acceptable as a first step would be a 10 hour reaction time. This could be achieved by placing the six bombers on ground alert. They could then be launched with a minimum of briefing and target study.

Strategic Air Command, despite its preference for a preplanned program, was prepared to take whatever steps were feasible to make its Guam forces more responsive to MACV's requirements. Both Headquarters SAC and Third Air Division analyzed the situation and prepared proposals. On 9-10 June representatives of SAC, MACV, and PACOM met on Guam to confirm details. The Quick Reaction or QR force would consist of six aircraft with a reaction time of 10 hours from receipt of a strike request. Aircraft would be on ground alert with pre-flight complete. The MSQ-77 bombing system would be used to direct the bomb run and release from the ground. All B-52s in the QR force would have the transponder beacon installed. The QR force would have the capability of striking an alternate target if the MSQ-77 facility failed to effect a release. MACV would

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This equipment was formerly designated AN/MSQ-35 Radar Bomb Scoring Central when in use by SAC on its Radar Bomb Scoring Express trains. The designation was changed in April because of the combat use being made of the equipment.

designate a target area for this purpose. The QR force would be reconstituted within 12 hours of a launch. No launch would be scheduled within 2 hours of a regular Arc Light launch. Only one mission would be executed between scheduled Arc Light missions (approximately 24 hours). Minimum time between QR launches would be 16 hours.

Effective 01/0001Z July the six B-52s of the QR force were ready for operations. The force was first used on 6 July in support of the First Air Cavalry Division (mission Pink Lady).

The Quick Reaction Force was a beginning, but only that. CINCSAC was prepared "to take the initiative" in suggesting to MACV and PAC other ways to improve reaction time and in early September he directed his staff to work it out. The increase to 50 bombers planned for early November certainly gave planners greater latitude for enhancing the flexibility of Guam forces. SAC told PAC on 15 September that it had plans for inflight diversion to another target of a portion of an airborne force. This command proposed a meeting at Guam for a discussion of its ideas. At the meeting held 28-29 September SAC presented three methods of enhancing the tactical flexibility of its 50-bomber force:

1. The six aircraft QR force already in existence.
2. Airborne diversion of three aircraft (last cell) anytime up to that time during the mission when the MSQ bombing procedures took over.
3. Use of the regular preplanned daily force as a QR force by changing it to a MSQ bombing force if notified not more than 9 hours prior to scheduled time over target (same timing as the QR force).

The conferees accepted these proposals.

Strategic Air Command was ready to put into operation on 1 November the recommendations it had made at the Guam meeting. An additional flexibility feature was desired by JCS, however. Increasingly anxious over improved North Vietnamese air defenses, it wanted the capability to divert an entire airborne B-52 force to an alternate target when last minute information showed danger of interception by surface to air missiles if the primary target was attacked. Procedural arrangements proved not difficult and by late October SAC had completed its staff work. They were then approved by PAC and written into its basic operations order for Arc Light.

Thus, by November 1966 greater operational flexibility options for the B-52 contingency force took the form of the Quick Reaction force; inflight diversion of a single cell (IDC) to an MSQ directed target; ground diversion of an entire preplanned mission (GDM) to an MSQ target, if notification was received three hours prior to takeoff; and diversion of the entire airborne force (IDM) away from a sensitive SAM defended target to an alternate. This capability was being used only sparingly, however, at the end of the year.

The greater flexibility of the Arc Light force was made possible in large part by the deployment to Southeast Asia of ground radar equipment which directed bombers to the target and actually ordered the release of ordnance. This equipment, the AN/MSQ-35, came into general use by SAC B-52's during the last half of 1966, although tactical air began using it earlier in the year.

The dense forest cover of South Vietnam and the general lack of well-defined cultural features provided few good offset aiming points for use by the B-52s. As already mentioned, during the early months of Arc Light operations SAC made extensive use of the pre-positioned radar beacon transponder. Usually installed on a hovering helicopter, the beacon sent out a pulsating signal which was recorded by the bomber's bomb-navigation system and used as a precise offset aiming point. This tactic, known as Wet Snow, was satisfactory but the equipment was limited in range and vulnerable to enemy attack. Much more promising, with greater range and accuracy, was a ground radar installation operating in conjunction with a transponder equipped aircraft.

The AN/MSQ-35, manufactured by the Reeves Company, was a pencil beam acquisition radar. Pre-positioned on the ground, it would operate in conjunction with transponder installed in the aircraft. In essence, the ground radar would track the bomber by means of interrogating the shipboard transponder, guide it to the proper point of release in relation to the target, and order release of bombs. The equipment weighed about 75,000 pounds and was contained in four wheeled vans which were transportable by air. It could be moved by three C-133s to areas where some type of roadway system existed and then trucked to final destination. The original equipment, as taken from the SAC bomb scoring system and adapted to this use, could track aircraft to approximately 100 nautical miles through use of the transponder beacon or up to 50 nautical miles by skin paint only. However, through modification the radar-transponder response was doubled to permit tracking and direction to within about

200 nautical miles. The entire system could be placed on a hardstand of a 100 feet x 100 feet dimension, and since it contained its own power system, needed only communications facilities.

Experimental work and training on guidance of aircraft from the ground, including dropping bombs and scoring of effectiveness was conducted by SAC on unmodified equipment during the last half of 1965 under Operation Big Inch. The command did not at first visualize the MSQ-35 as the primary means of bombing direction, but rather as an alternative when no geographic offset aiming points existed. Also, it cautioned that relatively secure locations would have to be found for the equipment. By early 1966 CINCPACAF had been told by USAF that one MSQ-35 plus crew could be deployed and it asked SAC to supply the list of personnel. SAC said deployment could be accomplished 15 days after receiving orders, but only if a sufficiently high priority was assigned to the project. Also, the question of feasibility still existed since site surveys had to be made prior to movement of the equipment. To prepare for a possible short notice deployment, SAC established a team to conduct the necessary surveys.

In late January 1966 CSAF directed that the survey team be sent to Vietnam at the earliest possible date, and arrangements were made for departure of a group from SAC and the 1st Combat Evaluation Group (1CEG). However, the decision to utilize this system in Vietnam was not delayed until the results of that survey were available. On 26 January the Air Staff was briefed by SAC on the results of its tests and training and on how the equipment could be used. At the same time

a USAF conference was held and MSQ responsibilities assigned. Second Air Division would have operational control. Equipment and personnel were to remain under SAC ownership, and personnel would be on temporary duty. Logistics, supply and maintenance were also SAC's responsibility.

If there was any question of the need or the desirability of the USAF supplying additional assistance for close air support it was answered by PACAF's commander, General Hunter Harris at this time, the end of January. He told General McConnell of a survey which reported that "the Marines are satisfied with the ground forward air controller [FAC], while the Army is happy with the airborne FAC . . . both . . . are highly satisfactory in quality, timeliness of response and in producing the effects desired." However, General Harris said that for all-weather support even the Navy had stated that the Marine's TPQ-10 radar was "significantly less accurate than visual close air support missions and should normally be used in an area bombing role." This left only the FACs to provide guidance in close quarters, and their capability was limited in either adverse weather or in night operations. USAF just did not have a suitable alternate method in SEA for controlling target coverage in the unique situations that had developed there.

The survey team reported that both Bien Hoa and Pleiku Air Bases could be used, particularly if the MSQ with a 200nm range became available. It also recommended that a third installation be made at Nakhon Phanom, Thailand, to give coverage of northern Laos and Vietnam to the 17th Parallel, although they did not visit that location. SAC

asked PACAF to decide where it wanted the first set to go. This decision was necessary as USAF authorized the 1CEG to deploy one MSQ-35 with its associated supplies, equipment, and personnel in late February. A second system was requested to be in place about mid-April. USAF then directed Oklahoma City Air Materiel Area to start modification of 82 B-52Ds by installation of the transponder.

Bien Hoa Air Base was chosen as the site for the first MSQ-35 (Sky Spot One), and on 1 March the first of three aircraft carrying the equipment landed. By 7 March a checkout was attempted but not completed due to target drift, but it was accomplished the next day. By 10 March map accuracy and coordinates had been verified. On 19 March 24-hour a day, 7-day a week activity started. Sky Spot One (Operating Location 21) was used to direct TAC fighter aircraft under surveillance of Second Air Division forward air controllers. The results were reported as excellent, even though tracking was limited to skin painting only because the TAC aircraft did not have transponders installed as yet. Four more MSQ sites were established during the rest of 1966. The Bien Hoa installation was followed by one at Pleiku Air Base, operational on 22 April. The third was in Thailand at Nakhon Phanom on 3 June, while the next two were in Vietnam, at Dong Ha, on 30 June, and Dalat, on 21 September.

The 100 mile capability gave the possibility of MSQ control over most of South Vietnam. Extension of these control areas to 200 nm through modification of the MSQ-35 to the MSQ-77 was the second phase of the Sky Spot Plan. The Reeves Company modified one MSQ-35 to the longer range version. Tests during March and April 1966 in Louisiana

and Texas, using TAC aircraft, proved the usefulness of this version and the first model was sent to SEA at the end of June. It became operational in July at the Thailand site. Modification of the other three sites from 100 mile to 200 mile range was accomplished in the field. Bien Hoa was finished 4 October, Dong Ha on 5 November, and at the end of the year the site at Pleiku was still in the process of being changed.

When the Bien Hoa site was declared operational MACV placed a limit on the range from friendly forces that it could be used: 1000 meters (0.62 mile) unless the ground commander approved a shorter distance. This limited use of the control system to area saturation bombing down through direct air support, but did not permit use for close air support in most cases. This limitation was explained as being required due to the inability to control the bomb drops with pinpoint accuracy. However, even the early drops had showed a circular error probable of less than that. In July, for example, PACAF reported the control of four attacks by F-100 aircraft with a 50 percent CEP of 250 feet, 75 percent of 266, and 90 percent of 371. The largest miss was 750 feet. Thus, PACAF felt that possibly the limitations were too restrictive, particularly since post-strike photography and eye witness accounts indicated that many missions "have been spectacularly successful." Of course, there were some spectacular misses also, such as one of 30 miles due to computer error, but these were few.

There were some operational problems as was to be expected in a completely new system. One item was over-interrogation of the

beacon that had developed, and it was considered that there were possibly several sources of X-band radiation which could cause this, and a change from single to double pulse interrogation frequency was considered. The antenna on the B-52s needed further engineering work to raise efficiency and prevent the masking that occurred in certain turning actions. A better flow of information to the Sky Spot controllers was also needed to keep them informed on inter- and intra-cell structure. One other limiting factor was the operational fact that one station could only control one flight at a time, and then 10 to 15 minutes were required to acquire and control the next one. However, the overlapping of control areas, in addition to providing back-up in cases of outage, gave an additional capability in most of the area.

On 1 July the Quick Reaction Force of B-52s was activated by SAC to permit putting six bombers over a target nine hours after receiving a request. As mentioned earlier, the first of this force was on 6 July, and this was also the first use of the MSQ-77 guidance system by B-52s. During the last half of the year Sky Spot, later Combat Proof, directed bomb release on 84 B-52 missions (663 sorties). The CEA was 1004 feet, and the CEP 700 feet. It appeared that this ground directed bombing method was proving its usefulness.

The use of ground directed bombing and the other flexibility features developed during 1966 promised to make B-52s more responsive to COMUSMACV's requirements as the magnitude of the Arc Light operation increased. It will be recalled from our previous discussion that by the end of 1965 General Westmoreland, now in possession of more targets

than he had B-52s to strike them, urged an increase in the sortie rate. He wanted 450 sorties a month at the beginning of 1966, 600 during April through June, and 800 thereafter. Secretary McNamara supported this call for greater effort. Two problems stood in the way of an immediate increase, however. CINCPAC said that munitions shortages was the major one. Also, Guam would not be able to accommodate the additional B-52s required for 800 sorties until August. Facilities for the 70 bombers needed were scheduled to be completed at that time.

In the number of sorties actually launched, in no month during the first half of 1966 was even the 450 level achieved. In the middle of January the JCS programmed a total of 750 sorties for January and February, with ten percent of these to carry the BLU-3 bomblet. Problems with the dispensing system for these munitions developed during the last month of 1965 precluded their use, however, during the early months of 1966, so a somewhat low rate was accepted. During the next four months stocks on Guam were sufficient to support 450 sorties (400 high explosive and 50 bomblet), but less than that figure were actually approved and flown: 435 in March, 420 in April, 414 in May, and 399 in June.

CINCPAC's programmed allocation of munitions did not in fact provide for an improvement in this situation until late in 1966--the 450 rate would be flown through October and 600 a month in November and December. By July 1966 the JCS was planning finally to achieve the 800 rate in February 1967. MACV's plan was to use 600 high explosive and 200 bomblet sorties. CINCPAC, with SAC's recommended loading in hand,

suggested that the sortie level might be scaled down since B-52Ds were capable of carrying increased numbers of bombs.

MACV resisted any lowering of its requirement, however, and said that the 800 rate had been based on the estimated enemy threat transposed into targets. MACV acknowledged that sortie requirements emanated from and supported future planned operations, but the sortie level should not be based solely on the availability of predicted targets. It must be flexible enough to meet unexpected increases in enemy offensive and defensive military operations. A maximum bomb load (which for the D's was 108 MK-82s) did not necessarily mean an increase in the number of targets capable of being struck or a decrease in the number of aircraft required; it meant greater flexibility in the amount of ordnance to achieve the desired result. MACV said that there had been a substantial increase in the number of target requests coming in from field commanders, an expression of growing familiarity with and increased confidence in B-52 support. It had been difficult therefore to sustain the bombing of Viet Cong base camps in War Zones C and D, because urgent target nominations during ground operations (for example, Operation Hastings) took priority. The 800 sortie rate would, according to MACV:

> . . . allow degree of flexibility necessary to support directly ground troops with QR [Quick Reaction] force and still provide additional sorties for preplanned . . . operations. Sustained campaign must be conducted in War Zones, restrikes could be executed against revalidated targets, and additional enemy LOC [Lines of Communication] resources in Laos could be attacked. Anything less than 800 per month necessitates use of priority system which decreases overall effectiveness and capability of Arc Light program in COIN [Counter-insurgency] situation.

After considering these arguments, CINCPAC amended its calendar year 1967 munitions request to reflect the 800 sortie rate, but because production of the Hayes Dispenser system would not support all the bomblet sorties requested, high explosives would have to be substituted for all but 75 of them. Slippages in munitions production were a problem of continuing concern, but by early November PACOM was confident that it could support the 800 rate in January. The final Secretary of Defense decision on the matter (SEA Deployment Program No. 4) moved the date up a month. Augmenting SAC forces would deploy during January and be ready for expanded operations by 1 February. On 19 December CINCSAC decided to add 11 B-52s from the 461st Bomb Wing (it already had three on Guam) to bring the total force up to 61 bombers. This number was sufficient to accomplish the desired sortie rate.

At the same time that the 800 rate was being discussed in the late months of 1966, a more modest increase in operations, to 600 sorties a month, was approved and begun. In September the JCS approved such a rate for November. SAC would use 50 bombers: two squadrons acting as cadre units and augmented by aircraft from other B-52D units would be sent to Andersen AFB during the regular October changeover. Deployment of the augmenting force of 17 aircraft was to have taken place between 17 and 27 October, but because it coincided with President Johnson's trip to the Far East and might, as the JCS described it, cause "political repercussions," the movement was ordered delayed. The aircraft were subsequently moved during the first two weeks in November, but this also meant a delay in achievement of the increased sortie rate to December.

When increased operations did begin the rate would be 50 sorties greater because of the personal initiative of Secretary McNamara. During a trip to the Pacific in mid-October, he stopped at Guam. During briefings on the Arc Light operation, the capabilities of the old 30 aircraft force were compared with the new 50 force level. The Secretary asked if the larger force could fly 650 sorties a month. The Third Air Division commander said yes. As a result, CINCPAC readjusted its air munitions allocation for Arc Light, and after SAC confirmed it was ready, the 650 sortie rate became effective 1 December.

The year 1966 then was one of increased B-52 operations in Southeast Asia. Consider the first six months of the year. Twice the number of missions were flown during this period as were flown during the last half of 1965. It was true that the frequency of the missions increased and the number of aircraft per mission was generally fewer (as few as three and as many as 30 bombers per mission, but 12 to 15 was the most common number). This in part explained the increase, but there was also a definite acceleration of effort. In sorties launched, a more accurate gauge of activity than mission totals, the increase was 753. There was also a greater variety of weapons carried and heavier tonnages delivered, although the maximum capacity of the B-52D was not fully realized until later in the year.

The nature of the bombing program also changed, and this was the direct result of an increase in the amount of intelligence and an improvement in its accuracy and timeliness. More often now, intelligence

was received of a particularly worthwhile target which had to be struck quickly for maximum return. These were usually enemy troop movements or concentrations. Previously planned missions were then delayed while the "fleeting" target was struck. Yet, there was no change in the total emphasis during the first half of the year. The VC encampments (food and arms storage, headquarters elements, local and provincial communist party headquarters, training centers, communications, etc.) remained the chief target of SAC area bombing. More frequently now, additional raids were called in against targets previously hit or in areas immediately adjacent to prior targets. Also, restrikes were calculated to deter the VC from filtering back into bombed areas, and as such were part of a long term psychological campaign.

Only twice before had SAC provided direct support to U. S. ground troops in South Vietnam (Operations Silver Bayonet and Harvest Moon have been mentioned earlier), but during the first part of 1966 such support became common. B-52s supporting search and destroy operations served the ground forces as long range artillery, hitting suspected enemy strong points and reported concentrations of troops, and thus permitting the enemy little opportunity to oppose our forces in mass.

A combined effort of B-52 strike and immediate ground exploitation was particularly effective early in January. On the third, 18 B-52s (mission Dry Dirt) hit a suspected VC storage area in War Zone D near Phuoc Vinh. Troops of the First Infantry Division then conducted a thorough sweep of the area (Operation Quick Kick). Their most significant find was over 1400 tons of rice, which was destroyed by burning

and dumping in a nearby river. But the air bombing's main contribution was that it opened the jungle for easy access by the infantry. Noted by MACV in its report of the operation was that the large rice cache had not been discovered by BDA photography. This tended to give credibility to the argument that ground exploitation provided the most accurate assessment of Arc Light mission results.

Restrikes also assumed greater importance in the base areas like War Zone C. These were carried out in conjunction with a continuing psychological warfare program. In general terms, the program was designed to frustrate VC attempts to establish themselves once again in previously bombed areas. The "stick" of bombing was applied alternately with the "carrot" of leaflet drops suggesting strongly that they return to government control.

What must be counted as one of the most unusual uses made of B-52s in South Vietnam came in late February. MACV asked SAC to deliver incendiary bombs in a test of the feasibility of destroying the jungle cover in the Chu Pong Mountain area in Pleiku Province.* This method of exposing the enemy to observation and hence destruction had been tried before (Operation Sherwood Forest in March 1965) but without much success. This particular test was under the overall direction of OSD's Advanced Research Projects Agency (ARPA) unit in Vietnam. The plan was to first

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* It will be recalled that the Chu Pong Mountain was the site of several B-52 missions in support of the Ia Drang Valley battle in November 1965. It remained an enemy stronghold.

dry out the jungle by applying a chemical defoliant and then set it ablaze with an incendiary raid. By early March the defoliant had been applied and the foliage thought sufficiently dry for ignition. There had been no rain for five days and the weather was forecast to remain dry. MACV ordered the 15 B-52 strike for 3 March. On the day of the raid, however, with the bombers already on their way, the weather in the target area unexpectedly worsened. Thunderstorms were forecast. The mission was then cancelled and the aircraft, now four hours out of Guam, had to return to base. The mission was rescheduled for 11 March. With the weather cooperating, this time it was accomplished. Seventeen B-52s (two ground spares were launched) each dumped 27 750 pound M-35 incendiary clusters (172 tons)* in the target area and returned to base. ARPA termed the test an " . . . outstanding operational success but [a] qualified technical success pending further evaluation." SAC had been on time and on target but the qualification came " . . . because heavy flames were not observed and fire storms did not develop." Sherwood Forest and Hot Tip had not proved the jungle burning technique, but MACV would try again during the 1967 dry season. At least this was the plan in June 1966.

Undoubtedly the most significant development in Arc Light operations during the first part of 1966 was the expansion of the bombings

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The M-35 incendiary cluster contained 57 phosphorous bomblets weighing 10 pounds each. Upon leaving the bomber, and at a preset altitude, the casing burst dispensing the bomblets on the target.

to include targets in Laos and North Vietnam. With a single exception, all B-52 missions during 1965 had been conducted within the borders of South Vietnam. On 10 December the Duck Flight mission hit a suspected VC supply storage area along the South Vietnam-Laotian border. Part of the target box was in Laos. By the end of the year COMUSMACV had expressed a desire to commit B-52s regularly to bomb enemy camps, truck parks, and penetration points on the Ho Chi Minh Trail and on other infiltration routes into the northern provinces of South Vietnam.

The use of B-52s in Laos, no matter how close to the South Vietnam border, could be interpreted as an escalation of the war on the part of the United States, thus it was sensitive politically. Missions during 1966 were not publicly announced, nor were the majority of them cleared beforehand with the neutralist premier of Laos, Souvanna Phouma. Whenever a Laotian target was struck another target in South Vietnam was struck at the same time. The latter one was the only one announced. Although these came to be referred to as "press targets," they were valid targets and not contrived just for that purpose. This arrangement seems to have worked, at least no political problems developed as a result. It would be naive to suggest that the press was actually taken in, or for that matter that it was ever seriously believed that they would be. Yet, perhaps as the result of a tacit understanding, there was little comment suggesting that B-52s were bombing in Laos.

In the first six months of the year SAC flew 399 sorties against Laotian targets contiguous to the South Vietnamese Provinces

of Quang Tri, Thua Thien, Quang Nam, and Kontum (in fact the targets took their names from these provinces, e.g., Quang Tri 9, Kontum 5 and 6, Quang Nam 15 and 16, etc.). The objective of these strikes was to interdict the movement of supplies and men from North Vietnam into South Vietnam. Targets were at various points along the Ho Chi Minh Trail, actually a network of footpaths and roads extending from southern North Vietnam south through Laos parallel to the border with South Vietnam, which at a number of places turned eastward and debouched into South Vietnam. Bombed by SAC were Viet Cong and North Vietnamese troop bivouacs, supply storage areas, truck parks, and road construction crews and equipment associated with this most important enemy supply line. Expended were 7,124.87 tons of bombs (500, 750, and 1000 pounders) and 4,094 canisters of BLU-3B bomblets (320,956 individual bomblets).

As part of this same effort to slow the movement of war goods and men south over the Ho Chi Minh Trail, in April SAC flew two missions against the Mu Gia Pass. It lie on the Laotian-North Vietnam border about 75 miles northwest of the Demilitarized Zone separating North and South Vietnam. MACV reported that in February alone 800 trucks moved through the pass on the important Route 15. It was a natural interdiction point for air attacks, and tactical aircraft had hit it repeatedly, but the work of road repair crews largely negated this effort. Later, in March, MACV recommended two specific targets on the Laos side of the border. It hoped that the saturation effect of the B-52 bombing would not only crater the road, but get some of the repair crews and their equipment as well. An immediate decision was believed necessary because

there were indications that the North Vietnamese might move in surface to air missiles to protect the pass. Should they do so, it would preclude using the B-52s. CINCPAC, while approving targets on the Laos side of the pass, had two "equally important" ones on the North Vietnam side. The rugged terrain and the steep cut and fill construction made the areas ripe for landslides caused by the bombings. SAC agreed the North Vietnam side was the more lucrative target. Although some more consideration was given to hitting one target in Laos and one in North Vietnam at the same time, by early April CINCPAC's planning had focused on a maximum effort of 30 bombers against the North Vietnam side. On 8 April the JCS approved the mission for execution.

Rock Kick III was the first maximum effort mission flown by SAC since October 1965. Thirty bombers and 20 refuelers (weather threatening Kadena had sent the KC-135s to Guam) were launched in one hour and four minutes. Bomber loads were 24 1000 pounders internally and the same number of 750s externally. All bombs were fuzed for subsurface burst and 30 1000 pounders had long delay fuzes. At the target, 29 B-52s released their loads at 35,000 to 37,000 feet. One lost its radar and was not able to drop using an alternate method. In all, 695 M-117s and 694 M-65s were dropped (about 597 tons).

Because it penetrated North Vietnam territory for the first time, Rock Kick must be counted potentially the most dangerous mission for the B-52s to date. Considerable attention was given to enemy defenses along the route and in the target area. Intelligence found no anti-aircraft guns capable of reaching the bombers. No radars associated with

the SA-2 missile were found either, although the bomber's route took them near suspected SAM sites. The mission frag order cautioned that electronic countermeasures were to be used for self-protection only, that is only the aircraft detecting a radar lock-on would take jamming actions. As it turned out, electronic warfare officers were busy during the mission. Twelve aircraft detected Fan Song radars (associated normally with SAM sites), although most of the intercepts were weak. Fourteen anti-aircraft radars were also intercepted. Receiving the most attention from the bombers were lock-ons from unidentified fighters (later determined to be friendly). Five bombers reported fighters near their aircraft. Three of the five dispensed chaff and flares as a self-protective countermeasure; two performed evasive maneuvers; and one, in violation of directives, fired a burst from its guns.

The second raid against Mu Gia occurred on 27 April when 15 B-52s hit target Quang Tri 16. All aircraft released over the target. Dropped were 355 750 pound bombs and 360 500 pound bombs, all with time delay fuzes. Again, Fan Song radars and radars associated with anti-aircraft guns were detected but the signals were weak and easily broken. No fighters were detected during this mission, however.

The Mu Gia raids, especially Rock Kick III, were an impressive display of power. The press, for example, called this 30 bomber mission "the greatest single bombing raid since World War II and the most destructive since the atomic bomb was dropped on Nagasaki . . ." On Rock Kick SAC had indeed dropped the heaviest tonnage of bombs since it had begun operations in 1965. But when one looked past the weight

of effort to the results of the effort, it was clear that the raids had only a transitory effect on the movement of supplies through the pass. While its criticism was muted, MACV left no doubt that it believed Rock Kick was not up to the high performance standard it had learned to expect from SAC. SAC agreed that its bombing had not been up to par on this mission. Troubles with the OAP chosen for final release (it did not show up on the radar scopes as predicted) caused the bombers to make errors of from 500 to 6000 feet. Photos showed that some road cratering had been done in the south part of the target area. The Defense Intelligence Agency found the road cratered in five places, with about 2500 feet of road out. It also estimated that "the damage to Route 15 . . . can be repaired or bypassed within three (3) days." In fact, the North Vietnamese road crews were able to best this estimate by two days.

The question was immediately raised as to whether or not another raid would be profitable. MACV's rationale that " . . . it is most essential that we continue to keep Mu Gia Pass closed, especially throughout the remainder of the good weather period," was eventually accepted by CINCPAC and JCS and another raid was approved. On Big Kite things got back to normal: SAC got better target coverage, the OAPs were easily identified, all aircraft bombed successfully, and Westmoreland sent a congratulatory message. After the early morning bombing, recon photos showed 32 craters on the main road. It remained closed all day, but by the next morning more photos showed all the craters filled in and truck traffic moving again. To MACV, the efforts of the North

Vietnamese to open the pass meant that it was correct in its prediction that the enemy would give high priority to the movement of supplies over the Ho Chi Minh Trail before the monsoon rains came. Our air efforts would have to be equally persistent in keeping the pass closed. To do this MACV proposed a combination of B-52 and tactical strikes to give the enemy no respite in which to repair the damage.

CINCPAC agreed that operations to stop the flow of men and materiel through Mu Gia were important, but he would not approve additional B-52 strikes because of the increased danger from SA-2 missiles. He said:

> Past Arc Light strikes have closed Mu Gia for relatively short periods of time. Results of future strikes probably would not improve this situation significantly. As circumstances stand now, further strikes do not appear justified unless the results can be offset be reducing the threat anticipated.

The Mu Gia Pass was thus declared off limits, at least for the present, still the record of operations for the first year was in most respects an outstanding one. Since June 1965 the Arc Light force had flown against targets up and down the length of South Vietnam, in Laos, and briefly to North Vietnam. During this time, 3,883 bombers released 187,928 armed high explosive and incendiary bombs and 13,445 canisters carrying the BLU-3B bomblet. Predominantly, targets were in Viet Cong base areas and along his lines of communication in places like War Zones C and D. Strikes were in pursuance of COMUSMACV's objectives stated in early 1965: to destroy the Viet Cong command and control system and storage system, to harass him and degrade his ability

to take offensive action, to deter him by taking full advantage of the psychological effects of heavy air bombardment, to destroy his forces, and to support friendly forces engaged in ground operations.

It was increasingly to this last objective that the bombers flew during the last half of the year. By December COMUSMACV estimated that over half of the strike requests came from field commanders. Hence the emphasis already discussed above on decreased reaction time and the ability to divert aircraft from a pre-planned target to one discovered by late intelligence to have more immediacy to the battle situation. In all, 2,910 sorties were effective over the target and they dropped 136,860 armed high explosive bombs and 21,030 canisters of bomblets. These higher tonnage figures are explained in part by the increased sortie rate and part by the beginning of B-52D sorties with full high density loads in October.

During July and August heavy support was given Operation Hastings, a so-called "spoiler" operation by marines and ARVN troops in Quang Tri Province near the Demilitarized Zone. It sought to bring to combat the North Vietnamese Division 324B which had been infiltrating across the DMZ into South Vietnam. These missions took SAC bombers for the first time into the DMZ south of the demarcation line. Further south, in the Central Highlands, SAC supported search and destroy Operations Paul Revere and Henry Clay.

Infiltration through the DMZ continued to be a nettlesome problem. In September for the first time B-52 strikes were approved

above the demarcation line in the so-called TALLY HO operations area (this area eventually came to include the DMZ and about 40 miles north into southern North Vietnam). They were calculated to harass enemy forces and supplies moving south. By late September, however, B-52s began reporting attempts to track them and signals from Fan Song radars, those commonly associated with SA-2 surface-to-air missiles. By the middle of October the Seventh Air Force had identified a suspected site near the DMZ. Then a B-52 mission planned for 19 October had to be postponed when several Navy aircraft reported a missile in flight in the suspected area. The JCS said: "It is agreed that proposed protective measures for this mission would make the risk acceptable. However, because of worldwide publicity in loss of a B-52 to SAM, the JCS agree that this strike should not be before 2 November." As it turned out this particular mission was not re-validated by the end of the year, although other raids within and north of the DMZ began again in December as more evidence became available which led intelligence to conclude that there never had been a site in the suspected area or that it had been moved. Of course there was no guarantee that the North Vietnamese would not attempt to install SAMs near the DMZ, thus very close attention continued to be given to any evidence that might signal their arrival.

November was a month of sharply increased ground activity as the cockpit of action shifted from the northern provinces to the Cambodian border west of Pleiku and to War Zone C northwest of Saigon. Operation Paul Revere IV, begun 18 October by 7 battalions of the 4th Infantry Division, heated up in early November and B-52s were called in

to support the division's battle with major Viet Cong and North Vietnamese army forces. By the end of the month 202 sorties against 25 targets had been flown. Further south in Tay Ninh Province Operation Attleboro began in mid-month as a one battalion search and destroy operation in War Zone C, but it quickly grew to a 19 battalion effort as Viet Cong resistance grew. SAC flew 26 missions hitting suspected enemy concentrations and staging and supply areas north and east of the main battlefields.

A record 659 effective sorties were flown in December. This was the first month of operation by the 50 bomber force on Guam. After a month lapse, B-52s flew 13 missions within and just north of the DMZ, four were in North Vietnam. For the first time since April B-52s returned to the Mu Gia Pass. It was a modest effort, part of a continuing program of harassment of traffic. Twenty missions in II Corps Tactical Zone supported Operations Paul Revere, Thayer II, and Byrd.

It should also be mentioned that covert operations against infiltration routes in Laos also continued throughout 1966, in the last six months 40 missions were flown. It will be recalled that these raids were flown without the official knowledge or concurrence of the Royal Laotian Government. Each time a Laos target was hit another strike was made at the very same time in South Vietnam and announced to the press. The Laos strikes were very sensitive politically, thus they required the approval of the U.S. ambassador to Laos before they could be executed. Hence, the "mortality rate" of proposed targets was high and it was difficult to gain approval to expand the operation or to introduce more flexibility into procedures for target approval.

On the Matter of Effectiveness

In the 18 months from the middle of June 1965 through the end of 1966 SAC contingency forces bombing targets in Southeast Asia dropped 324,329 armed high explosive bombs (500, 750, and 1000 pounders), and to this must be added 459 incendiary bombs (750 pound) and 34,475 canisters of BLU-3B bomblets. During this time 97.9 percent of all bombers launched released their bombs over the target. With this record there was little cause for alarm regarding general weapon system reliability or crew performance. The B-52 then was proving to be a very reliable instrument for dropping high explosive, and the air and ground crews displayed a high order professionalism in accomplishing their tasks. A vast array of statistics have already been marshaled which attest to this. Of course no less a standard had been expected when SAC was called into action, and indeed this was part of the reason it was called. So what SAC had done it had done well. But what had it done? We shall here be concerned with the B-52 in the Vietnam War in terms of how successful it has been in achieving the military objectives set for it. The "fog of war" in Vietnam is of course particularly dense. Thus any evaluation is at best a perilous undertaking, yet some observations can be made based on experience to date.

It is perhaps of first importance to consider the philosophy of the senior military official running the war in Vietnam. General William Westmoreland, COMUSMACV, became convinced early in the program that the heavy bombers had a major role to play in defeating the enemy. After the first raid on 18 June, despite the mission's bad luck

operationally and with little to show in the way of results, he emphasized that the B-52s had filled a tremendous gap in air operations with their ability to lay down a concentration of firepower on relatively large target areas during day or night and in all kinds of weather. To some it might seem that the use of an airplane which for ten years had symbolized our nuclear deterrent strength to drop high explosive on guerrillas was a spectacular piece of military unorthodoxy and expensive out of proportion to expected results. But COMUSMACV was convinced that the cumulative results of such missions, and not necessarily one or even a dozen individual raids, would prove the concept valid. Just the fact that ground troops were able to penetrate areas previously in the sole possession of the Viet Cong was itself significant. He took a very personal interest in the B-52 target selection process (he approved virtually all targets). His communications to SAC concerning its support were always phrased in the most complementary manner. He also made a visit to Guam in June 1966 to talk to bomber crews and to explain to them just how they fitted into the bigger picture of the war. Whether the use being made of the B-52 was compatible with air power doctrine bothered him not. It was the only vehicle that could deliver the massed firepower he needed. Thus in the months to come he would seek an increase in the magnitude of the bombing and greater flexibility in its execution.

The machinery for first selecting a target for SAC bombers and then after the mission determining effects of the bombing was centralized in MACV's Combined Intelligence Center, Vietnam (CICV). Aerial photography,

the historic means of accounting bomb damage, of course followed each mission, but the character of the terrain in South Vietnam and the enemy's tactic of tunneling and underground storage made assessment of real damage from photographs alone unreliable. More than once troops exploiting bombed areas found supplies and facilities that had not appeared in photographs. Mission Top Spin (20 September 1965) illustrates the problem well:

> The target is characterized by dense woods and is in a marsh area. Dispersion of bombs throughout the 1x1 kilometer target box is good. Analysis of the post-strike photography was severely handicapped by the heavy canopy. The only significant evidence of damage visible on the photography is effect of what appears to have been a secondary explosion. There was no general follow-up on this strike. Aerial visual reconnaissance after the strike failed to produce any additional information concerning VC KIA [killed in action] on damage to structures.

Evaluation of strikes in Laos consequently proved difficult because here photography and visual reconnaissance by low flying O-1E aircraft constituted the main means of bomb damage assessment. Reports of Forward Air Controller (FAC) pilots flying over the bombed areas were usually fragmentary and their observations were handicapped by the dense jungle and frequent bad weather. When it was possible to infiltrate special reconnaissance teams (designated Shining Brass) more was learned. Such a team for example examined a twelve square mile area hit by three missions in June 1966. Many structures were found destroyed which had gone undetected by the FACs. MACV emphasized that " . . . ground reconnaissance is the only effective means of conducting BDA on this type of target environment." On the ground intelligence continued to be provided by Shining Brass teams, Laotian road watch teams, and friendly guerrilla units operating along the road network known as the Ho Chi Minh Trail,

although perhaps it was not in the quantity or of the quality that MACV hoped for.

Photography was not a complete waste in evaluating destruction, and indeed in many secure VC areas it was the only method available, but by far the better method was exploitation of the target area by friendly troops. It has been mentioned previously that ground follow-up had at first been considered a sina qua non of B-52 strikes. This goal proved difficult to achieve, to the end of 1965 only about one-third of the targets had been entered by troops. South Vietnamese troops were used, but MACV considered their performance marginal at best. Only U.S. troops could be counted upon to provide thorough exploitation, but during 1965 there were relatively few of them in South Vietnam and they were needed on higher priority missions. Also, many targets were deep in Viet Cong held territory and inaccessible to ground troops. General McConnell explained the problem late in the year. He said that about half of the time when troops did go into a bombed area they found that enemy camps were where intelligence had said they would be and the VC had been hit hard. The other half of the time intelligence was faulty and the camps were not in the target area, or the enemy was not at home when the bombs fell.

The number of ground follow-ups increased naturally as the number of U.S. troops available in Vietnam increased. Continued emphasis was given to improving the quality and quantity of observations made by army troops, but with only limited success. To the end of 1966 reports on less than half of the scheduled exploitations associated with

Arc Light missions had been received by MACV. It was perhaps unrealistic to expect the same insights from infantry as would be forthcoming had trained air intelligence specialists visited the same ground. Usually troops moved hurriedly through the target box and thus information they did provide was many times superficial and incomplete. Reports were also missing because troops sometimes went from the bombed area immediately into a battle situation. Field commanders could be excused then for not always giving the strikes their first attention, in fact the continued emphasis on exploitation brought forth the natural question as to whether B-52s were supporting them or they were supporting the B-52s. Their attitude was perhaps understandable when one considered the time, effort, and manpower it took to walk through the target area at a time when field tactics suggested that areas adjacent to the target box might be more lucrative in terms of encountering the enemy.

After-action reports from ground units exploiting bombed areas were similar in substance and provided: (1) a description of the terrain and of enemy structures found (both above ground and those found underground); (2) effects of the bombs on the terrain and structures and (3) such evidence of effects on enemy personnel and materiel as was found. Troops entering the target area found the landscape torn as if by an angry giant. The bombs falling in neat patterns uprooted trees, shattered them, and scattered them in crazy angles over the ground. The tangled undergrowth was swept aside, sometimes revealing previously hidden field fortifications and openings to tunnel systems. Often the holes blasted in the canopy provided convenient landing zones

for helicopters supporting the troops. Remaining stocks of enemy supplies--rice, salt, clothing, ammunition, weapons, medical supplies, and documents--were either destroyed or confiscated by the troops. Success in finding such stores of supplies, of course, varied from target to target. Sometimes exploitation resulted only in an uneventful walk through the area and little evidence was found that the enemy had actually been there during the bombing. Also rare was evidence of enemy casualties, although reports occasionally spoke of trails of blood, used bandages, a "smell of death" which lingered in the area, and the finding of freshly dug graves. The enemy usually was quite thorough in carrying off his wounded and dead, and he had hours and even days to accomplish this before troops moved in.

An objective of the B-52 bombing campaign equally important as the enemy's supply stores was the continued harassment of his forces and the accompanying psychological effect on soldier morale. COMUSMACV explained this objective like this:

> The war we fight today in Vietnam is a war of the mind as much as of the body. The success of the B-52 raids is to be measured in great degree by the cumulative effect they have on the minds of the VC. The more we strike the VC havens, the less willing the common VC trooper will be to engage in offensive operations. His periods of rest and training will be shortened. He will be forced to move and move again. He will lose a measure of his initiative. He becomes susceptible . . . the raids will help convince the VC soldier that he is not safe anywhere in the country as long as he fights under the VC banner.

It was not possible to add up the effect on morale in the same manner that one could add up captured or destroyed materiel or dead bodies. Because the bombings usually occurred in areas tightly controlled by

the VC, people with knowledge of the raid and its effects were hard to find. Still, with time, prisoners, defectors, and refugees did provide some information of what it was like to be on the receiving end of what one called "chain of thunders." Most discouraging to the VC it seems was the effect of the bombs on their tunnel and cave complexes. Two former American prisoners (U. S. Special Forces Sergeant George E. Smith and Specialist Fifth Class Claude D. McClure) indicated that the VC were more afraid of B-52s than fighter-bombers because their massed destructive power penetrated the jungle cover for full ground detonation. MACV said that delayed action fuzed bombs had been effective in collapsing tunnels and bunkers which extended to a depth of 30 feet. A Rand study based on interviews in South Vietnam said:

> The devastation caused by B-52 attacks to VC underground structures and to vegetation was reported by interviewees to have made a profound impression on both the VC and the civilian population. Refugees and VC soldiers from areas attacked by B-52s were unanimous in stating that the depth of the bomb craters and the size of the uprooted trees led them to conclude that their shelters and tunnels could not protect them against such attacks. For example, a Main Force squad leader from Zone D reported that the raids destroyed tunnels 3 to 6 meters underground [10 to 20 feet] and that this had adversely affected his unit's morale. Villagers in attacked areas tended to leave in large number for GVN-controlled towns . . . The impact of the B-52s was further heightened by the surprise effect of the attacks.

The Viet Cong of course took measures to mitigate the effects of the raids--more frequent movement, wider dispersal when in bivouac, and deeper tunnels. But perhaps the most realistic response to the B-52 was explained by one Le Van Son, a former platoon leader: "All of us, including our superiors, have been instructed to run as soon as we heard the roaring from the high sky . . . no matter how deep the tunnels."

Or consider the plight of Nguyen Van Va, a former assistant platoon leader. He was bombed by B-52s six times in November and December 1965 and in January 1966. In the second bombing his regimental CP was hit and 12 killed. Underground trenches did not prove strong enough to resist the bombings so the L shaped trench was used by his unit. The entrance to the trench was covered by thick lumber and a coating of about one meter of soil added. Then there was Le Van Tram whose unit was hit in the Boi Loi Woods as it was transporting supplies. After the raid only 118 of 250 men were left. The experiences of these former VC caught under B-52 attack may be considered typical of the effects the raids were having on the organization and morale of the VC forces. General Maxwell Taylor, former ambassador to South Vietnam, provided an interesting commentary on this part of the B-52 campaign:

> I think they [B-52 strikes] have been very effective in keeping the Vietcong moving. In the good old days . . . it was possible for a Vietcong battalion to get into a fight, have a good brisk one for 2 or 3 days, then break off and go back into base areas where that battalion was relatively secure; in fact, it was completely secure. It could train, rest, recruit, and prepare for the next operation.
>
> The B-52 strikes now have been used on a scale supported by, I think, reasonably good intelligence with the result that no battalion is ever secure. We find from prisoners, they complain about the fatigue, of constantly moving for fear of a B-52 strike, and from that point of view . . . they are effective.

And from the Viet Cong themselves came a cryptic statement (in a captured document believed to be an annual report of the Viet Cong Military Region 7 activities . . . for 1965): "In the second half of 1965, the major ideological weaknesses attentuated, but there was some evidence of reluctance of performing missions for fear of B-52 aircraft . . ."

To the general objectives of destruction of the enemy command and control and supply systems and the harassment and psychological disruption of his troops was soon added another as increased U.S. troop strength in the country permitted offensive operations against the enemy to begin--direct and indirect support of combat operations. SAC support of this nature began with the Ia Drang Battle in November 1965 and by the end of 1966 over half of the strike requests came from field commanders. When considering the bombing schedule, first priority went to these strikes and usually required the B-52s to be over the target in a minimum amount of time, hence the emphasis on reduced reaction time by MACV.

Technological development provided United States forces in Vietnam with firepower in enormous quantities, and its lavish use amazed even knowledgeable observers. The use of firepower was explained by General Moshe Dayan, who visited Vietnam in the fall of 1966:

> The Americans carry out their counterattacks and 'pursuit' in the jungle not with infantry but with firepower. The artillery and the Air Force are summoned to bombard an area as soon as it is shown to be holding enemy troops . . .
>
> The problem faced by an American infantry unit engaging the Vietcong is not how to storm the enemy positions but how to discover where they are. The 'storming' and 'assualt' will be done by the 155s and aerial bombs. These are not restricted to jungle paths and are not vulnerable to ambush.
>
> The most effective weapons the Americans have for this function are their heavy bombers and they can operate no matter what the weather or visibility.

Major General L. W. Walt, Commander of the Third Marine Amphibious Force, described B-52 support of Operation Harvest Moon "awesome to behold"

and said that as a result "The enemy has abandoned his prepared positions and much of his equipment in great confusion, and this is making our part of the job easier." Reporting on another Arc Light strike in support of marines west of An Hoa in January 1966, Walt said: "The tremendous shock effect permitted unopposed helo landings within the strike zone." Also emphasized was the timing and precision of the raids. The commander of the Fourth Infantry Division said that he observed a bomb drop from the air during Operation Attleboro: " . . . you could visualize a huge domino on the ground--the explosions on the ground moved up and down within the domino in a remarkably compact pattern." Brigadier General Ellis W. Williamson, commander of the 173rd Airborne Brigade said he had observed several dozen B-52 strikes and " . . .[it] comes in right at the appointed moment and it hits exactly where we asked it to. They're accurate. They're extremely good."

From after action reports of U.S. field commanders it was possible to get an appreciation of the effect of B-52 bombings on VC forces which opposed U.S. troops. In June 1966 the 101st Airborne Division's critique of Operation Hawthorne said: "Perhaps the greatest lesson learned . . . was the effectiveness of the B-52 in a direct support role when used against targets that have been identified by accurate intelligence and when the area is immediately exploited by ground forces . . ." Commenting on a 13 June strike, the commander of the 502 Parachute Infantry emphasized the shock effect on the enemy:

> The damage, in places, resembled that which could be expected from a low yield nuclear weapon . . . Of special significance is the fact that the 2nd Battalion 502nd Infantry suffered no friendly casualties subsequent to, and

> in the area of, the strike during the period 13-18 June (final phase of the operation . . . U.S. troops moving into the target area found NVA soldiers still wandering around in a state of shock and offering little if any resistance. In the six days between 13-18 June friendly forces were able to thoroughly and systematically search the enemy positions following the B-52 strikes.

The Fourth Infantry Division was able to use the destructive power and shock of the B-52's firepower to penetrate strong enemy positions during Operation Paul Revere IV:

> Enemy forces withdrew west across the Nam Sathay River, and we encountered them in strength in well dug-in positions . . . Because of the restrictions on our ability to maneuver, initial contacts with these positions made it obvious we would take heavy casualties if we tried a direct attack. Accordingly, we called for a series of Arc Light strikes to assist our maneuver.
>
> After the strikes we went back and found enemy resistance still heavy and discovered a series of bunkers in front of the area which had been struck. These bunkers became apparent as a result of the bombing . . . We backed off, asked for strike BRAVO 51, and again moved in on the enemy position and found that it had been vacated.
>
> There is no question but that the Arc Lights [sic] forced the enemy back across the border and saved us many casualties. I can assure you that the infantrymen who had to close on these positions . . . appreciate the splendid support you have given us.

Perhaps Major General F. C. Weyland, Commander of the First Field Force during Operation Attleboro summed it up best when he said:

> These B-52 strikes are of incalcuable value to the infantry. They do tremendous damage to enemy installations and base facilities; they destroy enemy fortifications; and most of all they constitute a Sword of Damocles over the heads of VC field commanders that must enter into any of their plans that would call for massing units preparatory to a large scale attack.

It seemed to be also a matter of firepower being available and therefore used. Consider the statement of Major General Weyland: "We had wonderful luck with the B-52 strikes . . . used them like close air support or long range artillery." And when did an infantryman ever have enough artillery support? If the bombing smothered any VC resistance which might threaten, and thereby reduced U. S. casualties, boosted troop morale, and made reaching the objective easier, field commanders were naturally grateful and encouraged to seek B-52 support again in similar situations. General William Momyer, himself critical of any increase in B-52 effort, said that it was ingrained in a soldier's thinking to put suppressing fire on any suspected target. His (the soldier's) attitude was that if the enemy was in the target area, the fire neutralized, deterred, or knocked him off balance. If the enemy wasn't in the target area, the firepower used was still a small price to pay for tactical security. While this kind of targeting philosophy might be antithetical to an airman's thinking, it could be, as General Momyer said," appreciated and understood." It was also true that the army was running the Vietnam War.

To conclude, it seems reasonable to suggest that the main contribution of the B-52s to date in Vietnam was the constricting effect the bombings were having on the enemy's freedom of movement and action. Some appreciation of the damage done to his base areas had been gained by troops exploiting the target areas. Yet it would be misleading to draw the conclusion for the examples cited above that in all or even a majority of instances the strikes had been equally satisfactory. To

the end of 1966 the majority of the target areas remained unexploited thus only rough estimates of losses in dead and materiel destroyed could be made. Emphasis then focused on the psychological effect on the enemy of being bombed, or what was perhaps almost as disturbing, the threat of being bombed, and its debilatating effect on enemy plans for major operations. If the Viet Cong and their North Vietnamese allies could be prevented from massing their manpower, friendly forces could retain the tactical initiative. This kind of total pressure, for which the B-52 was uniquely qualified by virtue of its all weather capability, was calculated then to hurt morale and hence destroy the cohesion of the enemy's organization. To the end of 1966 success in this endeavor had been modest but encouraging.

Summary

About ten percent of SAC's B-52s were committed to contingency operations at the end of 1966; the force had almost doubled in size and the sortie rate had risen to over 600 a month in the 18 months of operations from Guam. A further expansion was planned for early 1967, and it seemed reasonable to predict that such augmentations would cease only when all conventionally modified B-52s had been drawn into the Vietnam War. The expansion of construction at existing bases and the consideration of other bases closer to targets in South Vietnam seemed to suggest a long term commitment. The rationale at higher governmental levels for this seemed to be a willingness to give COMUSMACV every possible advantage to help him bring the military phase of that conflict to a satisfactory conclusion. SAC expressed no official opposition to

this policy, but it did evidence concern over the long term effects on the Single Integrated Operational Plan of the continuing and seemingly open-end commitment of heavy bombers. The point was that General Westmoreland's requirements could not be satisfied indefinitely without accepting a corresponding weakening of the nuclear war plan.

B-52 operations were restricted to South Vietnam and the border areas of Laos and North Vietnam where there was little danger of interception by North Vietnam air defenses, especially surface-to-air missiles. The U.S. Government remained acutely sensitive to any possible situation in which a B-52 could be lost to a SAM missile, because such an event would represent a substantial propaganda victory for Hanoi. Thus tactical fighter-bombers continued to attack the few targets in North Vietnam with some claim to being strategic (although some were still untouched as a matter of policy) and strategic bombers acted in the role of tactical battlefield support. It might matter to doctrinal purists that B-52s were being used by COMUSMACV much in the manner of heavy artillery, hitting those targets his 155s could not reach, or as tactical aviation in an interdiction role and in direct support of troops. But those who contended that the B-52's role in Vietnam was entirely proper emphasized the versatility and flexibility of the weapons system in other than nuclear operations. A Navy man made this point most succinctly. Vice Admiral H. G. Rickover told the House Subcommittee on DOD Appropriations in May 1966:

> Our weapons are used to the greatest effectiveness possible under the circumstances in which they are employed. This often means using them for an entirely different mission than that for which they were designed. For example, look at the use of B-52's in Vietnam today. Every major weapon system should be designed with the maximum possible inherent flexibility.